Beyond the Future of Cardiovascular Imaging: Opportunities and Challenges
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Welcome message

From the President of the ASCI

Dear Colleagues and Friends,

On behalf of the ASCI, it is my great honor and privilege to welcome you to the 14th Asian Congress of Cardiovascular Imaging (ASCI 2021) which will be held in a virtual form at ALMAZ Center, Hanoi, Vietnam, from Thursday to Saturday August 19th to the 21st. Hanoi is the capital city as well as the second-largest city of Vietnam.

The ASCI Congress is held every year. It had been held twice in China, Japan, Korea, Singapore, and Taiwan, respectively, and once in Hong Kong, Malaysia, and Thailand. In addition to the congress, the ASCI has been playing a significant role in the education of Asians. Accomplishments of ASCI include the publication of an official journal called the CVIA, the ASCI Cube program which fosters young and intelligent ASCI members, the ASCI Joint Symposium which supports the academic activities of the Asian Oceanian national societies, Cube Alumni, Practical Tutorial Training which trains ASCI members in clinical practice for cardiovascular imaging, LIVE-Tutorial which is an online lecture, and the ASCI Speaker Bureau which trains ASCI members to become distinguished speakers in academic communities.

The theme of ASCI 2021 is “Beyond the Future of Cardiovascular Imaging: Opportunities and Challenges.” The congress will provide inspiring refresher courses and updated scientific programs, including the implication of AI in cardiovascular imaging. AI has the potential of transforming cardiovascular imaging in the future. It will help radiologists, cardiologists, and healthcare providers to reduce diagnostic errors, facilitate collaborations among physicians for the sake of precision imaging, and promote preventive patient care. It is ASCI’s privilege to collaborate with sister societies, including the EACVI, ESCR, NASCI, SCCT, and SCMR. Outstanding speakers from those sister societies are invited to strengthen the scientific program.

Due to the global pandemic, international professionals of the healthcare industry are cordially welcome to join the virtual meeting.

I would like to extend my sincere appreciation to the Congress President, Prof. Hoang Minh Loi, and the LOC members of ASCI 2021, for organizing this extraordinary congress. I would also like to take this opportunity to thank all participants, speakers, moderators, officers, and EC Members of ASCI, as well as the industrial sponsors for promoting the advance of cardiovascular imaging and the forthcoming success of the ASCI 2021.

Sincerely,

Yung-Liang Wan, MD
President of the ASCI
Honorary Professor of Radiology Linkou Chang Gung Memorial Hospital
College of Medicine, Chang Gung University, Taoyuan City, Taiwan
Welcome message from the Congress President of ASCI 2021

Dear Colleagues and Friends,

It has been a great honor to cordially invite you to the 14th ASCI Congress organized by the Asian Society of Cardiovascular Imaging.

On behalf of the Local Organizing Committee, I would like to thank you for your interest and participation in the Virtual ASCI Congress 2021. This year in Vietnam, many asiatic countries and over the world overcoming the difficulties of the COVID-19 pandemic, we must hold the ASCI Congress totally online combine between ASCI and VSRNM, between VSRNM and Vietnam National Heart Association (VNHA).

In a recent year, technological developments in cardiovascular imaging have infiltrated every aspect of practice, with noticeable improvements in diagnosis and impact on patient management. All imaging technologies have undergone continuing improvements, and thus, imaging has become essential in both clinical practice and research. The theme of ASCI 2021 is “Beyond the Future of Cardiovascular Imaging: Opportunities and Challenges”

With the current Covid-19 pandemic, everyone should get used to the new normality. We hope this virtual congress will give you and other eminent Professors and Doctors from all over the world the opportunity to share knowledge and to exchange experiences in the field of cardiovascular imaging.

Together we have built an agenda include inspiring educational courses and sensational scientific programs. Gradually get acquainted with the virtual exhibition booths of sponsor companies.

I would like to give my deepest thank to ASCI, SCMR, NASCI, ESCR, SCCT, EACVI and VSRNM, VNHA for your contribution to our scientific program. Thank you, all faculties, chairmen, lecturers have arranged your time to connect and join in our congress. Many thanks, all AO-PO officers, for you devote to success of this congress.

Finally, I would like to send my appreciation to sponsor company (Bayer – Platinum sponsor; Bracco – Silver sponsor; Canon – Bronze sponsor; Philip, Menarini, Circle Cardiovascular Imaging,…) to contribute to the event.

Once again, thank all of you for your participation, and I wish you will have a great time in 3 days of the ASCI Congress 2021. Wish the congress will have successful.

Sincerely yours,

Hoang Minh Loi, MD. PhD.
Congress President of ASCI 2021
Vice President of Vietnamese Society of Radiology and Nuclear Medicine.
# Organization of ASCI

## ASCI Officers

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<thead>
<tr>
<th>Advisory Committee</th>
<th>Tae-Hwan Lim</th>
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<td>Sachio Kuribayashi</td>
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<td>Oraporn See</td>
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<td>International Advisory Committee</td>
<td>John Hoe</td>
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<td>Lilian Leong</td>
<td>Hong Kong</td>
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<td>President</td>
<td>Yung-Liang William Wan</td>
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<td>Vice-Presidents</td>
<td>Bin Lu</td>
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<td>Ming Ting Wu</td>
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<tr>
<td>Immediate Past-President</td>
<td>Hajime Sakuma</td>
<td>Japan</td>
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<td>President-elect</td>
<td>Bin Lu</td>
<td>China</td>
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<td>Auditor</td>
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### Office of the President (PO)

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<td>Scientific Affairs</td>
<td>Wen Yih Tseng</td>
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### Administration Office (AO)

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<td>Treasurer</td>
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<td>Dong Hyun Yang</td>
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<td>Jongmin Lee</td>
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## Executive Committee

### Ordinary Committee

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<tr>
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## Organizing Committee of ASCI 2021

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<thead>
<tr>
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<tbody>
<tr>
<td><strong>Executive Members</strong></td>
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<tr>
<td>Congress President</td>
<td>Hoang Minh Loi, M.D. Ph.D.</td>
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<tr>
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<td>Vu Dang Luu, M.D. Ph.D.</td>
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Local Organizing Committee

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Scientific Program Committee

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<td>Deputy Chair</td>
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<td>Pham Manh Hung, M.D. Ph.D</td>
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## Congress information

- **Congress Title:** The 14th Congress of the Asian Society of Cardiovascular Imaging (ASCI 2021)
- **Date:** 19th August (THU) - 21st August (SAT)
- **Venue:** Vietnam
- **Official Language:** English
- **Hosted by:**
  - The Asian Society of Cardiovascular Imaging
    [http://www.asci-heart.org](http://www.asci-heart.org)
  - Vietnamese Society of Radiology and Nuclear Medicine
## Virtual Events

### Opening Ceremony

Date and Time: 10:00 - 10:30, Thursday, 19th August

<table>
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<tr>
<th>Awards</th>
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<tr>
<td>ASCI Outstanding Award</td>
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<tr>
<td>ASCI Gold Medal</td>
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### Best Young Presenter Award Session  

**Channel 3**

Date and Time: 10:30 - 12:00, Friday, 20th August

### General Assembly  

**Channel 2**

Date and time: 13:30 - 14:00, Saturday, 21st August

### Closing Ceremony  

**Channel 1**

Date and Time: 16:00 - 17:00, Saturday, 21st August

<table>
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<tr>
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<tr>
<td>“ASCI Best Young Presenter Award”</td>
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ASCI Outstanding Award

Professor Mochizuki has been a member of the ASCI Executive Committee since the foundation of ASCI and he has served many posts within ASCI Executive Committee as Vice-President, Auditor, International Liaison officer and Ordinary Committee member of Japan. This Outstanding Award is to honor his contribution and dedication to the Society.

Short Biography

**Dr. Teruhito Mochizuki** graduated Ehime University School of Medicine in 1980, and completed his Radiology training at Ehime University Hospital.

In 1983, he started ECG-gated myocardial SPECT world firstly, using rotating gamma camera and published the work in J Nuc Med (1991; 32:1496-1500). In 1996, he applied his NM idea to single helical CT (0.8 sec/rotation), to generate 2D/3D movie (4D CT) of the heart (AJR 2000;174:203-208). He proposed various applications of CT for cardiac imaging and assessment such as coronary imaging (stenosis), myocardial perfusion (ischemia) and quantification of myocardial blood flow (ml/g/min), cardiac function (EDV/ESV, LVEF, cardiac output), and so on. He published his work in major journals.

**By his achievements**, he became a professor and chairman of the Department of Radiology, Ehime University School of Medicine, Ehime Japan in 2004.


**He has been working** as a diagnostic radiologist and nuclear medicine physician for 45 years. He established his Department of Radiology as one of the world leaders of the cardiac imaging using CT, MR, and SPECT/PET, publishing many papers in major journals.
ASCI Gold Medal

The ASCI Gold Medal is awarded to an ASCI member to recognize his or her outstanding academic achievements. The Nominating Committee considers the nominee’s publications and participation in ASCI activities when selecting the Gold Medal Winner. We are proud to announce that the seventh ASCI Gold Medal goes to Professor Dong Hyun Yang of Asan Medical Center, University of Ulsan College of Medicine, Seoul, Korea.

- Dong Hyun Yang is the Associate Professor of the Department of Radiology, Asan Medical Center, University of Ulsan College of Medicine.

- He is an active member of professional societies including the Korean Society of Radiology, Korean Society of Cardiovascular Imaging, and Asian Society of Cardiovascular Imaging. During his career, he has published two book chapters and 126 SCI(E) articles related to cardiovascular imaging. He is one of the editorial board members of the Korean Journal of Radiology and international advisory board members of the Heart. The application and development of new technology such as 3D printing, artificial intelligence, and 4D flow MRI in cardiovascular medicine is the main interest of Prof. Yang. He is leading the Medical Imaging and Intelligent Reality Lab (https://www.mi2rl.co) in Asan Medical Center as an M.D. director.

- Prof. Yang had been studied in the college of Medicine of Pusan National University since 1994. In 2001, he was a resident of the Department of Radiology, Asan Medical Center for 4 years. He completed his master’s (M.S.) and doctoral (Ph.D.) course at Ulsan University under the supervision of Professor Tae-Hwan Lim. He completed his fellowship in cardiovascular imaging and pediatric radiology at Asan Medical Center. Then, he was appointed to the Assistant Professor of the Department of Radiology in Asan Medical Center in 2012. From 2015 to 2016, he stayed in Dalio Institute of Cardiovascular Center, Presbyterian Hospital and the Weill Cornell Medical College, New York, NY as a visiting scholar. He is currently serving as the director of the cardiac imaging center of the Heart Institute in Asan Medical Center.
## Invited Speakers and Chairperson

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<th>Name</th>
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<tbody>
<tr>
<td>Suhny Abbara</td>
<td>USA</td>
<td>Bae Young Lee</td>
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<td>Truong Quang Binh</td>
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<td>Natale Luigi</td>
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<td>James Kirkpatrick</td>
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<td>Akira Kurata</td>
<td>JPN</td>
<td>Hwan Seok Yong</td>
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Suhny Abbara   (USA)   Greg Kicska   (USA)
Jose Banchs   (USA)   James Kirkpatrick   (USA)
Shyh-Jye Chen   (TWN)   Kakuya Kitagawa   (JPN)
Carmen Chan   (HKG)   Sung Min Ko   (KOR)
Stephen Cheung   (HKG)   Akira Kurata   (JPN)
Sang-Geon Cho   (KOR)   Wyman Lai   (USA)
Yeon Hyeon Choe   (KOR)   Bae Young Lee   (KOR)
Byoung Wook Choi   (KOR)   Jongmin Lee   (KOR)
Eui-Young Choi   (KOR)   Wen-Jeng Lee   (TWN)
Hong Yoon Choi   (KOR)   Whal Lee   (KOR)
Sang Il Choi   (KOR)   Gary Liew   (AUS)
Ki Seok Choo   (KOR)   Stephen H. Little   (USA)
Eun Ju Chun   (KOR)   Hoang Minh Loi   (VNM)
Ta Manh Cuong   (VNM)   Bin Lu   (CHN)
Nguyen Quoc Dung   (VNM)   Natale Luigi   (ITA)
Nguyen Hoang Dinh   (VNM)   Tim Leiner   (NLD)
Jean-Nicolas Dacher   (FRA)   Roberto M. Lang   (USA)
Marc Dweck   (GBR)   Noriko Oyama-Manabe   (JPN)
Marco Francone   (ITA)   Teruhito Mochizuki   (JPN)
Bernhard Gerber   (BEL)   James Moon   (GBR)
Hyun Woo Goo   (KOR)   Koen Nieman   (USA)
Nguyen Thi Thu Hoai   (VNM)   Nguyen Ho Thi Nga   (VNM)
Le Ngoc Ha   (VNM)   Karen Or dov as   (USA)
John Hoe   (SGP)   Hideki Ota   (JPN)
Yoo Jin Hong   (KOR)   Hyung-bok Park   (KOR)
Jin Hur   (KOR)   Pravin Patil   (USA)
Nguyen Thi Huyen   (VNM)   Steffen Peter   (GBR)
Sung Ho Hwang   (KOR)   Vera H. Rigolin   (USA)
Masaki Ishida   (JPN)   Hajime Sakuma   (JPN)
Lotz Joachim   (DEU)   U Joseph Schoepf   (USA)
Jung Im Jung   (KOR)   Nicole Sieberlich   (USA)
Joon Won Kang   (KOR)   Duong Phi Son   (VNM)
Mai Trong Khoa   (VNM)   Nguyen Tung Son   (VNM)
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<tr>
<td>Lynette Teo</td>
<td>SGP</td>
<td>Lei Xu</td>
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<td>Prof. Micheal Salerno</td>
<td>USA</td>
<td>Weitao Ye</td>
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<td>Hoang Anh Tien</td>
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Exhibition information
## Program at a Glance

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<thead>
<tr>
<th>Time (GMT+7)</th>
<th>Channel 1</th>
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<tbody>
<tr>
<td>8:30 - 10:00</td>
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<td>ASE and VSE course</td>
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<td>10:00 - 10:30</td>
<td>Opening Ceremony</td>
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<td>Gold medal and Outstanding Awards</td>
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<td>Group Photo</td>
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<td>10:30 - 12:00</td>
<td>Plenary Session</td>
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<td>Beyond the Future of Cardiovascular Imaging:</td>
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<td>Opportunities and Challenges</td>
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<td>12:00 – 13:30</td>
<td>Luncheon</td>
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<tr>
<td>14:00 – 15:30</td>
<td><strong>ASCI meets SCMR</strong></td>
<td>Update lecture 1 Hot topics in Cardiac CT</td>
<td><strong>Scientific Session 1</strong></td>
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<td>New frontiers in CMR</td>
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<td>15:30 - 16:00</td>
<td>Break</td>
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<tr>
<td>16:00 - 17:30</td>
<td><strong>ASCI meets ESCR</strong></td>
<td>Educational Course 1 How to do CMR</td>
<td><strong>Scientific Session 2</strong></td>
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<td></td>
<td>Prevention of cardiovascular disease</td>
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<td>8:30 - 10:00</td>
<td><strong>ASCI meets SCCT</strong>&lt;br&gt;CT Functional assessment of CAD</td>
<td><strong>Educational Course 2</strong>&lt;br&gt;How to do Cardiac CT</td>
<td><strong>Refresh course 1</strong>&lt;br&gt;Imaging Assisted Cardiac Intervention except for TAVR</td>
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<td>10:30 - 12:00</td>
<td><strong>Special focus 1</strong>&lt;br&gt;Artificial Intelligence</td>
<td><strong>Update lecture 2</strong>&lt;br&gt;Hot topics in CMR</td>
<td><strong>Best Young Presenter Award</strong></td>
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<td><strong>ASCI meets EACVI</strong>&lt;br&gt;Multimodality in the evaluation and treatment of valvular heart diseases</td>
<td><strong>Educational Course 3</strong>&lt;br&gt;Coronary artery</td>
<td><strong>Refresh course 2</strong>&lt;br&gt;TAVR</td>
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<td>15:30 - 16:00</td>
<td><strong>Break</strong></td>
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<td>16:00 - 17:30</td>
<td><strong>Special focus 2</strong>&lt;br&gt;Team Approach: Cardio-oncology</td>
<td><strong>Educational course 4</strong>&lt;br&gt;Cardiomyopathy Essentials</td>
<td><strong>Scientific Session 3</strong></td>
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<td>8:30 - 10:00</td>
<td>Read with the experts</td>
<td>Educational Course 5</td>
<td>Scientific Session 4</td>
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<td>Valvular heart disease</td>
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<td>10:30 - 12:00</td>
<td>ASCI meets NASCI</td>
<td>Update lecture 3</td>
<td>Refresh course 3</td>
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<td>Safety in Cardiovascular Imaging</td>
<td>Aortic Disease: Team Approach</td>
<td>Acute chest pain in the ER</td>
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<td>12:00 - 13:30</td>
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<td>13:30 - 14:00</td>
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<td>General Assembly</td>
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<td>14:00 - 15:30</td>
<td>Special focus 3</td>
<td>Educational Course 6</td>
<td>Refresh course 4</td>
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<td>Patients with Stable Chest Pain: Debate Session</td>
<td>Echocardiography (joint with ASE)</td>
<td>Congenital heart disease</td>
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<td>16:00 - 17:00</td>
<td>Closing Ceremony</td>
<td>BYP Awards</td>
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<td>BYP Awards</td>
<td>ASCI 2022 Invitation</td>
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<td>Closing Remarks</td>
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</table>
PROGRAM
Day 1 - August 19 (Thursday)

ASE and VSE course

Chairpersons:  Prof. James Kirkpatrick (USA)
               Dr. Nguyen T. Thu Hoai (VNM)

8:40  Assessing Mitral Regurgitation by 2D and 3D echocardiography: Tips and Tricks
      Dr. Keith Collins (USA)

8:50  Aortic stenosis
      Dr. Ashlee Davis (USA)

9:00  Imaging the Right Ventricle
      Dr. Eric Kruse (USA)

9:10  Pulmonary hypertension
      Dr. Becky Schwaegler (USA)

9:20  Pericardial Disease
      Dr. Ashlee Davis (USA)

9:30  Congenital Heart Disease: Basic Scanning Tips and Tricks
      Dr. Dylan Johnson (USA) - Dr. Becky Schwaegler (USA)

9:40  Hands-on training: Congenital Heart Disease: Scanning Tips and Tricks
      Dr. Carol Kraft (USA)

Day 1 - August 19 (Thursday)

Plenary Session

Beyond the Future of Cardiovascular Imaging: Opportunities and Challenges

Chairpersons:  Prof. Pham Minh Thong (VNM)
               Prof. Tae-Hwan Lim (KOR)

10:30  The Future and Challenges of Cardiovascular Imaging
      Prof. Lotz Joachim (DEU)

11:15  Artificial Intelligence in Cardiovascular Imaging
      Prof. Tim Leiner (NLD)
Day 1 - August 19 (Thursday)  
Channel 1 / 14:00 – 15:30 (GMT+7)

**ASCI meets SCMR**

**New frontiers in CMR**
Chairpersons: Prof. Hajime Sakuma (JPN)  
Prof. James Moon (GBR)

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14:00  **CMR Mapping and clinical applications**  
Dr. Masaki Ishida (JPN)

14:20  **4D-Flow in the heart and great vessels**  
Prof. Dong Hyun Yang (KOR)

14:40  **Quantitative CMR Perfusion Mapping**  
Prof. James Moon (GBR)

15:00  **CMR fingerprinting and clinical applications**  
Prof. Nicole Seiberlich (USA)

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Day 1 - August 19 (Thursday)  
Channel 2 / 14:00 – 15:30 (GMT+7)

**Update lecture 1**

**Hot topics in Cardiac CT**
Chairpersons: Prof. Pham Minh Thong (VNM)  
Dr. John Hoe (SGP)

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14:00  **Integration of Cardiac CT in guidelines**  
Prof. Sang Il Choi (KOR)

14:20  **Functional CT Imaging of Myocardial Ischemia**  
Prof. U Joseph Schoepf (USA)

14:40  **Imaging coronary atherosclerotic plaque**  
Prof. Marc Dweck (GBR)

15:00  **CTA interpretation: CAD RADS® and beyond**  
Dr. John Hoe (SGP)
Scientific Session 1

Chairpersons: Dr. Nguyen Ngoc Trang (VNM)
              Prof. Sung Ho Hwang (KOR)

14:00  Assessment of left ventricular volumes, ejection fraction and regional wall motion in patients undergoing 256-Slice Dual-Source Coronary CT Angiography: a comparison with 2D-echocardiography
      Le Thi Thuy Lien (VNM)

14:10  Second-generation dual-source CT in the diagnosis of congenital heart diseases at Vietnam National Children’s Hospital
      Nguyen Thi Thanh Huong (VNM)

14:20  Correlation between diastolic left ventricular mechanical dyssynchrony parameters by gated single-photon emission computed tomography myocardial perfusion imaging and left ventricular echocardiographic indexes in early post-myocardial infarction patients
      Mai Hong Son (VNM)

14:30  Novel Intraventricular thrombus of COVID-19 Healthy Heart Patient
      Fitri Kusumastuti (IND)

14:40  Feature tracking computed tomography-derived left ventricular strain: impact according to slice thickness of the reconstructed image
      Sang Il Choi (KOR)

14:50  Severe pulmonary arterial hypertension with haemoptysis in adults caused by patent ductus arteriosus. The diagnostic approach and treatment strategy
      Nguyen Hoang Dung (VNM)

15:00  Diagnosis of coronary artery fistulas by multi detector computed tomography
      Phung Bao Ngoc (VNM)
Day 1 - August 19 (Thursday)  

**Prevention of cardiovascular disease**

Chairpersons: Prof. Yung-Liang Wan (TWN)  
             Prof. Natale Luigi (ITA)

16:00  **Significance and assessment of coronary artery calcification on non-gated non-enhanced chest CT image**
       Prof. Yung-Liang Wan (TWN)

16:20  **CT screening of CAD in high-risk patients**
       Prof. Jongmin Lee (KOR)

16:40  **CMR screening of CAD in high-risk patients**
       Prof. Natale Luigi (ITA)

17:00  **CMR screening of genetic hypertrophic cardiomyopathy (HCMP)**
       Prof. Marco Francone (ITA)

Day 1 - August 19 (Thursday)  

**Educational Course 1**

**How to do CMR**

Chairpersons: Prof. Hoang Minh Loi (VNM)  
               Prof. Yeon Hyeon Choe (KOR)

16:00  **CMR sequences: from physics to clinical applications**
       Dr. Nguyen Ngoc Trang (VNM)

16:20  **Functional Analysis: LV and RV**
       Prof. Hyun Woo Goo (KOR)

16:40  **The role of CMR in heart failure**
       Dr. Shihua Zhao (CHN)

17:00  **Late gadolinium enhancement and cardiomyopathy**
       Prof. Hoang Minh Loi (VNM)
Scientific Session 2

Chairpersons:  Dr. Nguyen Khoi Viet (VNM)  
               Dr. Jacob Pandelaki (IDN)

16:00  **Native hepatic T1 may be a potential marker for liver fibrosis in Fontan patients**  
       Akio Inage (JPN)

16:10  **The Role of Cardiac Magnetic Resonance Imaging in Congenital Heart Disease: Single Center Experience**  
       Oktavia Lilyasari (IND)

16:20  **Early left ventricular diastolic dysfunction and abnormal left ventricular-left atrial coupling in asymptomatic patients with hypertension: a cardiovascular magnetic resonance feature tracking study**  
       Yanyan Song (CHN)

16:30  **Left Ventricular Strain Can Predict Outcomes of Pulmonary Valve Replacement in Patients with Repaired Tetralogy of Fallot**  
       Baiyan Zhuang (CHN)

16:40  **Evaluation of myocardium injury on cardiac magnetic resonance imaging in patients with re-perfused after acute myocardial infarction**  
       Phung Bao Ngoc (VNM)

16:50  **Cardiovascular Magnetic Resonance Characteristics, Gene Variants and Clinical Implications in Patients with Left Ventricular non-compaction Cardiomyopathy**  
       Di Zhou (CHN)

17:00  **Circumferential Transmural Strain Difference in Patients with Apical Hypertrophic Cardiomyopathy: Assessment with Feature Tracking Cardiac Magnetic Resonance**  
       Sang Il Choi (KOR)

17:10  **Usefulness of non-contrast-enhanced angiography for congenital heart disease by SSFP radial scan**  
       Akio Inage (JPN)

17:20  **The Role of Cardiovascular Magnetic Resonance Imaging in The Diagnosis of Arrhythmogenic Right Ventricular Cardiomyopathy**  
       Elen (IND)
Day 2 – August 20 (Friday)  Channel 1 / 8:30 - 10:00 (GMT+7)

**ASCI meets SCCT**

**CT Functional assessment of CAD**

Chairpersons:  
- Dr. Kakuya Kitagawa (JPN)  
- Prof. Koen Nieman (USA)

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8:30  **Spectral detector CT for cardiovascular applications**  
Prof. Suhny Abbara (USA)

8:50  **CT-FFR: Opportunities and challenges**  
Dr. Hyung-bok Park (KOR)

9:10  **CT-Perfusion: Current status**  
Dr. Teruhito Mochizuki (JPN)

9:30  **Plaque quantification: Hype or Hope?**  
Prof. Koen Nieman (USA)

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Day 2 – August 20 (Friday)  Channel 2 / 8:30 - 10:00 (GMT+7)

**Educational Course 2**

**How to do Cardiac CT**

Chairpersons:  
- Prof. Nguyen Quoc Dung (VNM)  
- Dr. Akira Kurata (JPN)

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8:30  **Cardiac CT machine: update**  
Dr. Akira Kurata (JPN)

8:50  **Avoiding artifacts: image reconstruction and post-processing**  
Dr. Ki Seok Choo (KOR)

9:10  **For the evaluation valvular disease**  
Dr. Sung Min Ko (KOR)

9:30  **Cardiac CT in Pediatric heart diseases**  
A/Prof. Shyh-Jye Chen (TWN)
Refresh course 1

**Imaging Assisted Cardiac Intervention except for TAVR**

Chairpersons: Dr. Nguyen Ngoc Trang (VNM)
               Prof. Jin Hur (KOR)

8:30 Preprocedural imaging of CTO lesions: from anatomy to function
     Dr. Jia Yin Zhang (CHN)

8:50 AI in interventional cardiology
     Prof. Hoang Anh Tien (VNM)

9:10 For LAA Occlusion
     Prof. Jin Hur (KOR)

9:30 For RFA
     Prof. Sung Ho Hwang (KOR)
Day 2 – August 20 (Friday) Channel 1 / 10:30 - 12:00 (GMT+7)

Special focus 1

**Artificial Intelligence**

Chairpersons: Prof. Vu Dang Luu (VNM)  
Prof. Sang Il Choi (KOR)

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10:30 **AI application in Cardiac CT**  
Prof. U Joseph Schoepf (USA)

10:50 **AI application in Cardiac MR**  
Prof. Micheal Salerno (USA)

11:10 **AI application in Echocardiography**  
Prof. Roberto M Lang (USA)

11:30 **AI application in Nuclear Cardiology and Hybrid Imaging**  
Dr. Hong Yoon Choi (KOR)

Day 2 – August 20 (Friday) Channel 2 / 10:30 - 12:00 (GMT+7)

Update lecture 2

**Hot topics in CMR**

Chairpersons: Dr. Nguyen Khoi Viet (VNM)  
Prof. Teruhito Mochizuki (JPN)

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10:30 **Parametric mapping: techniques and issues**  
Prof. Byoung Wook Choi (KOR)

10:50 **CMR in Arrhythmia and Sudden Cardiac Death**  
Prof. Lotz Joachim (DEU)

11:10 **COVID and the Hearts**  
Prof. Steffen Petersen (GBR)

11:30 **Non-contrast CMR applications**  
Prof. Tim Leiner (NLD)
<table>
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<tr>
<th>Time</th>
<th>Presentation</th>
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<tr>
<td>10:30</td>
<td>MRI derived Global Early Diastolic Longitudinal Strain Rate and Prognosis of Patients with Heart Failure with Preserved Ejection Fraction (HFP EF)</td>
<td>Jian He (CHN)</td>
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<tr>
<td>10:40</td>
<td>Rest Perfusion Myocardial Computed Tomography: a Novel Imaging Marker for Left Ventricular Ejection Fraction Recovery in Systolic Heart Failure Patients</td>
<td>Habibie Arifianto, MD, FIHA (IDN)</td>
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<tr>
<td>10:50</td>
<td>Identify Ischemic, Infarcted, Hibernate, and Normal Myocardium by Stress and Rest T1 Mapping without the Application of Gadolinium Contrast Agents</td>
<td>Baiyan Zhuang (CHN)</td>
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<tr>
<td>11:00</td>
<td>Feasibility of a deep learning-based stair-step artifact reduction in coronal reformation of contrast-enhance chest CT</td>
<td>Eun-Ju Kang (KOR)</td>
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<td>11:10</td>
<td>Texture analysis of magnetic resonance T1 maps and extracellular volume in heart failure compared with normal controls</td>
<td>Anh Thi Ngoc Chau (VNM)</td>
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Day 2 – August 20 (Friday) Channel 1 / 14:00 - 15:30 (GMT+7)

**ASCI meets EACVI**

*Multimodality in the evaluation and treatment of valvular heart diseases*

Chairpersons: Dr. Nguyen T. Thu Hoai (VNM)  
               Prof. Bernhard Gerber (BEL)

14:00  **Echocardiography**  
       Dr. Nguyen T. Thu Hoai (VNM)

14:20  **CT**  
       Prof. Marc Dweck (GBR)

14:40  **MRI**  
       Prof. Bernhard Gerber (BEL)

15:00  **Nuclear Imaging**  
       Dr. Sang-Geon Cho (KOR)

Day 2 – August 20 (Friday) Channel 2 / 14:00 - 15:30 (GMT+7)

**Educational Course 3**

*Coronary artery*

Chairpersons: Prof. Jung Im Jung (KOR)  
               Dr. Sutipong Jongjirasiri (THA)

14:00  **Optimal CTA protocol**  
       Prof. Hoang Minh Loi (VNM)

14:20  **Coronary artery anomaly**  
       Prof. Jung Im Jung (KOR)

14:40  **Atherosclerotic Vulnerable Plaque: Current Perspectives**  
       Dr. Eun Ju Chun (KOR)

15:00  **MR coronary angiography**  
       Prof. Hajime Sakuma (JPN)
Refresh course 2

TAVR

Chairpersons:  Prof. Do Doan Loi (VNM)
               Prof. Tae Hoon Kim (KOR)

14:00  **Clinical update**
       Prof. Tan Swee Yaw (SGP)

14:20  **Echocardiography approach**
       Prof. James Kirkpatrick (USA)

14:40  **Cardiac CT planning: from A to Z**
       Prof. Jean-Nicolas Dacher (FRA)

15:00  **Post TAVR: what is the issue?**
       Prof. Jean-Nicolas Dacher (FRA)
Day 2 – August 20 (Friday)  

**Special focus 2**

**Team Approach: Cardio-oncology**

Chairpersons: Prof. Mai Trong Khoa (VNM)  
Dr. Lilian Leong (HKG)

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16:00  **Cardiac tumors: diagnosis and management**  
Prof. Ta Manh Cuong (VNM)

16:20  **Role of Echocardiography**  
Dr. Carmen Chan (HKG)

16:40  **CMR: state of the art**  
Dr. Yoo Jin Hong (KOR)

17:00  **Clinical Cases Challenges**  
Dr. Eui-Young Choi (KOR)

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Day 2 – August 20 (Friday)  

**Educational course 4**

**Cardiomyopathy Essentials**

Chairpersons: Prof. Hoang Minh Loi (VNM)  
Dr. Sanjaya Viswamitra (IND)

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16:00  **HCM**  
Dr. Karen Ordovas (USA)

16:20  **Amyloidosis and Sarcoidosis**  
Dr. Noriko Oyama-Manabe (JPN)

16:40  **Myocarditis**  
Dr. Nguyen Ho Thi Nga (VNM)

17:00  **The Role of CMRI in HF**  
Dr. Lei Xu (CHN)
Day 2 – August 20 (Friday)  Channel 3 / 16:00 - 17:30 (GMT+7)

Scientific Session 3
Chairpersons:  Dr. Nguyen Truong Giang (VNM)  
Dr. Oraporn See (THA)

16:00  Enhancing Mass in Left Atrial Appendage - Common Pathology in Uncommon Location  
        Pan Pan Ng (HKG)

16:10  A rare case of isolated right ventricular non-compaction  
        Ingrid Maria Pardede (IND)

16:20  Cardiac cysticercosis on magnetic resonance imaging  
        Nguyen Thanh Van (VNM)

16:30  Asymptomatic right ventricle cavernous hemangioma: A case report  
        Vu Thi Thu Thuy (VNM)

16:40  Acute myocardial infarction in patient with single coronary artery: a case report  
        Nguyen Thi Huyen (VNM)

16:50  Double atrial septum  
        Tran Huu Nghi (VNM)
Day 3 - August 21 (Saturday)  

**Read with the experts**

Chairpersons: Prof. Do Doan Loi (VNM)  
              Prof. Jongmin Lee (KOR)

8:30  **Case 1: Penetrating atherosclerotic ulcer**  
      Prof. Whal Lee (KOR)

8:45  **Case 2: RCA**  
      Prof. Ming-Ting Wu (TWN)

9:00  **Case 3: TEER**  
      Prof. Stephen H. Little (USA)

9:15  **Case 4: An emergency of Large vessel vasculitis**  
      Dr. Hideki Ota (JPN)

9:30  **Case 5: Acute myocardial infarction in patient with single coronary artery: a case report**  
      Dr. Nguyen Thi Huyen (VNM)

9:45  **Case 6: The role of multimodality imaging in a patient with pericardial effusion**  
      Dr. Carmen Chan (HKG)

Day 3 – August 20 (Friday)  

**Educational Course 5**

**Valvular heart disease**

Chairpersons: Prof. Truong Quang Binh (VNM)  
              Dr. Stephen Cheung (HKG)

8:30  **Aortic valvular disease: frequently noted**  
      Dr. Joon Won Kang (KOR)

8:50  **Mitral valvular disease: emerging interest**  
      Dr. Greg Kicska (USA)

9:10  **Post-operative or post-procedural valve: what should we know**  
      Prof. Bernhard Gerber (BEL)

9:30  **Multimodality approach of infective endocarditis**  
      Dr. Weitao Ye (CHN)
Day 3 - August 21 (Saturday)  Channel 3 / 8:30 - 10:00 (GMT+7)

**Scientific Session 4**

Chairpersons: Prof. Nguyen P.Bao Quan (VNM)
               Prof. Hwan Seok Yong (KOR)

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8:30  **Subclinical changes in cardiac function detected by speckle tracking echocardiography in the patient with systemic hypertension**  
      Nguyen Thi Diem (VNM)

8:40  **Endocardial 2D speckle-tracking echocardiography in patients with ischemic heart disease**  
      Nguyen Le Hoang Minh (VNM)

8:50  **Successful device closure of a large rupture of sinus of Valsalva in patient with bicuspid aortic valve**  
      Nguyen Thi Minh Ly (VNM)

9:00  **Dilated IVC without cardiac pathology, the first case in Indonesia**  
      Kana Kurniati Elka (IDN)

9:10  **Aneurysm of sinus of Valsalva dissecting into interventricular septum: 3D echocardiographic images**  
      Pham Thu Thuy (VNM)

9:20  **Formation of mitral-aortic intervalvular fibrosa pseudo-aneurysm (MAIVF-Ps) detected by consecutive echocardiograms - no longer an incidental finding**  
      Pham Thu Thuy (VNM)

9:30  **Decreased Global Longitudinal Strain in Rheumatic Mitral Stenosis with Preserved Left Ventricular Ejection Fraction: A Cardiac Magnetic Resonance Feature Tracking Study**  
      Elen (IDN)

9:40  **Value of myocardial strain in prognosis of major adverse events in non ST segment elevation acute coronary syndrome after percutaneous coronary intervention**  
      Trinh Viet Ha (VNM)
Day 3 - August 21 (Saturday)  
Channel 1 / 10:30 - 12:00 (GMT+7)

**ASCI meets NASCI**

**Safety in Cardiovascular Imaging**

Chairpersons:  
Prof. Bui Van Giang (VNM)  
Dr. Greg Kicska (USA)

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10:30  **Patients with Pacemakers/ICDs: is this safe for CMR**  
Dr. Karen Ordovas (USA)

10:50  **CT contrast safety**  
Prof. Whal Lee (KOR)

11:10  **CT radiation safety: common questions**  
Dr. Greg Kicska (USA)

11:30  **Medications in cardiac imaging**  
Dr. Stephen Cheung (HKG)

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Day 3 - August 21 (Saturday)  
Channel 2 / 10:30 - 12:00 (GMT+7)

**Update lecture 3**

**Aortic Disease: Team Approach**

Chairpersons:  
Prof. Huynh Van Minh (VNM)  
Prof. Ming-Ting Wu (TWN)

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10:30  **CT of the aorta: Interpretation and pitfalls**  
Prof. Ming-Ting Wu (TWN)

10:50  **New trends in surgical decision making and techniques**  
Prof. Nguyen Hoang Dinh (VNM)

11:10  **Perspective: aortic intervention**  
Dr. Nguyen Tung Son (VNM)

11:30  **4D flow imaging of aorta: is it promising?**  
Prof. Dong Hyun Yang (KOR)
Day 3 - August 21 (Saturday)  

Refresh course 3

Acute chest pain in the ER
Chairpersons:  Prof. Bin Lu (CHN)
Dr. Ki Seok Choo (KOR)

10:30  Clinical scenario with imaging application  
Dr. Gary Liew (AUS)

10:50  Cardiac CT: the evidence  
Dr. Bin Lu (CHN)

11:10  CMR in acute chest pain  
Dr. Lynette Teo (SGP)

11:30  Triple rule-out: is it still useful  
Dr. Wen-Jeng Lee (TWN)

Day 3 - August 21 (Saturday)  

General Assembly
Special focus 3

Patients with Stable Chest Pain: Debate Session
Chairpersons: Prof. Le Ngoc Ha (VNM)  
             Prof. Hwan Seok Yong (KOR)

14:00 More evidence: SPECT is the best  
       Prof. Le Ngoc Ha (VNM)

14:20 CT-FFR is better  
       Prof. Koen Nieman (USA)

14:40 CT-Perfusion is better  
       Dr. Kakuya Kitagawa (JPN)

15:00 Stress CMR is better  
       Prof. James Moon (GBR)

Echocardiography (joint with ASE)
Chairpersons: Prof. Pham Nguyen Vinh (VNM)  
              Prof. James Kirkpatrick (USA)

14:00 The future of valve imaging  
       Prof. Vera H. Rigolin (USA)

14:15 Innovation of echocardiography for risk assessment  
       Prof. Jose Banchs (USA)

14:30 Innovation of echocardiography for congenital heart disease  
       Dr. Wyman Lai (USA)

14:45 Innovation of echocardiography and cardiac imaging in preventive cardiology  
       Prof. Pravin Patil (USA)

15:00 Update in Echocardiography in Competitive athletes- Roles of Multimodality Cardiac Imaging  
       Dr. Nguyen T.Thu Hoai (VNM)
Day 3 - August 21 (Saturday)  

Refresh course 4

**Congenital heart disease**

Chairpersons:  Dr. Nguyen Ngoc Trang (VNM)  
Prof. Hyun Woo Goo (KOR)

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14:00  **CT evaluation of CHD**  
Dr. Duong Phi Son (VNM)

14:20  **MR evaluation of CHD**  
Dr. Hideki Ota (JPN)

14:40  **Role of 3D printing**  
Prof. Whal Lee (KOR)

15:00  **Postoperative of CHD**  
Prof. Hyun Woo Goo (KOR)
DAY 1 - AUGUST 19 (THURSDAY) / CHANNEL 2

8:30 - 10:00 (GMT + 7)
ASE and VSE course

Chairperson(s)

Prof. James Kirkpatrick (USA)  Dr. Nguyen Thi Thu Hoai (VNM)

Speaker/Lecturers

8:30  Introduction  Prof. James N Kirkpatrick (USA)
8:40  Assessing Mitral Regurgitation by 2D and 3D echocardiography: Tips and Tricks  Dr. Keith Collins (USA)
8:50  Aortic stenosis  Dr. Ashlee Davis (USA)
9:00  Imaging the Right Ventricle  Dr. Eric Kruse (USA)
9:10  Pulmonary hypertension  Dr. Becky Schwaegler (USA)
9:20  Pericardial Disease  Dr. Ashlee Davis (USA)
9:30  Congenital Heart Disease: Basic Scanning Tips and Tricks  Dr. Dylan Johnson (USA) - Dr. Becky Schwaegler (USA)
9:40  Hands-on training: Congenital Heart Disease: Scanning Tips and Tricks  Dr. Carol Kraft (USA)
DAY 1 - AUGUST 19 (THURSDAY) / CHANNEL 1

10:30 - 12:00 (GMT + 7)

Plenary Session

Beyond the Future of Cardiovascular Imaging: Opportunities and Challenges

Chairperson(s)

Prof. Pham Minh Thong (VNM)
Prof. Tae-Hwan Lim (KOR)

Speaker/Lecturers

Prof. Lotz Joachim (DEU)
Prof. Tim Leiner (NLD)

10:30  The Future and Challenges of Cardiovascular Imaging

Prof. Lotz Joachim (DEU)

11:15  Artificial Intelligence in Cardiovascular Imaging

Prof. Tim Leiner (NLD)
Speaker

Prof. Lotz Joachim
(NLD)

Professor of Radiology, Director, Department of Diagnostic and Interventional Radiology, University Medical Center Göttingen

Email:

Professional career

Since 2010
Professor of Radiology, Director, Department of Diagnostic and Interventional Radiology, University Medical Center Göttingen

2008, Dez
Visiting Professor of Radiology, Duke University Hospital, Dep. of Radiology,

2005 - 2010
Lecturer, Assistant/Associate Professor, MHH, Hannover, Germany

2007 - 2010
Second Vice Chair of the Department of Radiology, MHH, Hannover, Germany

2002 - 2010
Staff Radiologist, Dep. of Radiology, MHH, Hannover, Germany

1995 - 2002
Residency in Radiology and Neuroradiology, MHH, Hannover, Germany

1994 - 1995
Internship in Dep. Abdominal and Transplant Surgery, MHH, Hannover, Germany

Fellowships, awards, and honours

Since 2016
Ambassador of the German Roentgen Society for China
Since 2016
Mentor of the Studienstiftung des Deutschen Volkes
2013
Felix Wachsmann-Preis German Roentgen Society

1999
Certificate of Merrit RSNA

1998
The John M. Kinney Award 1998, Nestle

1991-1995
Studienstiftung des Deutschen Volkes

Professional activities

2016- 2018
Speaker of the AG Herz und GefäBe, Deutsche Roentgengesellschaft

Since 2012
Speaker for Imaging in German Center of Cardiovascular Research (DZHK)

Since 2014
Mentor for Studienstiftung des Deutschen Volkes
Research interests

Quantitative and functional Imaging. Cardiovascular and abdominal Imaging.
Publications >120 Original Publications
>420 Scientific / educational talks

Abstract

The Future and Challenges of Cardiovascular Imaging
Speaker

Prof. Tim Leiner

(NLD)

School for Cardiovascular Diseases - CARIM (UM)

Email  T. Leiner-at- umcutrecht.nl

Current research

Project leader

Comprehensive, High definition Accelerated Non-invasive Cardiac MRI for Early diagnosis of patients with symptomatic heart disease. (CHANCE)

Completed research projects

Project leader

Towards understanding the interplay of inflammation, immunity and circulating cells in atherosclerosis development in young adulthood: a magnetic resonance study

Project leader

Detection of vulnerable plaque with coronary vessel wall magnetic resonance imaging

Classification

D23222  Cardiovascular disorders
D23330  Radiology, radiotherapy

Abstract

Artificial Intelligence in Cardiovascular imaging
DAY 1 - AUGUST 19 (THURSDAY) / CHANNEL 1

14:00 – 15:30 (GMT + 7)
ASCi meets SCMR
New frontiers in CMR

Chairperson(s)

Prof. Hajime Sakuma (JPN)  
Prof. James Moon (GBR)

Speaker/Lecturers

Dr. Masaki Ishida (JPN)  
A/Prof. Dong Hyun Yang (KOR)  
Prof. James Moon (GBR)  
Prof. Nicole Sieberlich (USA)

14:00  
CMR Mapping and clinical applications
Dr. Masaki Ishida (JPN)

14:20  
4D-Flow in the heart and great vessels
A/Prof. Dong Hyun Yang (KOR)

14:40  
Quantitative CMR Perfusion Mapping
Prof. James Moon (GBR)

15:00  
CMR fingerprinting and clinical applications
Prof. Nicole Sieberlich (USA)
**Speaker**

**Dr. Masaki Ishida**

(JPN)

Department of Radiology, Graduate School of Medicine, Mie University, Mie, Japan
School of Medicine, Mie University, Mie, Japan

Email mishida@med.mie-u.ac.jp
ishidamasaki1@gmail.com

**Professional experience**

2020-present  Associate Professor, Department of Radiology, Mie University Graduate School/ Faculty of Medicine, Tsu, Mie, Japan

2019-2020  Lecturer, Department of Radiology, Mie University Hospital, Tsu, Mie, Japan

2013-2019  Assistant Professor, Department of Radiology, Mie University Hospital, Tsu, Mie, Japan

2012-2013  Clinical Assistant Professor, Department of Radiology, Mie University Hospital, Tsu, Mie, Japan

2011-2012  Chief Radiologist, Department of Radiology, Suzuka Central Hospital, Suzuka, Mie, Japan.

2009-2011  Clinical Research Fellow, Division of Imaging Sciences, St Thomas’ Hospital, Kings College London, London, UK

2006-2009  Staff Radiologist, Department of Radiology, Mie University Hospital, Tsu, Mie, Japan

2001-2004  Fellow, Department of Radiology, Mie University Hospital, Tsu, Mie, Japan.

1999-2001  Resident in Radiology, Department of Radiology, Matsusaka Central Hospital, Matsusaka, Mie, Japan.

**Board certification**

2004  Board Certified Member of the Japanese College of Radiology, #4427 (R10769DR)

**Medical licensure**

1999  Full Medical License (Japan), #400468
Membership

Society for Cardiovascular Magnetic Resonance
Radiological Society of North America
European Society of Radiology
European Society of Cardiology
Japanese Society of Radiology
Japanese Society of Nuclear Medicine
Japanese Society of Magnetic Resonance in Medicine
Japanese Society of Interventional Radiology
Japanese Circulation Society

Certificate of exam
1. Passed the Cardiovascular Magnetic Resonance examination organized by the Working Group on Cardiovascular Magnetic Resonance of the European Society of Cardiology in Nice, France on 06/02/2011

Bibliography: publications in english
Abstract

CMR Mapping and clinical applications

CMR multiparametric mapping including T1, T2 and ECV mapping has emerged as a novel technique for myocardial tissue characterization. In the last decade, growing evidence has accumulated demonstrating how this technique is useful in the clinical decision making especially in the management of myocardial diseases including cardiomyopathy, myocardial storage diseases and myocarditis. In this talk, I will explain the clinical utility of the CMR mapping technique in the management of myocardial diseases showing several cases with literature review.
Education and post-graduate training

1. Education

1994.03 - 2000.02  M.D. (License #70559)
   Pusan National University, School of Medicine, Pusan, Korea
2002.03 - 2004.02  M.S.
   University of Ulsan, College of Medicine, Seoul, Korea
2008.03 - 2013.02  Ph.D.
   University of Ulsan, College of Medicine, Seoul, Korea
2015.08 - 2016.07  Visiting Scholar, Dalio Institute of Cardiovascular Center, New York - Presbyterian Hospital and the Weill Cornell Medical College, New York, NY

2. Post-graduate training

2000.03 - 2005.02  Internship & Residencyship in Radiology Asan Medical Center, Seoul, Korea
2005.03 - 2008.04  Military Service as a doctor
   Aerospace Medical Center, Chungju, Chungbuk, Korea
2008.05 - 2009.02  Fellowship of pediatric radiology
   Asan Medical Center, Seoul, Korea
2009.03 - 2011.02  Radiologist in private clinic
   Dongyang Radiology Clinic, Daejeon, Korea
2011.03 - 2012.03  Fellowship of cardiovascular radiology
   Asan Medical Center, Seoul, Korea
2012.03 - 2017.02  Assistant professor of Radiology
   Asan Medical Center, Seoul, Korea

Speaker

A/Prof. Dong Hyun Yang (KOR)
Associate professor of Radiology,
Director of Cardiovascular Imaging Center, Heart Institute,
Asan Medical Center, University of Ulsan College of Medicine, Seoul, Korea
Director (M.D.) of Medical Imaging and Intelligent Reality Lab

Email  donghyun.yang@gmail.com
2017.02 - current  Associate professor of Radiology,
Director of Cardiovascular Imaging Center, Heart Institute, Asan Medical Center,
University of Ulsan College of Medicine, Seoul, Korea

Publications


Abstract

4D-Flow in the heart and great vessels
**Speaker**

**Prof. James Moon**  
(GBR)
Professor of Cardiology, UCL/UCLH/Barts  
Clinical Lead CMR, Barts Heart Centre  
Email James@moonmail.co.uk

**Education / Qualifications**

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<th>Year</th>
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<tbody>
<tr>
<td>2020</td>
<td>Web of Science Highly Cited Researcher</td>
</tr>
<tr>
<td>2018</td>
<td>FRCP</td>
</tr>
<tr>
<td>2005</td>
<td>MD (London), MRCP</td>
</tr>
<tr>
<td>1995</td>
<td>MB BCh, Christ Church, Oxford University</td>
</tr>
<tr>
<td>1992</td>
<td>BA, St Catharine’s, Cambridge University</td>
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</tbody>
</table>

**Other Posts:**  
Former clinical director, imaging Barts Heart Centre  
Past president, British Society of CMR.  
Medical Director, Chenies Mews Imaging Centre  
Founder/prior Chair: International T1 mapping working group  
Editorial Board: Circulation, Nature Scientific Reports, JCMR  
Program Chair EuroCMR 2017; BSCMR 2012.  
BHF fellowship committee 2021

**Publications:**

Web of Science Highly Cited Researcher. 392 Pubmed papers; H-index 76, citations 32,800. Fellows have won around 20 Young Investigator Awards (eg BCS, ESC, BSCMR, SCMR)

**Research goals:** To understand the heart and use this to improve outcomes via better diagnoses and therapies. My group develops new tests and measurement techniques linking technical development to human variation (health, rare and common diseases) from idea to global delivery. Examples include LGE, T1, T2, ECV mapping, perfusion mapping, AI analytics, new metrology/QC frameworks, rapid CMR and CMR for pacemakers. We change how people think about the heart and accelerate delivery across boundaries (clinical disciplines, basic science, global healthcare).
**Covid Research:** Former Nightingale Hospital head of research. Chief Investigator: COVIDsortium, the HealthCare Workers Study. Started on lockdown day, the first HRA approved UK study. (~10 universities, NCT04318314). Grants from UKRI, Rosetrees, BMA. £1.4m raised (philanthropy – Goldman Sachs, Citadel Hedgefund, Justgiving). First 15 papers high impact eg Science, Lancet x3, PLOS1, Sci Immun, Circulation, EHJ, JACC imaging. 430 news articles to date. Informed national policies (UK, France, Spain, USA eg here)

**Senior academic Team:**

Professor Peter Kellman: Visiting professor UCL and Barts from NIH  
Dr Charlotte Manisty: Senior Lecturer in Heart failure and CMR  
Dr Thomas Treibel, Senior lecturer (BHF Intermediate)  
Dr Rhodri Davies, machine learning and cardiology (BHF Accelerator)  
Professor Marianna Fontana, Director Royal Free Hospital CMR (BHF Intermediate)  
Dr Gaby Captur: Senior lecturer, UCL (LHA grant)  
7. Dr Luis Lopes, cardiology and cardiomyopathy (Wellcome CARP)

**Infrastructure:** (BHC and CMIC are part of the UCL CMR network, with RFH and GOS).  
**1. Barts Heart Centre:** the largest cardiac centre in Europe including the largest global CMR centre, Europe’s largest cardiac CT services; UKs largest echo service  
**2. Chenies Mews Imaging Centre:** part of the UCL phenotyping centre, including 13 research clinic rooms, DEXA, 3x CPEX, and space for 20 researchers (Profs A Hughes, N Chaturvedi).  
**Hardware:** CMR: 3x Aera, 2x Prisma, all upgraded with 32 core linux boxes and cloud reconstruction. CT: 1x Force. Echo: 19 machines, 5 sites. Nuclear: 4 sites inc PET-CT.  
**Activity (pa):** 11,000 CMRs, 4500 cardiac CTs, 60,000 echos, 2500 nuclear cardiac scans  
**Software:** 3 CVI servers, ~30 workstations; Syngo.via x 2 networks, Hermes, Tomtec, GE image vault, REDCap running >250 studies. 5.7Tb image Corelab. SFTP file exchange server

**Supervision: Currently 6 fellows:**  
1. **Dr George Joy:** microarchitecture of Hypertrophic Cardiomyopathy.  
2. **Dr Jessica Artico:** Covid (maternity leave)  
3. **Dr Hibba Gadir:** Fabry cardiomyopathy
4. Dr Katia Menacho: “The $100 dollar 15 minute CMR scan”
6. Dr Rebecca Hughes the clinical spectrum of apical HCM
7. Dr Kush Patel, the role of the myocardium in TAVI patients

Former Fellows: Flett, Hasleton, Sado, Bandula, Banyprasad, White, Fontana, Captur, Treibel, D’Silva, Cheang, Merghani, Kozor, Maestrini, Torasco, Scully, Abdel-Gadir, Knott, Scully

Current Grants Around 14 active grants
2020   MRC UKRI HCW 4 centre HCW merged £725K. Co-applicant (50K)
2020   Barts Charity: COVID-HCW Study: £1.46m. Chief investigator
2020   NIHR rolling call: COVID-Heart £800K. Co-applicant (~60K)
2020   UKRI Rapid Response: Curating UK COVID-19 diagnostics. £4.2m Co-applicant (£50K)
2020   Collaborator on grants from BMA, UK T cell consortium, Neutralising antibody consortium)
2020   SBRI phase 2 OpenCare commercialisation of AI for cardiac analysis £700K co-applicant
2019   multiple AI grants (BHF x 2; SBRI)
2019   Dr Luis Lopes, Senior Lecturer, MRC CARP, Profs Elliott/Moon
2019   Dr Tom Treibel, Senior Lecturer, BHF Intermediate, Profs Moon/Hughes
2019   Dr Rhodri Davies, Senior Lecturer, CAP-AI/BHF accelerator, Prof Moon/Hughes/Alexander
2018   Arrhythmia in Fabry Disease: Role of Implantable Loop Recorders.’ £800K co-I
2018   Dr Kush Patel, the role of the myocardium in TAVI patients (Edwards) ~60K
2018   The pathophysiology of revascularisation of the poor LV: £150K, Barts Charity
2017   Rebecca Hughes: The extended spectrum of apical HCM, £250K BHF
2016   The new cardiac phenotyping centre, UCL (2 magnets - £1.39million contribution UCLH charity)

National/international Collaborations:
COVIDsortium: The leading longitudinal mild disease COVID-19 cohort (~10 university collaboration).
AS700 – a 7 centre UK study in severe AS
Fabrys400 a 6 centre study (Birmingham, London x 3, Sydney, Brisbane)
T1MES program - a 79 centre T1 mapping phantom standardisation project
REDCap for UK cardiovascular research. Currently 250 research projects
Marathon platform: 120 subjects pre and post training for first marathon.
UCL:NIH partnership for new sequence validation by Peter Kellman
Perfusion mapping group: 13 centre collaboration
Ultrafast CMR in the developing world: projects in 8 countries. www.rapidcmr.com, links to 27 other countries.
Heartome1000: Advanced imaging and 1000 cardiac biopsies to basic science (Utrecht, Pamplona, ICH)

Artificial Intelligence: aiming to increase cardiac imaging precision

MRI for pacemakers: aiming for 50,000 UK scans pa, saving 500 lives. www.mrimypacemaker.com

**Boards:** Immediate past president, BSCMR. Ed Board: Circulation, JCMR.
Advisory: Genzyme, GSK, Shire.

**Committees:** BHF fellowships, NIHR long covid, Australia imaging, EACVI guidelines

Invited Talks ~40 talks a year (formerly).

**Example 2020/2021 Papers**


Augusto JB…Moon JC. AI for HCM wall thickness measurement: Lancet Digit Health. 2021


Augusto J..Moon JC. Healthcare Workers Bioresource: Study outline Wellcome Open 2020


Treibel TA…Moon JC. COVID-19 PCR in asymptomatic health-care workers. Lancet. 2020

Captur G..Moon JC. T1 mapping performance: the multi-national phantom program. JCMR. 2020

Scully PR..Moon JC. Dual AS and amyloid in TAVI. EHJ. 2020


Everett RJ..Moon JC..Dweck MR. ECV in AS. JACC. 2020


Menacho K..Moon JC. Myocardial Inflammation in HIV. JACC imaging. 2020
Abstract

Quantitative CMR Perfusion Mapping

For many years, the assessment of coronary artery disease has been a key part of cardiological assessment. This can be anatomical or functional. Functional assessment includes either inotropic or vasodilator stress with imaging by echo, CT or nuclear. CMR perfusion is a vasodilator test, and has a strong evidence base, but until recently, assessment has been in part subjective and non-quantitative. Over the last decade, much progress has been made to quantitative perfusion. The latest approach is perfusion mapping. This is fully quantitative, expressing myocardial blood flow in mls/g/min at stress and rest. Importantly, it is "in-line" meaning results appear on the scanner within 15s of completing the scan. Initial results showed that improved confidence in reporting CAD, and highlighted multivessel disease over single vessel disease. Validations against animal models, PET and invasive assessment will be shown.

Biologically, perfusion mapping is providing considerable insights into coronary artery disease but also microvascular disease, cardiomyopathy and what is normal. Technical aspects of image quality control and judging confidence will first be explored. Then, disease findings will be discussed in detail - highlighting prognostic significance and single vs multivessel disease, overt and established disease and important new biology. For example, in those with unobstructive coronary artery disease, stress perfusion is markedly influenced by age, diabetes and LVH meaning that reference ranges for microvascular function will need to be adapted for these comorbidities. But there also appear to be more than one form of microvascular disease. In HCM, marked perfusion defects are being found in overt disease, but in gene carriers, even before hypertrophy, perfusion defects can be marked. These have the potential to rewrite our understanding of the pathophysiology of HCM. In addition, within the analysis chain of perfusion mapping, other parameters are derived. These include aspects of tracking vessel blood flow including pulmonary transit time, and pulmonary blood volume which have significant prognostic impact and have a potential role in risk stratification, and other products of deconvoluting the signal including myocardial vascular permeability and intramyocardial blood volume. These are as yet only minimally explored. With a new technique, there is a development curve and roll-out process. Technique availability and roll-out will be explored.
Professor Nicole Sieberlich

(USA)
Department of Radiology, University of Michigan
Email: nse@med.umich.edu

Education
I received my BS in Chemistry from Yale University in 2001, and my PhD in Physics from the University of Wuerzburg in 2008 under Prof. Peter Jakob.

Post-Graduate Education
I worked as a post-doctoral researcher with Prof. Mark Griswold in the Radiology Department at Case Western Reserve University and University Hospitals Cleveland Medical Center.

Academic Appointments
I became an Assistant Professor in the Department of Biomedical Engineering at Case Western Reserve University in 2011, and was promoted to the Elmer Lincoln Lindseth Associate Professor in 2016. In 2019 I moved to the University of Michigan, forming the Michigan Institute for Imaging Technology and Translation (MIITT) as an Associate Professor in the Department of Radiology.

Professional Affiliations and Scientific Publications
I am an active member of the International Society for Magnetic Resonance in Medicine (ISMRM) and a member and Board of Trustees representative for the Society for Cardiovascular Magnetic Resonance (SCMR). I am also a member of the American Heart Association (AHA), the Radiological Society of North America (RSNA), Institute of Electrical and Electronics Engineers (IEEE), and Society of Women Engineers (SWE). I have given more than 80 invited talks and conferences, and published 60+ peer reviewed manuscripts. I am the main editor of the book “Quantitative Magnetic Resonance Imaging” published by Elsevier in 2020.
Abstract

CMR fingerprinting and clinical applications

In consideration of my participation in an audiovisual program of ASCI 2021 for the presentation described above including written or visual material submitted in connection therewith (the “Presentation”), I hereby grant and release to ASCI, its successors, and assigns, the right to record my likeness and/or voice on audio or video, to edit such audio or video at the discretion of ASCI, to incorporate the same into an educational program (the “Program”), and to use my name, likeness, voice and biographical information in connection with the Presentation, including promotion in printed or electronic media.

I authorize ASCI to upload the presentation on the ASCI website as video contents only to be accessible to ASCI members. I do not allow using it for any other purpose.

I hereby release ASCI and others who may be authorized to use my Presentation from all claims, liabilities, and expenses which I now have or may hereafter have by reason of such use or by reason of any comments concerning me made by any person participating in the Program.

I hereby represent that (i) the Presentation is accurate to the best of my knowledge; (ii) the Presentation is my own original creation and will not violate the proprietary rights of any other person or organization; and (iii) the Presentation does not disparage the products or services of any person or organization, and does not contain any materials which are slanderous or otherwise illegal.

I hereby indemnify and hold ASCI, its officers, directors, employees, and agents harmless from and against any and all claims, expenses (including reasonable attorneys’ fees), and liabilities whatsoever arising, directly or indirectly, out of my participation in the Program (including, but not limited to, any injury or damage which I may suffer as a result of my participation) or from the breach of any of the above representations.
DAY 1 - AUGUST 19 (THURSDAY) / CHANNEL 2

14:00 – 15:30 (GMT + 7)

Update lecture 1
*Hot topics in Cardiac CT*

**Chairperson(s)**
- Prof. Pham Minh Thong (VNM)
- Dr. John Hoe (SGP)

**Speaker/Lecturers**
- Prof. Sang Il Choi (KOR)
- Prof. U Joseph Schoepf (USA)
- Prof. Marc Dweck (GBR)
- Dr. John Hoe (SGP)

**14:00**  Integration of Cardiac CT in guidelines
*Prof. Sang Il Choi (KOR)*

**14:20**  Functional CT Imaging of Myocardial Ischemia
*Prof. U Joseph Schoepf (USA)*

**14:40**  Imaging coronary atherosclerotic plaque
*Prof. Marc Dweck (GBR)*

**15:00**  CTA interpretation: CAD RADS® and beyond
*Dr. John Hoe (SGP)*
**Speaker**

**Prof. Sang Il Choi**

(KOR)

Associate Professor,
Department of Radiology
Seoul National University, College of Medicine
Seoul National University Bundang Hospital

Email: sichoi@snu.ac.kr, drsic@hanmail.net

**Education:**

1989-1991 Department of Pre-Medicine, College of Natural Sciences,
**Ulsan University**

1991-1995 College of Medicine, Ulsan University (M.D.)

1999-2004 Graduate School, Ulsan University (M.S.)

2005-2007 Graduate School, Ulsan University (Ph.D.)

**Employment and Experience in Academia:**

1995-1996 Intern, Asan Medical Center

1996-2000 Resident in Radiology, Asan Medical Center

2000-2003 Army Forces Chenog-ryeong Hospital, Department of Radiology (Mandatory Military Service)

2003-2004 Clinical Fellow in Radiology, Seoul National University Bundang Hospital

2004- Assistant Professor, Department of Radiology

Seoul National University Bundang Hospital

Seoul National University School of Medicine

2008.2-2009.1 Research fellow, Division of Cardiology

Department of Internal Medicine, Johns Hopkins Medicine

2012- Associate Professor, Department of Radiology

Seoul National University Bundang Hospital

Seoul National University School of Medicine

**License and Certification**

1995 Korean Medical License

2000 Korean Board of Radiology
Awards

1. “Certificate of Merit” with “MRI of Myocardial Infarction” Exhibited at the 55th Scientific Assembly and Annual Meeting of the Korean Society of Radiology, Seoul. (First Author)


3. “Academic Award” by the Korean Society of Radiology with “Irreversibly damaged myocardium at MR imaging with a necrotic tissue-specific contrast agent in a cat model” (Radiology 2000;215:863-868). (First Author)


5. “Best Scientific Exhibition Award: Gold” with “Coronary CT Angiography: Hype or New Paradigm? - focused on new algorithm as diagnostic tool in a routine clinical practice” Exhibited at the 62th Scientific Assembly and Annual Meeting of the Korean Society of Radiology, Seoul. (First Author)
Abstract

Integration of Cardiac CT in guidelines

Cardiac CT has become an important tool for the diagnosis and treatment of various cardiac disease. Multidetector CT (MDCT) is an ever-advancing technology, having evolved from the early 4-slice acquisition systems to the modern multislice cardiac CT. This will review summarizes the many potential applications of cardiac CTA for patients with various cardiac disease.

Coronary artery disease is the most important etiology of chest pain in clinical practice, has significant prognostic implications and is eminently treatable. A plethora of non-invasive testing options are available for evaluating patients presenting with chest pain that could be related to ischemic heart disease but there is significant controversy about what is the most optimal testing strategy. There is already evidence that some strategies influence hard outcomes through advantages other than revascularization and future studies may show intrinsic advantages of one strategy over the others.

In general, CTA has the advantage of reducing cardiovascular mortality and myocardial infarction. It visualizes the stenosis and theatheromatous plaque as opposed to making an educated guess about its presence, as with physiologic testing. CTA has excellent sensitivity for identifying flow limiting disease and has very high negative predictive value, making it the strongest test to rule out flow limiting CAD, especially in patients with low to intermediate risk. It has the best evidence so far for decreasing the number of procedures in patients in whom a decision to define coronary anatomy with invasive catheterization was already taken based on other non-invasive criteria.

CTA has lower specificity and positive predictive value, which places it in the same diagnostic performance band as most tests using stress imaging. However, the newer value-added modalities of CTA (CT-FFR and CTP) may significantly minimize this disadvantage. Early data from studies using CT perfusion seem to suggest a similar gain in diagnostic accuracy. It is likely that a suite of CTA based testing (CAC, CTA, FFR-CT, CTP in some combination), often needing only a small increment in time, effort, contrast agent or radiation, is likely to elevate its positive predictive value to the best of breed range.

Therefore, CTA is a robust test that, in addition to reducing myocardial infarction and cardiovascular mortality, serves as a gatekeeper invasive testing, is cost effective and better allocates the use of high cost downstream testing as well.
Joe Schoepf is a Professor with appointments in Radiology, Cardiovascular Medicine, and Pediatrics at the Medical University of South Carolina (MUSC) in Charleston, SC. At MUSC Dr. Schoepf serves as the director of the Division of Cardiovascular Imaging and as Vice Chair for Research.

Dr. Schoepf, a native of Austria, graduated from the medical school of Ludwig Maximilians University in Munich, Germany, in 1996. After his residency in Diagnostic Radiology at Klinikum Grosshadern, Munich, Germany, he assumed a position at Brigham and Women’s Hospital, Harvard Medical School, in Boston, MA, which he held from 2001-2004. Dr. Schoepf holds a current unrestricted medical license in the State of South Carolina and is certified in Diagnostic Radiology by the American and Austrian Specialty Boards as well as in cardiac CT by the American College of Radiology and the Certification Board of Cardiovascular Computed Tomography. His main clinical and scientific interest is non-invasive cardiovascular and thoracic imaging, especially the use of advanced CT and MRI techniques for diagnosing disorders of the heart and lung.

Dr. Schoepf is the Editor-in-Chief of the Journal of Thoracic Imaging and has been serving on the editorial boards of several other scientific journals including Radiology, the Journal of the American Heart Association, European Radiology, the American Journal of Roentgenology, Academic Radiology, and the Chinese Journal of Academic Radiology. He has given >400 invited lectures internationally, has authored >500 articles in peer reviewed scientific journals, >20 book chapters, and five books.

Dr. Schoepf is Past President of the North American Society for Cardiovascular Imaging and is a member of numerous other scientific societies. He has been serving as chairman of several committees of the American College of Radiology, the Radiological Society of North America, American Heart Association, Society of Computed Body Tomography and MR, and the Society of Thoracic Radiology. He is an honorary member of the Hungarian Radiology Society and of the Société Canadienne-Française de Radiologie and received Honorary Professorship from Nanjing University, China. Dr. Schoepf was elected Fellow of the American College of Radiology, American Heart Association, North American Society...
of Cardiovascular Imaging, Society of Computed Body Tomography and MR, and of the Society for Cardiovascular CT.

Dr. Schoepf has been named among the top 10 cardiovascular imagers worldwide by Medical Imaging Magazine two years in a row. He has been continuously listed among the Best Doctors in America® since 2007 and was ranked as Most Influential in Radiology by RT Image Magazine in 2008. In 2013 he was selected as the “Most Influential Radiology Researcher” by AuntMinnie.com.

Abstract

Functional CT Imaging of Myocardial Ischemia

Coronary artery disease (CAD) is the foremost single cause of mortality worldwide. The hemodynamic myocardial consequences of CAD can be assessed by myocardial perfusion imaging (MPI) which has traditionally been performed by positron emission tomography (PET), single-photon emission computed tomography (SPECT) or gadolinium-enhanced magnetic resonance imaging (MRI). With recent technical advantages, MPI can also be performed using computed tomography (CT), which provides additional information on anatomical information of the coronary arteries. This presentation will provide a comprehensive overview of the state of the art and future possibilities of functional CT in imaging of myocardial ischemia.
Speaker

Prof. Marc Dweck

(GBR)

Chair of Clinical Cardiology, University of Edinburgh

2020

Current posts

- British Heart Foundation Intermediate Clinical Research Fellow
- Consultant Cardiologist, University of Edinburgh (clinically active)
- British Heart Foundation. Project Grants Committee 2018-2021
- European Society of Cardiology Congress Program Committee 2019 and 2020
- Elected Member of the Board for the European Association Cardiovascular Imaging (EACVI)
- Chair EACVI Scientific Initiatives Committee
- EACVI Scientific Documents Committee
- EACVI Task Force Member on Multi-modality Imaging
- Editorial Board Circulation
- Editorial Board Circulation Cardiovascular Imaging
- Editorial Board Heart
- Editorial Board Journal of Nuclear Cardiology

Awards & Fellowships

- 2021 William W. Parmley Young Author Award, Journal American College of Cardiology (mentor)
- 2017 British Medical Journal Imaging Team of the Year
- 2016 Michael Davies Early Career Award, British Cardiovascular Society
- 2015 Sir Jules Thorn Award for Biomedical Research
- 2015 Queen’s Anniversary Prize for Higher and Further Education
- 2015 Winner British Heart Foundation Outstanding Investigator Award
- 2015 Winner, Young Investigator Award, American College Cardiology Scientific Sessions (senior author)
- 2015 University of Edinburgh “Rising Star” Chancellor’s Award
- 2014 Glaxo-Smith Kline Emerging Scientist of the Year, Academy of Pharmaceutical Sciences
- 2014 BMJ Awards.UK Research Paper of the Year, Runner up (senior author)
• 2013 Patrick Neil Medal. Early Career Prize, Life Sciences, Royal Society of Edinburgh
• 2013 Finalist The Lancet Prize, Young Investigator Award Academy of Medical Sciences
• 2012 William W. Parmley Young Author Award, Journal American College of Cardiology
• 2012 Winner, Young Investigator Award, American College Cardiology Scientific Sessions
• 2012 President’ Medal, Royal Society of Medicine
• 2011 Young Research Workers Prize, Radiology Society North America, Chicago, USA

Selected Research Grants
• BHF Clinical Research Training Fellowship Application FS/CRTF/20/24086. £231,336.69. 2021. Incidence, consequences and natural history of left ventricular thrombus after acute MI. Evangelos Tszolos. Primary Applicant
• British Heart Foundation BHF Special Project no. SP/20/3/35123. Joint funded with DZHK and DHF, Euro 1,107,255. 4 years. Quantitative-imaging in cardiac transthyretin amyloidosis (I-CARE). Primary Applicant
• BHF Research Excellence Award to the University of Edinburgh. £3,000,000. 2019 for 5 years. Primary Investigator for Theme 2 of the applications “Fibrosis and Calcification in Cardiovascular Disease”. Co-applicant
• BHF Infrastructure Grant IG/18/1/33458. March 2018 £700,000. “Funds to upgrade and expand a radiochemistry facility to deliver current and future cardiovascular PET research” Co Applicant
• BHF Clinical Research Training Fellowship FS/17/79/33226. October 2017. £120,628. 2 years
  Mhairi Doris. Combined PET and MR imaging of coronary atherothrombosis 1 year. Primary applicant
• BHF Programme Grant RG/16/10/32375. 2016. £1,796,358. 5 years. “Non-invasive Imaging of Human Coronary Atherosclerosis.” Co-Applicant.
• Sir Jules Thorn Award for Biomedical Research 2016. 15/JTA. £1,364,215. 5 years. Primary applicant
  Myocardial fibrosis and left ventricular decompensation in patients with aortic stenosis.
• BHF Intermediate Clinical Research Fellowship. FS/14/78/31020. £976,514. 2014 for 5 years. Primary Applicant
  Modification of calcification activity and 18F-Fluoride positron emission tomography uptake in cardiovascular disease.
• BHF Clinical Training Fellowship (FS/13/77/30488). Tim Cartlidge £294,956. 2013 for 3 years. Primary Applicant.
  18F-fluoride in the identification of bioprosthetic valve degeneration following
surgical and transcatheter implantation.

- Chief Scientist Office Project Grant ETM/365 £205,747. 2014 for 3 years. Co-applicant
  18F-Sodium Fluoride Imaging of Abdominal Aortic Aneurysms.
- Astrazeneca. ISSBRIL0250. £300,000. Dual antiplatelet therapy to Inhibit coronary Atherosclerosis and Myocardial injury in patients with Necrotic high-risk coronary plaque Disease: the DIAMOND study. Co-applicant
- British Heart Foundation Project Grant. PG/13/32/30205. £299,405. 2013 for 3 yrs. Co-applicant
  Development of a clinical translational model of arterial injury and repair to assess vascular stem cell therapies.
- Chief Scientist Office Project Grant ETM/266. £211,771. 2012 for 3 years. Co-applicant
  Identification of cellular inflammation in the myocardium using magnetic resonance imaging.
- British Heart Foundation Project Grant PG/12/8/29371. £251,525. 2012 for 3 years. Co-applicant
  Role of 18F-Sodium Fluoride imaging as a novel marker of plaque instability.
- British Heart Foundation Supplement to Clinical PhD Training Fellowship. £119,200. 2012 for 2 years.
  The Role of Fibrosis in Aortic Stenosis. Primary applicant
- Chief Scientist Office Project Grant ETM/160 £225,001. 2011 for 3 years. Co-applicant
  Novel imaging approaches to identify unstable atherosclerotic coronary plaques.
- British Heart Foundation Clinical PhD Training Fellowship FS/10/026 £280,048. 2010 for 3yrs. Primary applicant
  Role of inflammation and calcification in the progression of aortic stenosis: the ring of fire.

**Selected Publications (Pubmed 281 publications, h-index 53)**

- Everett RJ, Treibel TA, Fukui M, Lee H, Rigolli M, Singh A, Bijsterveld P, Tastet L,


- Chin CW, Shah AS, Vassiliou V, Cowell SJ, McKillop G, Boon NA, Prasad SK, Mills NL,
Newby DE, Dweck MR. Left Ventricular Hypertrophy with Strain and Aortic Stenosis. Circulation. 2014;130(18):1607-16


Abstract

Imaging coronary atherosclerotic plaque

We will discuss how CT can be used to assess patients presenting with chest pain and how this may evolve in the future with a focus on assessing coronary atherosclerotic plaque rather than ischaemia

Role of CT in the evaluation of heart valve disease

We will discuss how CT can be used to assess patients with aortic stenosis, both in terms of calcium scoring to assess disease severity and the planning of TAVI procedures. We will also discuss the emerging role in patients with endocarditis, and the planning of mitral valve disease procedures.
**Speaker**

**Dr. John Hoe**  
*(SGP)*

Consultant Radiologist, Mt Elizabeth Hospital, Singapore and MediRad Associates Ltd, Singapore  
Email: johnhoewm@gmail.com

**Subspeciality interest in cardiovascular imaging:**

Has been performing cardiac CT since May 2004. Organiser of an annual CT Coronary Angiography Teaching Course since Oct 2004, held in Asia and Australia.  
Has given more than 250 lectures on cardiac CT in Asia, Europe, USA and Australia and presented scientific papers on cardiac CT in major international meetings. Has published more than 30 papers in international peer reviewed journals on cardiac CT.  
Local Principal investigator in 2 major international multicentre trials on cardiac CT: CorE64 stenosis and CorE320 myocardial perfusion  
Founding member of Asian Society of Cardiac Imaging (ASCI)  
Past President of Asian Society of Cardiac Imaging (ASCI)-2013 to 2015

**CTA interpretation: CAD RADS® and beyond**

This talk will discuss how to use CAD RADS for reporting CTA scans for coronary stenosis and how this affects management of the patient. The talk will discuss the difficulty of quantifying the degree of stenosis so as to be able to use the CAD RADS reporting system and how to avoid false positive results. Also how to manage the patient even if the CTA is reported as showing mild stenosis but patients clinical symptoms are significant, so as to avoid false negative CTA result. In addition the need for functional significance of the disease seen in the coronary arteries need to be considered and role of using CT Myocardial perfusion study or FFR-CT using onsite software to improve CAD RADS reporting will be discussed.

**Abstract**

**CTA interpretation: CAD RADS® and beyond**
DAY 1 - AUGUST 19 (THURSDAY) / CHANNEL 1

16:00 - 17:30 (GMT + 7)

ASCI meets ESCR
Prevention of cardiovascular disease

Chairperson(s)

Prof. Yung-Liang Wan (TWN)
Prof. Natale Luigi (ITA)

Speaker/Lecturers

Prof. Yung-Liang Wan (TWN)  Prof. Jongmin Lee (KOR)  Prof. Natale Luigi (ITA)  Prof. Marco Francone (ITA)

16:00  Significance and assessment of coronary artery calcification on non-gated non-enhanced chest CT image
       Prof. Yung-Liang Wan (TWN)

16:20  CT screening of CAD in high-risk patients
       Prof. Jongmin Lee (KOR)

16:40  CMR screening of CAD in high-risk patients
       Prof. Natale Luigi (ITA)

17:00  CMR screening of genetic hypertrophic cardiomyopathy (HCMP)
       Prof. Marco Francone (ITA)
**Speaker**

**Prof. Yung-Liang Wan**

*(TWN)*

Honorable Professor of Radiology, College of Medicine, Chang Gung University.

Consultant Radiologist at the Department of Medical Imaging and Intervention, Linkou Chang Gung Memorial Hospital in Taiwan.

President of Asian Society of Cardiovascular Imaging (ASCI) (2019/03 to 2021/08)

Email ylw0518@cgmh.org.tw

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**Education and Training:**

Wan-Hua Primary High School (1968/02 to 1970/06),

Chen-Ko Secondary High School (1970/09 to 1973/06),

College of Medicine, National Taiwan University, (1973/09 to 1980/06).

Completed four years of Resident training in 1984 and one year of Fellowship in 1985 at the Department of Medical Imaging and Intervention, Linkou Chang Gung Memorial Hospital, Chang Gung University.

A Research Fellow of Diagnostic Ultrasonography in 1985 at Dept. of Diagnostic Radiology, Mount Sinai Hospital and Mount Sinai School of Medicine, City University of New York, U.S.A.

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**Board Certification:**

5. Fellow of Society of Cardiovascular Computed Tomography (FSCCT) (USA) (2020)

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**Professional Experience:**

1. Chairman of the Department of Medical Imaging and Intervention, Linkou Chang Gung Memorial Hospital for 18 years (1993 to 2011).
2. Director of the Department of Medical Imaging and Radiological Sciences (MIRS), College of Medicine, Chang Gung University for 23 years (1995 to 2019).
**Research Interest:**
Ultrasonography, Cardiothoracic imaging, Image-guided intervention.

**Academy and Publications:**
An editor of one book, contributor of 6 book chapters, has published 344 peer-reviewed papers (70% in journals cited by SCI), and has been invited to deliver 73 domestic lectures and 99 speeches in international meetings.
A reviewer of 22 medical journals.

**Academic Contributions:**
(1) President/Organizer of 12 international Congresses
(3) A member of International Visiting Professor (IVP) Program in 2019 recommended by the AOSR and RSNA.
(4) Associate Editor of J Thoracic Imaging (an official journal of Society of Thoracic Radiology, USA) (2019 to 2021)
(5) Co-Editor-in-Chief of J Radiological Sciences (an official journal of TRS)
(6) An Editorial board member of Cardiovascular Imaging Asia (an official journal of ASCI).
(7) Reviewer of 23 domestic and international journals.

**Awards and Honor:**
19. **Professional Affiliations:**
(1) Immediate past President of Asian Society of Thoracic Radiology (ASTR) (2015/03 to 2019/07)
(2) Councilor (2007/11 to 2010/10), Treasurer (2014/07 to 2016/05), Secretary (2016/06 to 2018/05) and President elect (2018/05 to 2020/08) of AFSUMB.
(3) Founding president and president (2013/11 to 2016/11) of Taiwan Society of Medical Imaging and Radiological Sciences (TSMIRS)
(4) Standing Board Director of the Taiwan Radiological Society (TRS) (2013/04 to 2019/03).
Board Director of the TRS (2007/04 to 2013/03).
(5) Executive Committee member of ASCI, 2009-2015.
(6) Steering Committee Member of ASTR (2006/06 to 2013/05).
(7) Vice President of TRS (2004/04 to 2007/03).
(8) President of Taiwan Society of Ultrasound in Medicine (TSUM) (2002/11 to 2004/10).
(9) A member of the Radiological Society of North America, ARDMS, SCCT, ASCI, Formosan Medical Association, TRS and TSUM.

**Selected Recent Publications in either the First or *Corresponding authors:**


(6) Comparison of the left main coronary bifurcating angle among patients with normal, non-significantly and significantly stenosed left coronary arteries. Scientific Report. 2017;7:1515. (SCI)


Abstract

Significance and assessment of coronary artery calcification on non-gated non-enhanced chest CT image

Cardiovascular disease including coronary artery disease (CAD) and malignant neoplasms account for the two main causes of death worldwide. The predictors of incident CAD include coronary artery calcification (CAC), Framingham risk factors, ankle-brachial index, high-sensitivity C-reactive protein and family history. However, the presence and extent of CAC detected and localized by CT have been found to be independent predictors of cardiovascular events.

Lung cancer is the leading global cause of cancer-related death. Current five-year survival estimated for non-small cell lung cancer ranges from 73% for Stage IA disease to 13% for Stage IV disease. The identification of patients with lung cancer in early stages is associated with better prognosis for disease-free survival. In the past decades, low dose computed tomography (LDCT) has been used as a screening tool for the early detection of lung cancer in large clinical trials and can reduce lung cancer mortality by up to 20%.

Both CAD and lung cancer causes significant patient morbidity and mortality with a great financial burden throughout the world. Thus, devising a reliable and clinically feasible diagnostic modality for the early and simultaneous detection of lung cancer and CAD is a critical issue in promoting healthcare.
ECG-gated cardiac CT has been used to identify and quantify CAC. Non-gated, non-contrast chest CT is used for lung cancer screening and assessment of various thoracic diseases. In this presentation, the following issues will be discussed: (1) The prognostic value of CAC in asymptomatic and symptomatic patients. (2) The limitations and methods of CAC scoring (CS). (3) Visual assessment of CS on non-gated CT; and (4) factors that may affect the CT number of CAC or CS on chest CT, these include CT scanning without or with ECG-gating, slice thickness, scanned field of view, tube voltage, observers’ variability, image noise, motion artifact, partial volume effect, image reconstruction algorithm or convolution kernel.
Speaker

Prof. Jongmin Lee
(KOR)

Professor of Radiology & Biomedical Engineering
Director of Radiology Department, School of Medicine, Kyungpook National University
Member of Vascular Anomaly Clinic and Hemodynamics Study Group

Email jonglee@knu.ac.kr

Carrier

- Instructor - Professor of Radiology, School of Medicine, Kyungpook National University, Daegu, South Korea (1997–present)
- Ph.D. degree; School of Medicine, Hamamatsu University, Hamamatsu, Shizuoka, Japan (2007)
- Head, Department of Diagnostic Radiology, Capital Armed Forces General Hospital, Seoul, South Korea (1994–1997)
- Radiology Training, Kyungpook National University Hospital, Korea (1990-1994)
- Medical course, School of Medicine, Kyungpook National University, Daegu, South Korea (1983-1989)

Subspecialty Cardiovascular Radiology,

- Interventional Radiology: Congenital Vascular Anomaly,
- Biomedical Engineering: Hemodynamics,
- Musculoskeletal Radiology

Academic Society Service

Korean Academy of Medical Science (KAMS): Director of international affairs
- The Korean Medical Association (KMA) House of Delegates: Delegate
- Asian Oceanian Society of Radiology (AOSR): Honorary treasurer
- Korean Society of Radiology (KSR): Auditor
- Korean Society of Ultrasound in Medicine (KSUM): Councilor
- Asian Society of Cardiovascular Imaging (ASCI): Vice-president
- The Korean Society of Cardiology (KSC): Councilor
- Korean Society of Cardiovascular Imaging (KOSCI): Auditor
• Korean Society of Magnetic Resonance in Medicine (KSMRM): Member
• Radiological Society of North America (RSNA): Member
• The Korean Society of Medical & Biological Engineering (KOSOMBE): Member
• International Magnetic Resonance Angiography Conference (MRA Club): Member
• European Society of Radiology (ESR): Member
• International Society of Magnetic Resonance in Medicine (ISMRM): Member

Public Society Service
• Medical and clinical training center (Medi-CT Center)
• Industrial Accident Compensation Insurance Review Committee
• Food and Drug Safety Evaluation Center: Medical Device Clinical Specialist
• Electronics and Telecommunications Research Institute Daegu
• Medical ICT Convergence Expert Management Committee, National Evidence-based Healthcare Collaborating Agency

Journal Editorial

Academic Achievements
• Researches: 23 Government-led research projects
• Registered Software (SORS): 24 items
• Patents: 20 registered items
• 8 Textbooks (7 Chapters, 1 book)
• Articles in Peer-reviewed Journal: 100 SCI(E) and 64 KSCI(E)
• 195 Scientific Presentations & Lectures in Official Congresses
Abstract

CT Screening of Coronary Artery Disease in High-risk Patients

The high-risk patients of coronary artery disease can be defined as having high LDL cholesterol, low HDL cholesterol, high blood pressure, family history of cardiovascular events, diabetes mellitus, smoking history, post-menopausal state, old age, and obesity. The high-risk patients can present diverse clinical expressions of coronary artery disease including chest pain syndrome, acute chest pain, atypical chest pain, dyspnea, and asymptomatic.

Cardiac CT has been developed and applied in the screening process for coronary artery disease in recent decades of years. In around 2010, major international societies including ASCI published the appropriateness criteria for application of cardiac CT to screen coronary artery disease. In these guidelines, asymptomatic high-risk patients are regarded as appropriate candidates for the cardiac CT. However, in case of evident clinical expression, high-risk and high pre-test probability patients are not recommended for cardiac CT since the other classical methods are praised as methods of choice in clinical routine.

In this lecture, I would like to discuss the potentials of cardiac CT to improve medical practice for high cardiovascular risk patients.
Speaker

Prof. Natale Luigi

(ITA)

Born in Caserta, Italy, 10/02/1960.

Medical degree in 1985, board certified in Radiology in 1989, in Catholic University of Rome.

Fellow and then assistant professor of Radiology in Radiology Dept. of the same University.

In 1991 he attended Cardiac MR unit of Royal Brompton Heart and Lung Insitute of London, UK, for six months.

Then he attended cardiac MR courses of American Heart Association in 1995 and 1997 and cardiac MR course of European Heart Association in 1996.

In 2001 he visited the cardiac MR unit of University of Alabama at Birmingham, USA, directed by dr. Gerald Pohost.

Chief of cardio-vascular MR unit of Catholic University of Rome from 1997 to 2011.

Head of Radiology Department in Centro Oncologico Fiorentino of Florence from 2011 to 2013.

Head of Emergency Radiology Unit in Policlinico A. Gemelli since May 2018.

Professor of Cardiac Radiology in Radiology, Cardiology and in Cardiac Surgery post-graduate Schools of Catholic University of Rome.

Professor of Cross-Section Imaging Anatomy from 2008 to 2012 and Imaging Contrast Media from 2017, in School for Radiographers of Catholic University of Rome.

Author of 106 papers published on indexed journals, 4 books, 12 chapters of books.

Speaker and presenter in many national and international congresses, workshops and courses, mainly in cardiac imaging field.

Member of many international scientific Society: RSNA, ARRS, ESR, ESMRMB, AHA, SCMR, SCCT, NASCI, ESCR, ESTI.

Active member of cardiac imaging group of Italian Society of Medical Radiology (SIRM).

Past president of Cardiac Radiology Working Group of the Italian Society of Cardiac Radiology (SIRM).

Previous chief of the Educational Committee, then secretary, then deputy president
and finally President of the European Society of Cardiovascular Radiology (ESCR).
Member of the Educational Exhibit Cardiac Subcommittee of Radiological Society of
North America from 2011 to 2014.
Fellow of the North American Society of Cardiovascular Imaging since 2020.
Chair of Cardiac Radiology Committee in the 2012 European Congress of Radiology.
Reviewer of many indexed scientific journals (La Radiologia Medfica, European Journal
of Radiology, European Radiology, Insights into Imaging, Journal of Cardiovascular
Associate Editor of the International Journal of Cardiovascular Imaging.
Member of the Advisory Editorial boards of European Radiology, European Radiology
Experimental and Insights into imaging.
Body CT and MRI, Chest Radiology, Cardiac Radiology, Oncologic Radiology and
Emergency Radiology are his fields of interest in clinical practice.
His research field is mainly represented by cardiac imaging (with focus on ischemic
heart disease, cardiomyopathies and valvular heart diseases), oncologic imaging (with
focus on perfusion and diffusion MRI for the treatment response assessment) and
emergency radiology.

Abstract

CMR screening of CAD in high-risk patients
Speaker

Prof. Marco Francone

(ITA)

Professor of Radiology at Humanitas University in Milan (Italy).

He has been frequently invited since years to lecture at major radiological and cardiological conferences such as ESOR, SCMR, ESCR, CIRSE, RSNA, and ECR. At RSNA he lectured at refresher courses for the last three consecutive years, moreover he was Radiographics panelist and member of the Educational Exhibit Awards committee.

His research is dedicated to cardiovascular imaging with CT and MR with specific focus on coronary artery disease, myocardial infarction and cardiomyopathies. He authored more than 100 indexed papers with an impact factor higher than 500. He chairs the scientific committee of the European Society of Cardiovascular Radiology and serve the board of Trustee of the Society of Cardiovascular Magnetic Resonance and acted as Past President Italian College of Cardiac Radiology.

Marco Francone is active in national and international imaging societies. He is member of the Editorial Board of European Radiology as cardiac imaging section chief, European Journal of Radiology, International Journal of Cardiovascular Imaging, and Radiologia Medica.

He supports ESR as cardiac imaging subcommittee member and incoming chairperson, moreover he is appointed to the ESR Research Committee.

Marco Francone seeks to advance cardiovascular imaging technology and to educate physicians in its use with the ultimate goal to provide optimal outcome for our patients. He is a strong advocate of a fruitful cooperation between Radiologists, Cardiologists and Physicists towards this goal.
Abstract

CMR screening of genetic hypertrophy cardiomyopathy (HCMP)

Genetic hypertrophic cardiomyopathy (HCMP) is the most common inheritable cardiovascular disorder.

Although many patients remain asymptomatic, sudden death (SD) can occur as the initial manifestation of the disease together with the variable presence of major arrhythmic disorders. It has been hypothesized that myocardial disarray and scarring represent the pathological electrophysiological substrate that creates susceptibility to malignant ventricular arrhythmias. Cardiovascular magnetic resonance imaging (CMR) is widely used for the diagnosis of HCMP, especially in patients with an incomplete or inconclusive echocardiography study. CMR can provide precise non-invasive assessment of biventricular function, wall thickness, and assessment of myocardial fibrosis, using a multiparametric approach based on inversion recovery gadolinium-enhanced and T1/T2 mapping sequences. CMR is also one of the most promising avenues of research in HCMP, and in recent years, has provided many new insights and identified a number of potential adverse prognostic indicators for SD. Future work is still needed to integrate CMR findings into traditional risk assessment algorithms. This lecture will focus reviews the evolving role of CMR for screening and risk stratification in including assessment of myocardial hypertrophy, fibrosis and ischaemia.
16:00 - 17:30 (GMT + 7)

**Educational Course 1**

*How to do CMR*

**Chairperson(s)**

- A/Prof. Hoang Minh Loi (VNM)
- Prof. Yeon Hyeon Choe (KOR)

**Speaker/Lecturers**

- Dr. Nguyen Ngoc Trang (VNM)
- Prof. Hyun Woo Goo (KOR)
- Dr. Shihua Zhao (CHN)
- A/Prof. Hoang Minh Loi (VNM)

**16:00**
CMR sequences: from physics to clinical applications  
*Dr. Nguyen Ngoc Trang (VNM)*

**16:20**
Functional Analysis: LV and RV  
*Prof. Hyun Woo Goo (KOR)*

**16:40**
The role of CMR in heart failure  
*Dr. Shihua Zhao (CHN)*

**17:00**
Late gadolinium enhancement and cardiomyopathy  
*A/Prof. Hoang Minh Loi (VNM)*
Speaker

Dr. Nguyen Ngoc Trang (VNM)
Radiology Center, Bach Mai Hospital
Email drnguyenngoctrang@gmail.com

Education
1999 – 2005: Hanoi Medical University (Subject: General Doctor)
2009 – 2010: Resident Doctor of Radiology at Clermont Ferrand University Hospital, France
6 - 9/2012: Observer of Radiology at University of Sydney and Westmead Hospital, Australia
2016 - 9/2016: Fellow of Radiology at Rouen University Hospital, France
2018 - 2021: Ph.D. at Taipei Medical University, Taiwan.

Diploma
2005 General Doctor
2009 Resident Doctor of Radiology at Hanoi Medical University
2010 Resident Doctor of Radiology at Clermont Ferrand University Hospital, France

Experience records
2011 – 2021: Took part in the editing of books and documents for teaching at Hanoi Medical University, Bach Mai College of Medicine.
Took part in teaching at the Hanoi Medical University, Bach Mai College of Medicine.
Participated in national and international conferences: VSRNM, ASCI, AAR, APCVSIR, KSR, ESR.

Bibliography


**Abstract**

**CMR sequences: from physics to clinical applications**

MRI is non-invasive and free of radiation and helpful for the diagnosis and management of cardiovascular diseases. This presentation introduces basic physical principles of CMR acquisition: spin-echo (double inversion, black-blood) and gradient echo-based pulse sequences. Those basic techniques can be optimized for clinical practices to assess cardiovascular morphology, ventricular function, myocardial perfusion, tissue characterization.
**Speaker**

**Prof. Hyun Woo Goo**

(KOR)

Department of Radiology  
Asan Medical Center, University of Ulsan College of Medicine  
Email hwgoo@amc.seoul.kr

**Education Background**

1983 – 1986  Hansung High School, Seoul, Korea  
1986 – 1992  M.D., Catholic University College of Medicine, Seoul, Korea  
1994 – 1996  M.S., Ulsan University College of Medicine, Seoul, Korea  
1996 – 2001  Ph.D., Ulsan University, College of Medicine, Seoul, Korea

**Professional Career**

2002 - 2004  University of Ulsan College of Medicine, Seoul, Korea  
Instructor of Radiology  
2004 – 2008  University of Ulsan College of Medicine, Seoul, Korea  
Assistant Professor of Radiology  
2008 – 2013  University of Ulsan College of Medicine, Seoul, Korea  
Associate Professor of Radiology  
2013 – Present  University of Ulsan College of Medicine, Seoul, Korea  
Professor of Radiology

**Publications (the latest 5 articles)**

Goo HW. Radiation dose, contrast enhancement, image noise and heart rate variability of ECG-gated CT volumetry using 3D threshold-based segmentation: Comparison between conventional single scan and dual focused scan methods. Eur J Radiol 2021 Apr;137:109606.  
Abstract

Functional Analysis: LV and RV

MRI plays a key role in evaluating LV and RV function. Quantitative evaluation rather than qualitative or visual evaluation is current standard. The ventricular function can be evaluated globally or regionally. In this presentation, the methodologies used for global and regional LV and RV function will be described. In the assessment of global function, different data acquisition methods, segmentation methods, and user interaction during post processing are used to measure ventricular volume and mass, which significantly influence accuracy and reproducibility of the results. Various measures, including ventricular volumes, ejection fraction, stroke volume, RV/LV volume ratio, myocardial mass, and mass-to-volume ratio, may be used to represent global cardiac function. Recently, artificial intelligence-based algorithms are actively testing to improve clinical workflow as well as to increase accuracy and reproducibility of the results. Various quantitative techniques, including tissue tagging, phase velocity mapping, DENSE, SENC, and feature tracking, may be used to evaluate regional LV and RV function.
Speaker

Dr. Shihua Zhao
(CHN)

Abstract

The role of CMR in heart failure
Abstract

Late gadolinium enhancement and cardiomyopathy
8:30 - 10:00 (GMT + 7)

ASCI meets SCCT

CT Functional assessment of CAD

Chairperson(s)

Dr. Kakuya Kitagawa (JPN)
Prof. Koen Nieman (USA)

Speaker/Lecturers

Prof. Suhny Abbara (USA)
Dr. Hyung-bok Park (KOR)
Dr. Teruhito Mochizuki (JPN)
A/Prof. Koen Nieman (USA)

8:30  Spectral detector CT for cardiovascular applications  
      Prof. Suhny Abbara (USA)

8:50  CT-FFR: Opportunities and challenges  
      Dr. Hyung-bok Park (KOR)

9:10  CT-Perfusion: Current status  
      Dr. Teruhito Mochizuki (JPN)

9:30  Plaque quantification: Hype or Hope?  
      A/Prof. Koen Nieman (USA)
Speaker

Prof. Suhny Abbara
(USA)
University of Texas Southwestern Medical Center
Parkland Health and Hospital System

Education
Dr. Abbara received his medical degree from Heinrich Heine University in Düsseldorf.

Post-Graduate Education
After medical school, Dr. Abbara completed his Radiology Residency at Georgetown University and Cardiac Imaging Fellowship at Massachusetts General Hospital, and Harvard Medical School.

Academic Appointments
Dr. Abbara was Assistant Professor then Associate Professor of Radiology at Harvard Medical School. He also served as Director of Clinical Cardiac Imaging at Massachusetts General Hospital and Director of Education for the Cardiac Magnetic Resonance and Computed Tomography Program. He currently is Professor and Division Chief of the Cardiothoracic Imaging Division at UT Southwestern and Chief of Cardiothoracic Imaging at Parkland Health and Hospital System.

Professional Affiliations and Scientific Publications
Dr. Abbara is the Editor-in-Chief of the RSNA Journal Radiology: Cardiothoracic Imaging and has been an Associate Editor of the Journal of Cardiovascular Computed Tomography (JCCT), Editor of the Cardiac Imaging section of the Year Books of Diagnostic Radiology, and has been an Editor, or on the editorial board or ad-hoc reviewer for more than a twenty scientific journals. He has served as the President of the Society for Cardiovascular Computed Tomography (SCCT), and is past President of the Certification Board for Cardiovascular Computed Tomography.

He has published more than 310 original manuscripts in peer reviewed journals, several book chapters and edited five major textbooks on Cardiovascular Imaging in multiple editions.
Abstract
Spectral detector CT for cardiovascular applications

In this presentation Dr. Abbara will discuss the various types of source based and detector based spectral CT technology. This includes Sequential Scans, Rapid kV switching, Dual source CT, TwinBeam CT, and Spectral Detector CT.

CT fingerprinting where the 1 dimensional Hounsfield scale is transferred into a 2-dimensional material attenuation decomposition plot is discussed and its potential is illustrated.

Recent literature specific to SDCT and spectral derived reconstructions is discussed.

Among the spectral derived data are:
- Iodine no Water [mg/ml*]
- Iodine Density [mg/ml]
- High and Low Mono-energetic reconstructions ranging from 40 to 200 keV
- Z Effective
- VNC [HU*]
- Iodine Enhanced Structures [HU]
- Uric Acid [HU]

The specific use of low monoE and high monoE images, Iodine maps, Iodine quantification, ECV quantification are discussed and illustrated with recent publications.

Finally, an demonstration of potential future contrast use is illustrated on an animal model.
Speaker

Dr. Hyung-bok Park
(KOR)

Assistant Professor
Division of Cardiology, Department of Internal Medicine,
International St. Mary’s Hospital, Catholic Kwandong University College of Medicine
Simgokro 100gil 25 Seo-gu, Incheon, South Korea

Email  hyungbok7@gmail.com

Medical Education
M.D: Catholic Kwandong University College of Medicine, Korea 03/1999 - 02/2006
M.S: Catholic Kwandong University College of Medicine, Korea 03/2009 - 06/2011

Membership and Honorary/Professional Societies
The Korean Association of Internal Medicine
The Korean Society of Cardiology
Korean Society of Echocardiography
Korean Society of Interventional Cardiology
Editorial Board Member for Journal of Cardiovascular Imaging

Examinations
Korean Medical License Examination 01/2006
Korean Internal Medicine Board Examination 02/2012
Certification Board of Cardiovascular Computed Tomography (USA) 09/2012
Korean Certification Board of Echocardiography 03/2014
Subspecialty Board of Cardiology 03/2015

Work Experience
Assistant Professor, Division of Cardiology, 03/2014 – Current
Department of Internal Medicine, International St. Mary’s Hospital,
Catholic Kwandong University College of Medicine,
Seo-gu, Incheon, Korea

Assistant Professor, Division of Cardiology, 03/2014 – 08/2017
Cardiovascular center, Myongji Hospital,
Hanyang University College of Medicine
Goyang-si, Gyeonggi-do, Korea

Clinical Fellow, Department of Cardiology, 03/2013 - 02/2014
Severance Cardiovascular Hospital,
Yonsei University College of Medicine,
Seoul, Korea

Cardiac Imaging Fellow, 03/2012 - 02/2013
Cedars-Sinai Medical Center,
Los Angeles, California, United States

Residency, Department of Internal Medicine, 03/2008 - 02/2012
Myongji Hospital, Kwandong University College of Medicine
Goyang, Gyeonggi-do, Korea

Internship, Myongji Hospital, 03/2007 - 02/2008
Kwandong University College of Medicine
Goyang, Gyeonggi-do, Korea

Publications


Abstract

CT-FFR: Opportunities and challenges

Fractional flow reserve (FFR) is currently the gold standard for detection of lesion-specific myocardial ischemia. Prior studies have demonstrated that ischemia-causing lesions detected using FFR portend poor prognosis. Furthermore, FFR-guided percutaneous coronary intervention (PCI) has shown survival benefits as compared to invasive coronary angiography (ICA) guided PCI alone.

Coronary computed tomography angiography (CTA) is a noninvasive method for accurate detection and exclusion of high-grade coronary stenoses when compared to ICA, hence it may serve as a gatekeeper for invasive catheterization. However, CTA tends to overestimate the severity of coronary artery stenosis resulting in low specificity and positive predictive values.

Non-invasive CTA derived FFR, which applies computational fluid dynamics (CFD) onto a three dimensional (3D) coronary lumen geometry derived from CTA, has demonstrated high diagnostic accuracy as well as improved specificity and positive predictive values according to three prospective multicenter trials. Ultimately, this novel technique allows for comprehensive anatomic and physiologic diagnosis of coronary artery disease (CAD).

However, the currently established non-invasive FFR technique has several major limitations when applied to day-to-day clinical practice. The required simulation has to be performed outside of the hospital because it necessitates a supercomputer, therefore requiring transfer of patient data potentially leading to exposure of personal patient information. Furthermore, the processing time could take several hours, and the service could be associated with significant cost.

Recently introduced several on-site CTA derived FFR techniques have been shown to have high diagnostic accuracies. These alternatives comprise but a fraction of the published CT derived FFR literature and their effects on treatment decisions and costs have not been evaluated in clinical settings. Moreover, they are not FDA approved and their subsequent availability and commercialization may be limited by intellectual property issues.
Speaker

Dr. Teruhito Mochizuki

(JPN)

Emeritus Professor, Department of Radiology,
Ehime University School of Medicine, Ehime, JAPAN
Professor, Radiology, Sechenov First Moscow State Medical University, Moscow Russia

Email tmochi616@m.ehime-u.ac.jp

Professional Appointments

1983.4 Chief, Radiology Ehime Imabari Hospital Japan
1989.7 – 1991.7 Research Associate Department of Radiology University of Pittsburgh, PA USA
2004.1 – present. Professor and Chairman Department of Radiology, Ehime Univ.
School of Med, Ehime Japan
2018 – present (2021) Professor, Radiology, Sechenov First Moscow State Medical University, Moscow Russia
2020.4 - present (2021) Emeritus Professor, Department of Radiology, Ehime University School of Medicine, Ehime, JAPAN

Certifications

1980 Board certification in medicine (#251694)
1987 Board certification as radiologist (#794)
1991 Board certification as Nuclear Physician (#100400)
1991 Ph.D. (Ehime University #144)

Memberships (Associations / Societies)

1980- Japanese Radiological Society (JRS)
1980- Japanese Society of Nuclear Medicine (JSNM)
1990- Radiological Society of North America (RSNA)
2006- Society of Cardiovascular CT (SCCT)
2007 - Society of Cardiac CT (SCCT) Japan International Regional Committee,
2007- Asian Society of Cardiovascular Imaging (ASCI)
2009- Japanese Society of Cardiovascular Imaging and Dynamics (JSCVD)
2011- Japanese Society of Magnetic Resonance (JSMR)
2015- Society of Nuclear Medicine (SNM)
Abstract

CT-Perfusion: Current status

Now, Cardiac CT is a tool not only for morphology but also a functional or physiological assessment. In the clinical treatment of patients with coronary artery disease (CAD), functional or physiological assessment such as myocardial ischemia is important to obtain better prognosis in the individual patient, i.e., tailor-made treatment. Stress/rest myocardial perfusion SPECT has been used to assess myocardial ischemia in CAD patients. Stress(rest) CT and MR can also evaluate myocardial ischemia in the same manner of SPECT with higher spatial resolution.

Since 1996, i.e., the era of single helical CT, we have been intensively investigating potential use of CT for myocardial perfusion assessment, proposing ATP-stress myocardial perfusion CT (CTP) to depict myocardial ischemia on stress. There are two ways to perform CTP, i.e., one is 1-phase contrast imaging, and the other is dynamic acquisition. Both methods can depict stress-induced myocardial ischemia with contrast enhancement CT. When whole heart dynamic CTP is applied, quantitative value of myocardial blood flow (ml/g-myocardium/min) can be generated. The MBF value can be fused to coronary CTA in 3D fashion, which can quantitatively assess MBF of each coronary branch. This is useful to make treatment decision of the coronary stenosis.

In this presentation, recent status of CT-Perfusion in clinical use, showing instructive cases.
Speaker

A/Prof. Koen Nieman
(USA)

Radboud University, Nijmegen, The Netherlands
Erasmus University Medical Center, Rotterdam, NL
Harvard University, Massachusetts General Hospital, Boston, MA
Erasmus University Medical Center, Rotterdam, NL

Personal Statement

My research focused on development and validation of advanced cardiac imaging technology and optimization of diagnostic strategies for the management of cardiovascular disease. As a PhD graduate student, I took advantage of the technical potential of the first multislice spiral CT systems to noninvasively image the coronary arteries, which resulted in several highly cited publications. After my cardiology training, which included an imaging fellowship at the Massachusetts General Hospital (Harvard Medical School), I eventually succeeded my mentor as director of advanced CV imaging research, a successful collaboration between the departments of Cardiology and Radiology at the Erasmus University. As part of an internationally recognized cardiac imaging group, I was able to initiate and lead several multicenter, randomized controlled trials to investigate the clinical value of cardiac CT in patients with stable angina (CRESCENT; CRESCENT 2) and acute chest pain in the emergency room (BEACON), as well as randomized trials to compare scanner technology and contrast enhancement protocols (CT-CON, IsoCOR). In 2013 I received funding from ZonMw (Dutch equivalent of NIH) to perform the CRESCENT 2 trial. As coordinator of the cardiac CT corelab at Cardialysis Inc. at Cardialysis (CRO) I supervised the performance and evaluation of cardiac CT for several international trials including ABSORB (biodesorbable coronary scaffolds) and ADVANCE (TAVR). In 2014, I received the established clinical investigator award from the Dutch Heart Foundation, to support my research on functional applications for cardiac CT. We studied the value of dynamic myocardial perfusion CT as well as CT-based fractional flow in pre-clinical and clinical studies, in collaboration with the Biomedical Informatics and Biomedical Engineering departments at Erasmus MC. In 2016, I relocated to California, to continue my cardiovascular imaging research at Stanford University, with a specific interest in diagnostic innovations at the interface of medicine and computer science. I lead the SPECIFIC trial: an international validation study of CT myocardial perfusion imaging, as well as an international consortium to investigate the performance of an onsite performed
CT-fractional flow reserve application developed through machine-learning (MACHINE consortium). I also serve as co-PI for the HeartFlow ADVANCE registry to study the clinical implementation of CT-FFR using an application based on computational fluid dynamics. In 2017, I am on the executive board of the Society of Cardiovascular CT as president-elect, and serve on the editorial board of JACC CV Imaging.

**Positions and Honors**

**Positions and Employment**

- **2000-2003**  
  PhD graduate student cardiac imaging, Erasmus University Medical Center.

- **2003-2004**  
  Internal Medicine Residence, Havenziekenhuis/Erasmus Medical Center, Rotterdam, NL

- **2004-2005**  
  Cardiovascular Imaging Fellowship, Harvard University, Massachusetts General Hospital, Boston, MA

- **2005-2008**  
  Cardiology Fellowship, Erasmus University Medical Center, Rotterdam, NL

- **2008-2011**  
  University Medical Specialist, Cardiology, Erasmus University Medical Center, Rotterdam, NL

- **2011-2013**  
  Assistant Professor Cardiology / Radiology, Erasmus University Medical Center, Rotterdam, NL

- **2012-2014**  
  Medical Coordinator intensive cardiac care unit, Erasmus Medical Center, Rotterdam, NL

- **2013-2016**  
  Associate Professor Cardiology and Radiology, Erasmus Medical Center, Rotterdam, NL

- **2016-**  
  Honorary Associate Professor Cardiology / Radiology, Erasmus Medical Center, Rotterdam, NL

- **2016-**  
  Associate Professor Medicine (Cardiology) and Radiology, Stanford University, CA

**Other Experience and Professional Memberships**

- **2006-2016**  
  Clinical coordinator, Cardiac CT Corelab, Cardialysis, Rotterdam, NL

- **2008-2010**  
  Section editor CT, Reviews in Cardiovascular Imaging

- **2009-2015**  
  Member, secretary, chair (2012-15), NVVC WG Cardiac CT, MRI and Nuclear Imaging

- **2009-2016**  
  Board, program committee, Dutch Institute for Cardiovascular Education (CVOI)

- **2010-2016**  
  Nucleus member, secretary, (ESC) EACVI section cardiac CT and nuclear imaging

- **2013-2016**  
  Board member, Netherlands Vascular Forum (formerly NVVG)

- **2013-**  
  Visiting professor, cardiac imaging, Svendborg Hospital, Odense
University, DK
2014- Program committee Annual Scientific Meeting (currently chair), Society of Cardiovascular CT
2015- Board member (currently president-elect), Society of Cardiovascular CT
2015-2018 Associate editor, Journal of Cardiovascular CT
2017- Associate editor, JACC cardiovascular imaging

Honors & awards
1998 Japan Prizewinners Program, Dutch Ministry of Education.
2003 PhD cum laude.
2004 Stipend for fellowship at Massachusetts General Hospital, ICIN.
2008 Erasmus MC Fellowship [grant for research on cardiac CT in the ED]
2009 ESC Fellowship, European Society of Cardiology
2009 Paludanus award (for best clinical innovations) for the fast-track chest pain clinic, Unive.
2014 Established Clinical Investigator award, Dutch Heart Foundation.

Contributions to Science

1. Pioneered use of coronary CT angiography. In the earlier 2000s we were the first to demonstrate the ability of multislice spiral CT angiography to detect obstructive CAD. Subsequent studies focused on optimization and clinical application of CT angiography, leading to several multicenter trials, which established how coronary CT angiography is used in cardiovascular medicine today.

2. Demonstrated the clinical value of cardiac CT. As CT angiography technologically matured, the next step was to establish its clinical and economic value techniques in different clinical scenarios. Based on analysis of registry data and cost-effectiveness analyses, we designed diagnostic algorithms for optimized effectiveness and efficiency, and subsequently performed three multicenter, randomized clinical effectiveness trials. CRESCENT 1 (PI: Nieman) demonstrated that in patients with stable CAD, CT angiography could improve clinical outcome at lower cost compared to standard care. BEACON (PI: Nieman) demonstrated
that in patients with acute chest pain CTA was safe and cost-effective, but could not as earlier reported shorten observation times after the introduction of high-sensitivity troponins. CRESCENT 2 (PI: Nieman) shows that a tiered, cardiac CT protocol, including myocardial perfusion imaging, was time-efficient and provided comprehensive information for subsequent management in patients with stable chest pain. These studies substantially contributed to the evidence base for clinical use of cardiac CT in the care of patients with suspected coronary artery disease.

**Abstracts**

**Plaque quantification: Hype or Hope?**

There is broad interest in the characterization of atherosclerotic coronary plaque to predict and prevent myocardial infarction. Cardiac CT is the only clinically used noninvasive imaging technique that can image the coronary plaque burden. Cardiac CT can distinguish calcified and non-calcified plaque components as well as specific features associated with plaque rupture. Quantification of coronary plaque has potential value for estimation of overall risk and monitoring of pharmacological interventions. There are however fundamental and practical limitations that need to be taken into consideration.
DAY 2 – AUGUST 20 (FRIDAY) / CHANNEL 2

8:30 - 10:00 (GMT + 7)

Educational Course 2
How to do Cardiac CT

Chairperson(s)

Prof. Nguyen Quoc Dung (VNM)
Dr. Akira Kurata (JPN)

Speaker/Lecturers

Dr. Akira Kurata (JPN)
Dr. Ki Seok Choo (KOR)
Dr. Sung Min Ko (KOR)
A/Prof. Shyh-Jye Chen (TWN)

8:30  Cardiac CT machine: update
Dr. Akira Kurata (JP)

8:50  Avoiding artifacts: image reconstruction and post-processing
Dr. Ki Seok Choo (KR)

9:10  For the evaluation valvular disease
Dr. Sung Min Ko (KR)

9:30  Cardiac CT in Pediatric heart diseases
A/Prof. Shyh-Jye Chen (TW)
Speaker

Dr. Akira Kurata

(JPN)
Chief of Cardiology
National Hospital Organization
Shikoku Cancer Center

Email akuratasan2000@gmail.com

Brief Information

Dr. Akira Kurata is the chief cardiologist of the Cardiology Department at Shikoku Cancer Center in Japan. He trained in Ehime University Hospital (EUH) and affiliated hospitals in cardiology. In the PhD course at Ehime University Graduate School of Medicine, he reported the first clinical feasibility of stress CT myocardial perfusion imaging for the assessment of myocardial ischemia using MDCT in 2005. He has been an active researcher in cardiac imaging, with a special interest in cardiac CT. He moved to the EUH radiology department (2008-2012), Erasmus university medical center (2012-2014, the Netherlands, supervisor: Dr Koen Nieman), and the EUH radiology department (2014-2021). He continues clinical management of cardiovascular medicine and imaging since 2021 April.

Dr. Kurata interests in cardiac CT are diverse from CT perfusion, CT-FFR, cardiac function, coronary artery territory mapping, and 3-D printing.
Abstract

Cardiac CT machine: update

Non-invasive assessment of cardiovascular disease has been a great challenge in diagnostic imaging since the introduction of cardiac computed tomography (CT). Technological advances in cardiac CT, together with improvements in spatial, temporal, and contrast resolution, allow implementation of the CT assessment in clinical practice.

A wider and faster CT machine has a great advantage of depicting the heart in a shorter time without temporal and spatial gap, and cardiac CT plays an important role as a first-line test in the diagnostic management of coronary artery disease (CAD). CT myocardial perfusion imaging and delayed enhanced CT imaging can assess myocardial ischemia and infarction as an alternative test to SPECT in evaluating the hemodynamic significance of CAD. Iterative reconstruction has greatly aided in improving image quality and radiation dose reduction combined with low-dose scanning in the assessment of coronary arteries, the function of the myocardium. In addition, artificial intelligence has been introduced in the field of image reconstruction. This is a promising technology that will also bring great benefits to hardware updates for the diagnostic imaging of cardiac CT.

Dual-energy CT and spectral CT are currently available in the diagnosis of myocardial perfusion and tissue characterization. The upcoming major hardware advances in cardiac CT include ultra-high-resolution CT, photon-counting CT, and phase-contrast CT. Several clinical and experimental studies show the feasibility of improving calcified (or) stented vessel visualization, image noise and contrast resolution reduction.

This presentation will share an overview of the current status and future perspective in cardiac CT.
Speaker
Dr. Ki Seok Choo
(KOR)
Pusan National University Yangsan Hospital
Email kschoo0618@naver.com

Education
Basic medical degree: Pusan National University , Busan, Korea
PhD degree: Pusan National University , Busan, Korea

Post-Graduate Education*
Internship: Pusan National University Hospital, Busan, Korea
Residency: Pusan National University Hospital, Busan, Korea
Fellowship: Samsung Medical Center, Seoul, Korea
Visiting doctor in stanford university hospital: 2016.12-2107.1
Board Member: Korean Society of Radiology, Korean Society of Cardiovascular imaging, Korean Society of Breast imaging, Asian Society of Cardiovascular imaging
At present, Professor , department of radiology, Pusan National University Yangsan Hospital

Academic Appointments*
Board Member: Korean Society of Radiology, Korean Society of Cardiovascular imaging, Korean Society of Breast imaging, Asian Society of Cardiovascular imaging
Professional Affiliations and

Scientific Publications*
Recent published Paper (2017-2020)
1. Comparison of noise-optimized linearly blended images and noise-optimized virtual monoenergetic images evaluated by dual-source, dual-energy CT in cardiac vein assessment.
2. Simultaneous Assessment of Left Ventricular Function and Coronary Artery Anatomy by Third-generation Dual-source Computed Tomography Using a Low Radiation Dose.

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4. Volumetric change of the latissimus dorsi muscle after immediate breast reconstruction with an extended latissimus dorsi musculocutaneous flap.
Nam SB, Oh HC, Choi JY, Bae SH, Choo KS, Kim HY, Lee SH, Lee JW.
Arch Plast Surg. 2019 Mar;46(2):135-139 (co-author)

5. Association between carotid artery stenosis and peripheral artery disease: Evaluation by screening carotid ultrasonography (cross-sectional study).
Jung HJ, Lee SS, Kim HY, Park BS, Kim DI, Nam KJ, Roh JE, Choo KS.
Medicine (Baltimore). 2019 Feb;98(6):e14163 (corresponding author)

Hong SH, Goo HW, Maeda E, Choo KS, Tsai IC; Asian Society of Cardiovascular Imaging Congenital Heart Disease Study Group.

Lee SM, Nam KJ, Choo KS, Kim JY, Jeong DW, Kim HY, Kim JY. (co-author)

8. Diffusion tensor magnetic resonance imaging of breast cancer: associations between diffusion metrics and histological prognostic factors.

Kim JY, Kang HJ, Shin JK, Lee NK, Song YS, Nam KJ, Choo KS.

10. Image quality and radiation dose of CT venography with double dose reduction using model based iterative reconstruction: comparison with conventional CT venography using filtered back projection.
Jeong YJ, Choo KS, Nam KJ, Lee JW, Kim JY, Jung HJ, Lim SJ. (corresponding author)
11. Image quality of CT angiography in young children with congenital heart disease: a comparison between the sinogram-affirmed iterative reconstruction (SAFIRE) and advanced modelled iterative reconstruction (ADMIRE) algorithms.
   Nam SB, Jeong DW, Choo KS, Nam KJ, Hwang JY, Lee JW, Kim JY, Lim SJ. (corresponding author)


12. Predictive Value of Cardiac Magnetic Resonance Imaging-Derived Myocardial Strain for Poor Outcomes in Patients with Acute Myocarditis
   Lee JW, Jeong YJ, Lee GW, Lee NK, Lee HW, Kim JY, Choi BS, Choo KS (corresponding author)

   Atabaev TS, Lee JH, Shin YC, Han DW, Choo KS, Jeon UB, Hwang JY, Yeom JA, Kim HK, Hwang YH.

*Nanomaterials (Basel). 2017 Feb 10;7(2). (co-author)*

   *JACC Cardiovasc Interv. 2017 Mar 27;10(6):597-610*

15. Subjective and objective image differences in pediatric computed tomography cardiac angiography using lower iodine concentration.
   Hwang JY, Choo KS, Choi YY, Kim JH, Ryu H, Han J, Kim YW, Jeon UB, Nam KJ. (corresponding author)
Abstract

Avoiding artifacts: image reconstruction and post-processing

With technical developments, cardiac computed tomography (CT) has been widely adopted for non-invasive evaluation of various heart diseases. However, cardiac CT is susceptible to a variety of artifacts, including patient- and procedural-specific artifacts, some of which are unique to cardiac imaging. Patient related artifact can occurred from obesity, Breath-hold, movement, dense calcium or metal and procedural-specific artifacts include 1) ECG related: high or variable HR, selection of incorrect phase 2) contrast related: poor contrast enhancement, streak artifact 3) Incomplete coverage In case of obese patient, adequate kVp, mA and contrast administration must be applied to reduce artifact. Respiratory motion is well recognized at lung window setting and breath hold exercise before scan start is necessary to overcome respiratory motion artifact. Beam hardening artifact is caused by polychromatic nature of X-ray beam and modified contrast protocol is useful to decrease iodine density (etc: RA,SVC). If pitch is too high for heart rate (HR), get gaps in data, which is called as banding artifact therefore pitch must be set according to HR: higher HR, faster table speed and Lower HR, slower table speed, Stair –step artifact can be occurred from non-optimal phase selection and ECG-editing, B-blocker and wide detector can be solution in this artifact
**Speaker**

**Dr. Sung Min Ko**  
(KOR)

Head Professor and Director of Department of Radiology Yonsei University Wonju College of Medicine, Wonju Severance Christian Hospital

**Specialty**

Cardiovascular imaging

**Education (50 words)**

Yonsei University Wonju College of Medicine in 1994

**Post-Graduate Education (50 words)**

PhD degree at Chungnam National University Graduate School in 2010

**Academic Appointments (100 words)**

- Deputy editor of Journal of Cardiovascular Imaging
- General secretary of CIVICS (Cardiac CT summit)
- Committee member of international liaison of ASCI
- Professional Affiliations and

**Scientific Publications (100 words)**

- KOSCI, ESCR, SCCT, NASCI, ASCI, and SCMR members
- 50 scientific SCI(E) publications as first author or corresponding author.

**Recent paper:**

Abstract

For the evaluation valvular disease

Valvular heart disease (VHD) is increasing in prevalence and causes significant morbidity and mortality. VHD is due primarily to age-related degenerative and congenital causes, whereas in the developing world, rheumatic fever is the primary cause of VHD. Image acquisition in cardiac CT for the evaluation of cardiac valves is based on a protocol developed for coronary CT angiography. Aortic and mitral valves are visualized with a conventional coronary CT angiography triphasic injection protocol. Retrospective ECG-gated multi-detector CT (MDCT) is recommended for obtaining both static and cine images. For cardiac valve evaluation, image data sets are reconstructed at 5 % or 10 % increments of the cardiac cycle with a 1-mm slice thickness. Postprocessing of CT data sets includes both static and cine images in various cardiac orientations. Static images are created using multiplanar reconstruction or volume-rendering techniques. Standard echocardiographic views, which include the 2-chamber short axis, 2-chamber long axis, and 4-chamber long axis views, are also reconstructed. Cine images of 10 or 20 cardiac phases allow for qualitative assessment of valve motion and function. Cardiac CT can provide accurate anatomical images of valves and valve motion as well as precise quantitation of valve calcification. Usually, by reviewing dynamic cine images, phases of maximal opening and closing of the diseased valves can be determined and then cross-sectional planimetric images reconstructed to measure the smallest stenotic valve area (commonly at the tips of the leaflets) and regurgitant orifice area (ROA) using a cardiac dedicated workstation. Optimal image quality for aortic valve planimetry is best achieved during mid-systole (approximately 20 % of the R–R interval). The planimetered ROA of the aortic valve is usually calculated during mid-diastole (approximately 60–70 % of the R–R interval). In the case of the mitral valve, the anatomical valve area is usually measured using CT data from 60 to 70 % of the R–R interval. For planimetric ROA measurement, 20–30 % of the R–R interval is the best phase for multiplanar reformatted imaging of the closed mitral valve. Among the currently available dose reduction strategies, ECG-based tube current modulation and a 100-kV tube voltage are associated with a considerable reduction in radiation dose.

The use of cardiac CT is appropriate for characterizing native or prosthetic valves in patients with suspected clinical significant valvular dysfunction when images from other noninvasive methods are inadequate. Cardiac CT for preoperative coronary assessment is a potential option for those patients scheduled to undergo valve surgery when the pretest CAD risk is either intermediate (appropriate) or low (uncertain). Cardiac CT is important adjunct to echocardiography for the evaluation of aortic and mitral VHDs. Cardiac CT not only helps identify many causes of aortic and mitral VHDs, but also allows quantitative assessment of the severity of valvular dysfunction. As the use of cardiac CT grows, awareness of the imaging findings of various aortic and mitral VHDs may foster recognition of suspected left-sided VHDs.
**Speaker**

A/Prof. Shyh-Jye Chen  
(TWN)

Director/ Radiology/ National Taiwan University  
National Taiwan University Hospital

Email  james_5586@hotmail.com

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**Self-introduction**

Current Affiliation:
- Chairman, Radiologist, Department of Medical Imaging, National Taiwan University Hospital and Children Hospital
- Board Member, Taiwan Radiological Society
- Secretary General, Asia Society of Cardiovascular Imaging

Past Affiliation:
- Secretary General, Taiwan Radiological Society
- Chief, Department of Common Examination, National Taiwan University Hospital
- Vice-Chief, Department of Medical Imaging, National Taiwan University Hospital

**Education background**

College of Medicine – MD, National Taiwan University 1983 - 1990
Graduate School – PhD, National Taiwan University 2000 - 2005

**Professional**

Pediatric cardio-radiology, pediatric radiology

**Academic appointments**

1999 – 2001  Clinical Instructor of Radiology, National Taiwan University
2001 – 2007  Clinical Assistant Professor of Radiology, National Taiwan University
2007 – 2009  Clinical Associate Professor of Radiology, National Taiwan University
2009 - Present  Associate Professor of Radiology, National Taiwan University

**Publications**

(160 SCI papers with listing the latest 5 important articles)
Publications

(160 SCI papers with listing the latest 5 important articles)


Publications

(160 SCI papers with listing the most cited 5 articles)


Abstracts

Cardiac CT in Pediatric heart diseases

With the rapid advancements of the cardiac CT (computed tomography), children's hearts get more insights to markedly improve clinical treatment in both congenital and acquired diseases. These are increased spatial and temporal resolutions, increased speed of data acquisition and power of post-processing and a markedly decreased radiation burden. This results in the cardiac CT to be an essential diagnostic tool in the daily multimodality imaging practice alongside echocardiography, cardiac magnetic resonance imaging, invasive cardiac catheterization and angiography. Knowledge about the detailed CT machines and their protocols are basic to achieve an individualized scanning with specific focus on patient preparation and contrast medium administration. Using these cardiac CT images with good quality, excellent image interpretation not only depends on disease patterns but comprehensive knowledge of the underlying anatomy and pathophysiology. This presentation would like to disclose the usefulness of the cardiac CT in pediatric heart diseases.
8:30 - 10:00 (GMT + 7)

**Refresh course 1**

*Imaging Assisted Cardiac Intervention except for TAVR*

**Chairperson(s)**

Dr. Nguyen Ngoc Trang (VNM)  
Prof. Jin Hur (KOR)

**Speaker/Lecturers**

Dr. Jia Yin Zhang (CHN)  
A/Prof. Hoang Anh Tien (VNM)  
Prof. Jin Hur (KOR)  
A/Prof. Sung Ho Hwang (KOR)

**8:30**  
Preprocedural imaging of CTO lesions: from anatomy to function  
*Dr. Jia Yin Zhang (CHN)*

**8:50**  
AI in interventional cardiology  
*A/Prof. Hoang Anh Tien (VNM)*

**9:10**  
For LAA Occlusion  
*Prof. Jin Hur (KOR)*

**9:30**  
For RFA  
*A/Prof. Sung Ho Hwang (KOR)*
Speaker  
**Dr. Jia Yin Zhang**  
(CHN)  
Shanghai General Hospital, Shanghai Jiao Tong University, School of Medicine  
Email andrewssmu@msn.com

**Brief CV**

Department Chief, Attending Radiologist from Department of Radiology, Shanghai General Hospital. Subspecialized in chest and cardiovascular imaging. The main research interests include CT myocardial perfusion imaging, coronary plaque imaging and CT-FFR application. Has published 42 SCI-indexed original articles, including 5 publications in *Radiology*.

**Abstracts**

**Preprocedural imaging of CTO lesions: from anatomy to function**

Chronic total occlusion (CTO) is one of the most challenging conditions for interventional cardiologists. Precise pre-procedural evaluation is pivotal for successful revascularization. Preprocedural imaging of CTO lesions consists of anatomical and functional aspects. For CTO anatomies, coronary CT angiography is accurate for various parameters measurement, including lesion length, lesion tortuosity, ostial morphology, and calcium burden. In addition, it is also of note that reverse attenuation gradient sign is helpful for differentiation of CTO from subtotal occlusion on CCTA. In terms of functional assessment, viability imaging by CMR is used to identify the extent of salvageable myocardium. More recently, late iodine enhancement has also been validated for scar imaging, with reference to CMR. This lecture will cover the above aspects to give a comprehensive view on the preprocedural imaging of CTO lesions.
Speaker

A/Prof. Hoang Anh Tien
(VNM)

Vice director of Hue university of medicine and pharmacy Hospital

Email  bsanhtien@gmail.com

Education:
Associated Professor, Hue University of Medicine and Pharmacy, 2014
(Give the information about degrees, places of education, and years of graduation)
Experiences:
Guiding the topic of graduation of 9 graduate students and 12 students
Chaired 1 provincial project, 3 Hue university level projects, 8 Hue university of Medicine
and Pharmacy projects
10 years of experience in PCI and pacemaker.
180 cases PCI per year, 1050 cases PCI in total.
60 cases pacemaker per year, 470 cases pacemaker in total.

Position:
Vice director of Cardiovascular Centre of Hue University of Medicine and Pharmacy Hospital
Vice head of Cardiology Department of Hue University Hue University of Medicine and Pharmacy Hospital
Head of Digital Subtraction Angiography (DSA) unit of Hue University of Medicine and Pharmacy Hospital
The Fellow of the American College of Cardiology (FACC)
The Fellow of Society for Cardiovascular Angiography and Interventions (SCAI)
Vice Head of Cardiology Department, Hue University Hospital
Master of Internal Medicine, Hue University of Medicine and Pharmacy, Vietnam 2004-2006
PhD of Cardiology, Hue University of Medicine and Pharmacy, Vietnam 2007-2010
High-ranking lecturer of the Internal Medicine Department, Hue University of Medicine and Pharmacy.
Member of European Society of Cardiology (ESC),
Member of Heart Rhythm Society (HRS)
Commissioner of connecting Vietnamese young talent
Member of the Standing Committee of Vietnamese Internal Medicine
Member of the executive board of the Vietnamese Cardiovascular Association
Member of the executive board of the Vietnamese Cardiovascular Intervention Association
Member of the executive board of the Vietnamese Heart Rhythm Association
Commissioner of Editor Board of Vietnam journal of Medicine and Pharmacy

Skills:
Give the information about research areas of interest, teaching subjects, computer and language skills
Research: Qualitative and quantitative research, action research
Teaching: Cardiovascular disease, ECG, Echocardiography, Cardiac Interventional, Pacemaker
Computer: MS Word, MS Excel, SPSS, and Power Point
Language: English and French

International Publications:


Abstracts

AI in interventional cardiology

Introduction

- Artificial intelligence (AI) applications like clinical decision support systems (CDSS) can prompt the application of evidence-based cardiology in clinical practice.

- Is a computer system that deals with big clinical data and ESC medical knowledge/guidelines and is intended to provide decision support?

- AI and super brain training by ESC guidelines and AUC integrated with specific cases boost the correct decision support in the clinical path flow context.

Content

- The field of AI has initiated a paradigm shift in health care with advanced analytical techniques.

- Potential applications of AI in interventional cardiology (IC) are image and video analysis, clinical decision support, robotic assistance with procedure, and novel approaches to clinical database analysis.

- The current development of AI in IC is in its early stage, but it has the potential to transform IC practice.

- The AI CDSS approach has the potential to save costs and staff time in the triage of patients with stable chest pain.

- The AI CDSS approach has the potential to save costs and staff time in the triage of patients with stable chest pain.

- Even with some limitations (No of pts, cost model approach, no outcome provided), these results might have important implications for policy and clinical practice.

Conclusion

- AI encompasses a broad application of mathematical algorithms to train machines to mimic human behavior. There is increasing interest in developing AI technology for application in healthcare.
• AI operations include machine learning (ML), deep learning (DL), natural language processing (NLP), cognitive computing, computer vision, and robotics.

• Virtual applications of AI have the potential to enhance image reconstruction, analysis, and interpretation. This is currently being used for coronary anatomic and functional lesion analysis.

• Clinical decision support systems apply ML, NLP, and pattern recognition to assist with imitating human thought processing. IBM is currently developing Medical Sieve, an automated cognitive assistant for cardiologists and radiologists to aid clinical decision-making.

• Virtual reality platforms are currently being used for the periprocedural planning of structural heart interventions.

• Robotics are in their initial phase of application in interventional cardiology and not likely to replace a human interventional cardiologist in the near future. Although they can provide physical assistance, they do not perform intelligence assistance at this time.

• AI is poised to transform and enhance the practice of interventional cardiology. Whether we can use it intelligently to enhance patient care and outcomes remains to be determined.
Speaker

Prof. Jin Hur
(KOR)

Department of Radiology, Severance Hospital,
Yonsei University College of Medicine, South Korea

Email  khuhz@yuhs.ac

Education and Training

1995 – 2001:  Yonsei University College of Medicine, Seoul
2001.3 :   Doctor of medicine (M.D.), Korea
2003 – 2005:  Master’s course and a degree, The graduate school, Yonsei
University, Seoul
   “Assessment of Right Ventricular Function and Lung Volumes using
Multi-detector
Row Computed Tomography in Chronic Obstructive Pulmonary
Disease Patients”
2007 – 2010:  Doctor’s course and the degree of Doctor of Philosophy
The graduate school, Yonsei University, Seoul
   “Assessment of atherosclerotic plaques in a rabbit model by multi
phase contrast-enhanced CT angiography: comparison with
histopathology”

Career

2001 – 2002:  Rotational Internship
Severance Hospital, Yonsei University Medical Center, Seoul
2002 – 2006:  Postgraduate training2
Department of Radiology, Severance Hospital, Yonsei University, Seoul
2006 – 2008:  Fellowship (Cardiac and chest)
Department of Radiology, Severance Hospital, Yonsei University, Seoul
2009.2 – 2015.2 :  Assistant Professor of Radiology, Yonsei University College of Medicine
2015.3~ 2020.2:  Associate Professor of Radiology, Yonsei University College of Medicine
2020.3~ :  Professor of Radiology, Yonsei University College of Medicine

Certification

Licensure:  National Medical License, Korea, March 2001
Certification:  Korean Board of Radiology, February 2006

Society memberships
Asian Society of Cardiovascular Imaging

The 14th Congress of Asian Society of Cardiovascular Imaging (ASCI 2021)

2002: Korean Society of Radiology
2007: Korean Society of Cardiovascular Imaging
2007: Korean Society of Thoracic Imaging
2007: Asian Society of Cardiovascular Imaging
2009: Korean Society of Cardiology
2009: Radiological Society of North America
2011: Society of Cardiovascular Computed Tomography

Awards & Honors

2007: Best Researcher Award for Fellowship, Gangnam Severance hospital
2007: Introduction to research for international young academics (IRIYA), Nominee
2007: Radiological Society of North America (RSNA)
2008: Best Oral Presentation Award, Silver Medal, 2008 Korean Congress of Radiology (KCR)
: Two-Phase Cardiac Computed Tomographic Angiography for Detection of Thrombus in the Left Atrial Appendage in Stroke Patients: Comparison with Transesophageal Echocardiography
2009: Best SCI Journal Award, 2009 Korean Congress of Radiology (KCR)
: Thrombus in the left atrial appendage in stroke patients: Detection with cardiac CT angiography Radiology 2008;249:81-87
2010: Excellent Young Researcher Award, Yonsei University of College of Medicine
2010: MRA Poster Award, Gold Medal, The 22 annual international conference on MRA club
: Use of contrast enhancement and high-resolution 3D black-blood MR imaging to identify inflammation in rabbit atherosclerotic plaque
2010: Poster Award, Gold Medal, The 4 th Congress of Asian Society of Cardiovascular imaging
: Contrast-enhancement reflecting inflammation in atherosclerotic plaques: high-resolution 3D black-blood MR Imaging
Imaging assisted cardiac intervention for LAA occlusion

Atrial fibrillation (AF) significantly increases the risk of ischemic stroke, with varying degree depending on the individual patient's stroke risk factors. The left atrial appendage (LAA) is the main source of stroke-causing thrombus and is more often fatal and disabling in patients with AF. Warfarin and novel oral anticoagulants (NOACs) are used to prevent stroke and peripheral embolization in patient with nonvalvular AF. However, a significant percentage of patients could not be started on anticoagulation because of bleeding issues.

Transcatheter LAA closure is a rapidly growing option for prevention of stroke in patients with nonvalvular atrial fibrillation. LAA closure devices can be implanted by means of either an endocardial or a combined endocardial and epicardial approach. Preprocedural imaging is key to identifying contraindications, accurately sizing the device, and minimizing complications. Real-time visualization of the LAA for device positioning and deployment is a key for successful implantation. Currently, transesophageal echocardiography (TEE) has been used as the reference standard imaging modality for assessing the anatomy for LAA closure and for providing intraprocedural guidance.

CT has emerged as a less-invasive alternative to TEE for pre- and postprocedural imaging. CT is useful for excluding intracardiac thrombus. CT can also be used for the evaluation of LAA anatomy, device sizing and for the evaluation of pulmonary venous and extracardiac structures. CT can also provide more convenient method for the evaluation of postprocedural complications such as incomplete closure, peridevice leaking, device-related thrombus, and device dislodgement.

The role of CT in LAA closure is important to patient device selection, patient device delivery system selection, and long-term patient device follow-up. However, CT imaging has fundamental disadvantages, including radiation dose and use of iodinated contrast media. Continued technologic advances requiring less contrast material and ionizing radiation could increase the import role of cardiac CT in this field in the near future.
Speaker

Prof. Sung Ho Hwang
(KOR)
Department of Radiology, Korea University Anam Hospital
Email sungho77@korea.ac.kr

Education
Philosophiae Doctor (Ph.D.) in Medicine: Feb 2016, Korea University, Republic of Korea
Master of Science (M.S.) in Medicine: Feb 2007, Yonsei University, Republic of Korea
Bachelor of Science (B.S.) in Medicine: Feb 2003, Yonsei University, Republic of Korea

Award
2018. Winner of Asian Society of Cardiovascular Imaging Best Young Present Award

Publications
Abstracts

Radiofrequency Ablation (RFA): Electrophysiologic Intervention

Radiofrequency ablation (RFA) is a catheter-based intervention for management of arrhythmia, especially atrial fibrillation (AF).

1. Cardiac arrhythmia: AF
   - Worldwide, AF is the most common sustained cardiac arrhythmia in adults.
   - It is a supraventricular tachycardia with uncoordinated atrial electrical activation and consequently ineffective atrial contraction.
   - Symptoms related to AF may range from none to disabling, and rhythm control treatment may improve quality of life in patients with AF.

2. Catheter ablation of AF
   - Catheter ablation is a well-established treatment in maintaining sinus rhythm and reducing symptoms related to AF.
   - The cornerstone of catheter ablation is the complete isolation of pulmonary veins using point-by-point radiofrequency ablation.
   - Commonly, cardiac CT or MRI can be used in the preprocedural evaluation and in the follow-up after the catheter ablation of AF.

3. Roles of cardiac imaging for catheter ablation
   - Before catheter ablation
     i. evaluation of AF burden/cardiac thrombus
     ii. guidance for catheter approaching

   - After catheter ablation
     i. usual changes of cardiac structures after the catheter ablation
     ii. complications of catheter ablation

4. Summary
   - With advances of catheter-based RFA, the rhythm control treatment has become more active and aggressive in patients with AF.
   - The catheter ablation of AF needs detailed delineation and evaluation of cardiac structures beyond the electrophysiologic study.
   - Therefore, recently the roles of cardiac imaging such as CT and MRI have been emphasized in the catheter ablation of AF.
DAY 2 – AUGUST 20 (FRIDAY) / CHANNEL 1

10:30 - 12:00 (GMT + 7)

**Special focus 1**

**Artificial Intelligence**

*Chairperson(s)*

- A/Prof. Vu Dang Luu (VNM)
- Prof. Sang Il Choi (KOR)

*Speaker/Lecturers*

- Prof. U Joseph Schoepf (USA)
- Prof. Micheal Salerno (USA)
- Prof. Roberto M Lang (USA)
- Dr. Hong Yoon Choi (KOR)

**10:30**  
AI application in Cardiac CT  
*Prof. U Joseph Schoepf (USA)*

**10:50**  
AI application in Cardiac MR  
*Prof. Micheal Salerno (USA)*

**11:10**  
AI application in Echocardiography  
*Prof. Roberto M Lang (USA)*

**11:30**  
AI application in Nuclear Cardiology and Hybrid Imaging  
*Dr. Hong Yoon Choi (KOR)*
Joe Schoepf is a Professor with appointments in Radiology, Cardiovascular Medicine, and Pediatrics at the Medical University of South Carolina (MUSC) in Charleston, SC. At MUSC Dr. Schoepf serves as the director of the Division of Cardiovascular Imaging and as Vice Chair for Research.

Dr. Schoepf, a native of Austria, graduated from the medical school of Ludwig Maximilians University in Munich, Germany, in 1996. After his residency in Diagnostic Radiology at Klinikum Grosshadern, Munich, Germany, he assumed a position at Brigham and Women’s Hospital, Harvard Medical School, in Boston, MA, which he held from 2001-2004. Dr. Schoepf holds a current unrestricted medical license in the State of South Carolina and is certified in Diagnostic Radiology by the American and Austrian Specialty Boards as well as in cardiac CT by the American College of Radiology and the Certification Board of Cardiovascular Computed Tomography. His main clinical and scientific interest is non-invasive cardiovascular and thoracic imaging, especially the use of advanced CT and MRI techniques for diagnosing disorders of the heart and lung.

Dr. Schoepf is the Editor-in-Chief of the Journal of Thoracic Imaging and has been serving on the editorial boards of several other scientific journals including Radiology, the Journal of the American Heart Association, European Radiology, the American Journal of Roentgenology, Academic Radiology, and the Chinese Journal of Academic Radiology. He has given >400 invited lectures internationally, has authored >500 articles in peer reviewed scientific journals, >20 book chapters, and five books.

Dr. Schoepf is Past President of the North American Society for Cardiovascular Imaging and is a member of numerous other scientific societies. He has been serving as chairman of several committees of the American College of Radiology, the Radiological Society of North America, American Heart Association, Society of Computed Body Tomography and MR, and the Society of Thoracic Radiology. He is an honorary member of the Hungarian Radiology Society and of the Société Canadienne-Française de Radiologie and received Honorary Professorship from Nanjing University, China. Dr. Schoepf was elected Fellow of...
the American College of Radiology, American Heart Association, North American Society of Cardiovascular Imaging, Society of Computed Body Tomography and MR, and of the Society for Cardiovascular CT.

Dr. Schoepf has been named among the top 10 cardiovascular imagers worldwide by Medical Imaging Magazine two years in a row. He has been continuously listed among the Best Doctors in America® since 2007 and was ranked as Most Influential in Radiology by RT Image Magazine in 2008. In 2013 he was selected as the “Most Influential Radiology Researcher” by AuntMinnie.com.

**Abstracts**

**AI application in Cardiac CT**

With advantages in computing power and AI algorithms, the capabilities and applications of artificial intelligence (AI) are rapidly progressing. Over the last years, research into possibilities of AI in cardiac CT has provided a growing body of evidence for different applications such as image optimization, automated segmentation of cardiac structures, assessment of coronary calcium or stenosis quantification and plaque analysis. This presentation is intended to give an overview of current AI applications in cardiac CT and to provide an outlook on current research topics and future possibilities.
Speaker

Prof. Micheal Salerno

(USA)

Abstracts

AI application in Cardiac MR
Speaker

Prof. Roberto M Lang
(USA)
University of Chicago, Chicago, Illinois USA
Email rlang@medicine.bsd.uchicago.edu

Education
Univeristy of Buenos Aires, Argentina

Post-Graduate Education
University of Wisconsin, USA
University of Chicago, USA

Academic Appointments
A.J. Carlson Professor of Medicine and Radiology
Director Cardiac Imaging
University of Chicago, Chicago, Illinois

Professional Affiliations and Scientific Publications
700 Peer Review Publications
11 books
120 Chapters

FASE
FACC
Past President of ASE
Vice President of NBE

Abstracts
AI application in Echocardiography
Speaker
Dr. Hong Yoon Choi
(KOR)
Assistant Professor, Department of Nuclear Medicine, Seoul National University Hospital
Email chy1000@snu.ac.kr

Education
2014 Ph.D. Department of Molecular Medicine and Biopharmaceutical Sciences, Graduate School of Convergence Science and Technology, Seoul National University (Supervisor: Dong Soo Lee, M.D., Ph.D.)
2010 M.D. Seoul National University College of Medicine

Working
2018.9- Assistant professor, Department of Nuclear Medicine, Seoul National University Hospital
2015-2018 Public Health Doctor, Cheon-An (Military Service)
2011-2015 Residency, Department of Nuclear Medicine, Seoul National University Hospital
2010-2011 Internship, Department of Nuclear Medicine, Seoul National University Hospital

Awards
MAR 18 2019 30 Early Career Professionals to Watch, Society of Nuclear Medicine and Molecular Imaging
NOV 2 2018 Young Investigator Award, Korean Society of Human Brain Mapping
NOV 4 2016 Asian Young Investigator Award, Japanese Society of Nuclear Medicine
OCT 29 2016 Best Paper Award, Korea Society of Nuclear Medicine
OCT 29 2016 Young Investigator Award, Korea Society of Nuclear Medicine
Aug 23 2015 20th, Seoul Medical Association Medical Research Award - Young Medical Scientist Award
Feb 2010 Alumni Award, Seoul National University
Publications (Journal Papers)
*: Corresponding author


Abstract

AI application in Nuclear Cardiology and Hybrid Imaging

As recent advances in deep learning have impacted various scientific and industrial fields, medicine has rapidly adopted this technique. The major target of the application has been medical images. Several deep learning techniques have been developed for diagnostic classification using nuclear imaging as well as X-ray, ultrasonography, and MRI. Although recent deep learning shows remarkable performance on image classification, there are many challenges that need to be addressed to contribute to medical innovation in earnest. In particular, as the purpose of nuclear cardiology imaging is quantitatively evaluating functions, the AI application needs to concentrate on quantification of functions related to prognosis and treatment strategy. The final goal of nuclear cardiology is different from the simple diagnostic classification. By defining the severity of key pathophysiology represented by complex patterns on nuclear imaging and predicting each patient’s outcome, AI helps nuclear cardiology to be a robust quantitative imaging biomarker. In this lecture, I will deal with the ultimate goal of medical application of deep learning that will not be simply to improve diagnostic accuracy, but accurately map the healthy state of a person mainly focusing on nuclear cardiology.
DAY 2 – AUGUST 20 (FRIDAY) / CHANNEL 2

10:30 - 12:00 (GMT + 7)

Update lecture 2
Hot topics in CMR

Chairperson(s)

Dr. Nguyen Khoi Viet (VNM)
Dr. Teruhito Mochizuki (JPN)

Speaker/Lecturers

Dr. Byoung Wook Choi (KOR)  Prof. Lotz Joachim (DEU)  Prof. Steffen Petersen (GBR)  Prof. Tim Leiner (NLD)

10:30   Parametric mapping: techniques and issues
Dr. Byoung Wook Choi (KOR)

10:50   CMR in Arrhythmia and Sudden Cardiac Death
Prof. Lotz Joachim (DEU)

11:10   COVID and the Hearts
Prof. Steffen Petersen (GBR)

11:30   Non-contrast CMR applications
Prof. Tim Leiner (NLD)
Speaker

Dr. Byoung Wook Choi

(KOR)

Professor, Director, Department of Cardiovascular Radiology, Severance Cardiovascular Hospital, Yonsei University College of Medicine, Seoul, South Korea
Director, Research Institute of Radiological Science, Yonsei University College of Medicine
Director, Center for Clinical Imaging Data Science, Yonsei University College of Medicine
Director, Bureau of Health Technology R&D Planning and Budget, Korea Health Industry Development Institute

Email bchoi@yuhs.ac

Education:
1983-1988 Yonsei University College of Medicine, Seoul, South Korea
1995-1996 Master’s degree, Yonsei University College of Medicine, Seoul, South Korea
1997-2001 PhD Diagnostic Radiology, Yonsei University College of Medicine, Seoul, South Korea
2005-2006 Research Fellow, Cardiovascular division, Beth Israel Deaconess Medical Center, Harvard Medical College, Boston, USA

Employment
1995-1998 Resident, Department of Diagnostic Radiology, Severance Hospital, Seoul, South Korea
1999-2001 Fellowship, Division of Cardiothoracic Radiology, Yonsei University College of Medicine, Seoul, South Korea
2002-2006 Assistant Professor, Department of Radiology, Yonsei University, Seoul, South Korea
2005-2006 Research Fellow, CMR Laboratory, Cardiology Division, Beth Israel Deaconess Hospital, Boston, USA
2006-2010 Associate Professor, Department of Radiology, Yonsei University, Seoul, South Korea
2010~ Chair, Department of Cardiovascular Radiology, Cardiovascular Hospital, Yonsei University Health System
2011~ Professor, Department of Radiology, Yonsei University, Seoul, South Korea
2014~ Director, Research Institute of Radiological Science, Yonsei University College of Medicine, Seoul, South Korea
2015.8 ~ 12 Visiting Professor, Integrative biomedical imaging informatics (IBIIS), Department of Radiology, Stanford University (2015.8.1~12.31)
2017.7 ~ Director, Center for Clinical Imaging Data Science, Research Institute of Radiological Science, Yonsei University College of Medicine
2020.9 ~ Director, Bureau of Health Technology R&D Planning and Budget, Korea Health Industry Development Institute

**Professional Societies**

2004- Society of Cardiovascular Magnetic Resonance (SCMR), scientific committee for SCMR 2014 in New Orleans & SCMR 2015 in Nice in France
2007- Society of Cardiovascular Computed Tomography (SCCT) – Chair, Korea international regional committee (2012-2016)
2009- Radiologic Society of North America (RSNA), member
2003- Korean Society of Circulation, member
2008- Korean Society of Lipidology and Atherosclerosis, member
2012- Korean Study Group of Cardiovascular Magnetic Resonance, Chair (2012-2015)
2009- American Heart Association (AHA), member
2018- Korean Society of Artificial Intelligence in Medicine, President (2021-22)

**Publication**

Peer reviewed SCI/SCIE publication 213
Abstract

Parametric mapping: techniques and issues
Speaker

Prof. Lotz Joachim
(NLD)

Professor of Radiology, Director, Department of Diagnostic and Interventional Radiology, University Medical Center Göttingen

Email:

Professional career

Since 2010  Professor of Radiology, Director, Department of Diagnostic and Interventional Radiology, University Medical Center Göttingen

2008, Dez Visiting Professor of Radiology, Duke University Hospital, Dep. of Radiology,

2005 - 2010  Lecturer, Assistant/Associate Professor, MHH, Hannover, Germany

2007 - 2010  Second Vice Chair of the Department of Radiology, MHH, Hannover, Germany

2002 - 2010  Staff Radiologist, Dep. of Radiology, MHH, Hannover, Germany

1995 - 2002  Residency in Radiology and Neuroradiology, MHH, Hannover, Germany

1994 - 1995  Internship in Dep. Abdominal and Transplant Surgery, MHH, Hannover, Germany

Fellowships, awards, and honours

Since 2016  Ambassador of the German Roentgen Society for China Since 2016 Mentor of the Studienstiftung des Deutschen Volkes 2013 Felix Wachsmann-Preis German Roentgen Society

1999  Certificate of Merrit RSNA

1998  The John M. Kinney Award 1998, Nestle

1991-1995  Studienstiftung des Deutschen Volkes

Professional activities

2016- 2018  Speaker of the AG Herz und GefäBe, Deutsche Roentgengesellschaft

Since 2012  Speaker for Imaging in German Center of Cardiovascular Research (DZHK)

Since 2014  Mentor for Studienstiftung des Deutschen Volkes
Research interests

Quantitative and functional Imaging. Cardiovascular and abdominal Imaging.
Publications >120 Original Publications
>420 Scientific / educational talks

Abstract

CMR in Arrhythmia and Sudden Cardiac Death
Speaker

Prof. Steffen Petersen

(GBR)

Biography

Steffen Petersen is a Professor of Cardiovascular Medicine at William Harvey Research Institute, Queen Mary University of London and a Consultant Cardiologist at Barts Heart Centre, Barts Health NHS Trust. He is also the Cardiovascular Programme Director of UCLPartners Academic Medical Centre. He is President-Elect of the European Society of Cardiology's (ESC) European Association of Cardiovascular Imaging (EACVI). He is the academic Training Programme Director for medical specialities in London. He holds an MBCHB and MDRES equivalent (Dr med.) from Johannes Gutenberg University Mainz, Germany, a DPHIL (OXON) from the Department of Cardiovascular Medicine, University of Oxford, an MPH from Harvard School of Public Health and an MSc from the London School of Economics. He is level 3 certified for cardiovascular magnetic resonance (CMR). He has been actively involved in cardiovascular magnetic resonance since 1998 and he reports over 1000 cardiac adult MRI scans each year. His research interests include clinical trials using cardiovascular magnetic resonance (CMR), cost-effectiveness analysis related to cardiac imaging and primary prevention, large scale population-based studies using CMR including AI approaches (UK Biobank cardiac imaging lead) and electronic health record research that incorporates cardiac imaging data.

Abstract

COVID and the Hearts

In this presentation I will go through the proposed mechanisms by which SARS-COV-2 affects the heart. I will then briefly provide the evidence of the higher risk of patients with cardiovascular disease and risk factors to suffer from severe COVID-19. Then, I will cover the topic of links between COVID and acute and longer term CV effects. A topic hotly debated is COVID in athletes. Only recently have we heard about myocarditis cases following mRNA vaccinations. Following my conclusions, I will provide a glimpse into what is around the corner.
Speaker
Prof. Tim Leiner
(NLD)

Current research
Project leader
Comprehensive, High definition Accelerated Non-invasive Cardiac MRI for Early diagnosis of patients with symptomatic heart disease. (CHANCE)

Completed research projects
Project leader
Towards understanding the interplay of inflammation, immunity and circulating cells in atherosclerosis development in young adulthood: a magnetic resonance study

Project leader
Detection of vulnerable plaque with coronary vessel wall magnetic resonance imaging

Classification
D23222 Cardiovascular disorders
D23330 Radiology, radiotherapy

Abstract
Non-contrast CMR applications
DAY 2 – AUGUST 20 (FRIDAY) / CHANNEL 1

14:00 - 15:30 (GMT + 7)

**ASCI meets EACVI**

*Multimodality in the evaluation and treatment of valvular heart diseases*

**Chairperson(s)**

- Dr. Nguyen Thi Thu Hoai (VNM)
- Prof. Bernhard Gerber (BEL)

**Speaker/Lecturers**

- Dr. Nguyen Thi Thu Hoai (VNM)
- Prof. Marc Dweck (GBR)
- Prof. Bernhard Gerber (BEL)
- Dr. Sang-Geon Cho (KOR)

14:00   Echocardiography  
         *Dr. Nguyen T. Thu Hoai (VNN)*

14:20   CT  
        *Prof. Marc Dweck (GBR)*

14:40   MRI  
        *Prof. Bernhard Gerber (BEL)*

15:00   Nuclear Imaging  
        *Dr. Sang-Geon Cho (KOR)*
Abstract

Echocardiography
Speaker

Prof. Marc Dweck

(GBR)

Chair of Clinical Cardiology, University of Edinburgh 2020

Current posts

• British Heart Foundation Intermediate Clinical Research Fellow
• Consultant Cardiologist, University of Edinburgh (clinically active)
• British Heart Foundation. Project Grants Committee 2018-2021
• European Society of Cardiology Congress Program Committee 2019 and 2020
• Elected Member of the Board for the European Association Cardiovascular Imaging (EACVI)
• Chair EACVI Scientific Initiatives Committee
• EACVI Scientific Documents Committee
• EACVI Task Force Member on Multi-modality Imaging
• Editorial Board Circulation
• Editorial Board Circulation Cardiovascular Imaging
• Editorial Board Heart
• Editorial Board Journal of Nuclear Cardiology

Awards & Fellowships

• 2021 William W. Parmley Young Author Award, Journal American College of Cardiology (mentor)
• 2017 British Medical Journal Imaging Team of the Year
• 2016 Michael Davies Early Career Award, British Cardiovascular Society
• 2015 Sir Jules Thorn Award for Biomedical Research
• 2015 Queen’s Anniversary Prize for Higher and Further Education
• 2015 Winner British Heart Foundation Outstanding Investigator Award
• 2015 Winner, Young Investigator Award, American College Cardiology Scientific Sessions (senior author)
• 2015 University of Edinburgh “Rising Star” Chancellor’s Award
• 2014 Glaxo-Smith Kline Emerging Scientist of the Year, Academy of Pharmaceutical Sciences
• 2014 BMJ Awards.UK Research Paper of the Year, Runner up (senior author)
2013 Finalist The Lancet Prize, Young Investigator Award Academy of Medical Sciences
2012 William W. Parmley Young Author Award, Journal American College of Cardiology
2012 Winner, Young Investigator Award, American College Cardiology Scientific Sessions
2012 President’ Medal, Royal Society of Medicine
2011 Young Research Workers Prize, Radiology Society North America, Chicago, USA

Selected Research Grants

- British Heart Foundation BHF Special Project no. SP/20/3/35123: Joint funded with DZHK and DHF, Euro 1,107,255. 4 years. Quantitative-imaging in cardiac transthyretin amyloidosis (I-CARE). Primary Applicant
- BHF Research Excellence Award to the University of Edinburgh. £3,000,000. 2019 for 5 years. Primary Investigator for Theme 2 of the applications “Fibrosis and Calcification in Cardiovascular Disease”. Co-applicant
- BHF Infrastructure Grant IG/18/1/33458. March 2018 £700,000. “Funds to upgrade and expand a radiochemistry facility to deliver current and future cardiovascular PET research” Co Applicant
- BHF Clinical Research Training Fellowship FS/17/79/33226. October 2017. £120,628. 2 years
  Mhairi Doris. Combined PET and MR imaging of coronary atherothrombosis 1 year. Primary applicant
- BHF Programme Grant RG/16/10/32375. 2016. £1,796,358. 5 years.
  “Non-invasive Imaging of Human Coronary Atherosclerosis.” Co-Applicant.
- Sir Jules Thorn Award for Biomedical Research 2016. 15/JTA. £1,364,215. 5 years.
  Primary applicant
  Myocardial fibrosis and left ventricular decompensation in patients with aortic stenosis.
- BHF Intermediate Clinical Research Fellowship. FS/14/78/31020. £976,514. 2014 for 5 years. Primary Applicant
  Modification of calcification activity and 18F-Fluoride positron emission tomography uptake in cardiovascular disease.
- BHF Clinical Training Fellowship (FS/13/77/30488). Tim Cartlidge £294,956. 2013 for 3 years. Primary Applicant.
  18F-fluoride in the identification of bioprosthetic valve degeneration following surgical and transcatheter implantation.
• Chief Scientist Office Project Grant ETM/365 £205,747. 2014 for 3 years. Co-applicant
18F-Sodium Fluoride Imaging of Abdominal Aortic Aneurysms.
• Astrazeneca. ISSBRIL0250. £300,000. Dual antiplatelet therapy to Inhibit coronary
Atherosclerosis and Myocardial injury in patients with Necrotic high-risk coronary
plaque Disease: the DIAMOND study. Co-applicant
• British Heart Foundation Project Grant. PG/13/32/30205. £299,405. 2013 for 3 yrs. Co-applicant
Development of a clinical translational model of arterial injury and repair to
assess vascular stem cell therapies.
• Chief Scientist Office Project Grant ETM/266. £211,771. 2012 for 3 years. Co-applicant
Identification of cellular inflammation in the myocardium using magnetic reso-
nance imaging.
• British Heart Foundation Project Grant PG/12/8/29371. £251,525. 2012 for 3 years. Co-applicant
Role of 18F-Sodium Fluoride imaging as a novel marker of plaque instability.
• British Heart Foundation Supplement to Clinical PhD Training Fellowship. £119,200.
2012 for 2 years.
The Role of Fibrosis in Aortic Stenosis. Primary applicant
• Chief Scientist Office Project Grant ETM/160 £225,001. 2011 for 3 years. Co-applicant
Novel imaging approaches to identify unstable atherosclerotic coronary plaques.
• British Heart Foundation Clinical PhD Training Fellowship FS/10/026. £280,048.
2010 for 3yrs. Primary applicant
Role of inflammation and calcification in the progression of aortic stenosis: the ring of fire.

Selected Publications (Pubmed 281 publications, h-index 53)
• Pawade TA, Doris MK, Bing R, White AC, Forsyth L, Evans E, Graham C, Williams
MC, Syed M, Fijusawa T, Lucatelli C, Fraser W, Ralston SH, Boon NM, Prendergast B,
Newby DE, Dweck MR. Effect of denosumab or alendronic acid on the progression
press.
• Williams MC, Kwiecinski J, Doris M, McElhinney P, Shah ASV, Mills NL, Shaw LJ, Nicol
ED, Berman DS, Slomka PJ, Newby DE, Dey D, Dweck MR. Low-Attenuation Noncal-
cified Plaque on Coronary Computed Tomography Angiography Predicts Myocardial
Infarction: Results From the Multicenter SCOT-HEART Trial (Scottish Computed To-
• Everett RJ, Treibel TA, Fukui M, Lee H, Rigolli M, Singh A, Bijsterveld P, Tastet L,
Al Musa T, Dobson L, Chin C, Captur G, Wiesemann S, Ferreira VM, Piechnik SK,
Schulz-Menger J, Schelbert EB, Clavel MA, Newby DE, Myerson SG, Pibarot P, Lee S,


**Abstract**

**Role of CT in the evaluation of heart valve disease**

We will discuss how CT can be used to assess patients with aortic stenosis, both in terms of calcium scoring to assess disease severity and the planning of TAVI procedures. We will also discuss the emerging role in patients with endocarditis, and the planning of mitral valve disease procedures.
Speaker

Prof. Bernhard Gerber

(BEL)

Professeur Ordinaire Clinique, Faculté de Médecine, UCLouvain, Brussels Belgium
Chef de Clinique, Service de Cardiologie, Cliniques Universitaires St. Luc, UCLouvain, Brussels, Belgium
Chef de Pole, Unit CARD, Institut de recherche expérimentale et Clinique (IREC)
2020-2021 Vice President and Chair of cMR Section
EACVI (European Association for Cardiovascular Imaging.
President Elect, Belgian Society of Cardiology (BSC) (starting 2022).

Abstract

MRI
Speaker

Dr. Sang-Geon Cho
(KOR)
Nuclear Medicine, Chonnam National University Hospital, Gwangju, Republic of Korea

Career
2008 MD (College of Medicine, Chosun University, Gwangju, Korea)
2013 Visiting research fellow, Klinikum rechts der Isar, TUM, Munich, Germany
2018 PhD (Chonnam National University Graduate School, Gwang-ju, Korea)
2020 Fellow of Asian Nuclear Medicine Board (FANMB)
2020- Clinical Assistant Professor (Chonnam National University Hospital, Gwangju, Korea)

Awards
2020 Best Clinical Research Paper Award (Korean Society of Echocardiography)
2019 Best Oral Presentation Award (KSNM Annual Scientific Meeting 2019)
2018 Best Clinical Research Paper Award (Korean Society of Nuclear Medicine)
2017 Best Reviewer Award (Nuclear Medicine and Molecular Imaging, official journal of the Korean Society of Nuclear Medicine)
2015 Young Investigator’s Award (KSNM-AOCNMB 2015)
2014 Best Oral Presentation Award (KSNM Annual Scientific Meeting 2014)

Grants
2020 Basic research grant, National Research Foundation, Korea
2019 General Research Grant, Korean Society of Cardiology
2019 Research grant, Chonnam National University Biomedical Research Institute

Selected publications


Abstract

Nuclear Imaging

Positron emission tomography (PET) can visualize pathophysiologic processes involved in the development and progression of various valvular heart diseases based on several radiotracers.

F-18 sodium fluoride (NaF) is taken up by actively calcifying bones by integration as fluoroapatite. Its role in plaque imaging has long been appreciated by detecting microcalcification which precedes gross calcification. Particularly in aortic stenosis (AS), valvular F-18 NaF activity correlates with the disease severity and predicts future calcification of native aortic valve and degeneration of bioprosthetic valve as well.

F-18 fluorodeoxyglucose (FDG) is an analogue of glucose, which enables the visualization of active inflammatory cells recruiting in the infected valves. Especially, prosthetic valve endocarditis, for which the conventional imaging tools are insufficiently sensitive, FDG PET can be used for accurate diagnosis. It could change diagnosis from equivocal to definite ones by detecting valve infection. Leukocyte imaging can be used instead of FDG PET when the interval between valvular surgery and the clinical presentation of infection is within 2–3 months.

Bone scintigraphy can be used for detecting transthyretin cardiac amyloidosis (ATTR CA). AS is frequently accompanied by ATTR CA, which is associated with poorer prognosis. Bone scintigraphy has an excellent sensitivity and specificity in ATTR CA, which now has an effective treatment option (e.g. tafamidis).
**Educational Course 3**

*Coronary artery*

**Chairperson(s)**

- Prof. Jung Im Jung (KOR)
- Dr. Sutipong Jongjirasiri (THA)

**Speaker/Lecturers**

- Prof. Hoang Minh Loi (VNM)
- Prof. Jung Im Jung (KOR)
- Dr. Eun Ju Chun (KOR)
- Prof. Hajime Sakuma (JPN)

**Day 2 – August 20 (Friday) / Channel 2**

14:00 - 15:30 (GMT + 7)

14:00: **Optimal CTA protocol**

   Prof. Hoang Minh Loi (VNM)

14:20: **Coronary artery anomaly**

   Prof. Jung Im Jung (KOR)

14:40: **Atherosclerotic Vulnerable Plaque: Current Perspectives**

   Dr. Eun Ju Chun (KOR)

15:00: **MR coronary angiography**

   Prof. Hajime Sakuma (JPN)
Speaker

Prof. Hoang Minh Loi (VNM)

(VNM)

Abstracts

Optimal CTA protocol
Jung Im Jung (MD, PhD, Prof) graduated from The Catholic University of Korea in 1992. Since 2011, she serves as a professor of radiology at the Seoul St. Mary’s Hospital, The Catholic University of Korea. Over the past years, she has continued and expanded her research activities in cardiovascular and thoracic imaging. She served for the Korean Society of Cardiovascular Imaging (KOSCI) and the Korean study group of cardiac MR (KCMR) as president in the past. She is currently the assistant Secretary-General of Administration Office of Asian Society of Cardiovascular Imaging (ASCI), and editor-in-chief of the Journal of the Korean Society of Radiology (JKSR).

**Abstract**

**Coronary artery anomaly**

With the rise in the use of coronary CT angiography (CTA), the number of incidentally found coronary artery anomalies have increased. CTA provides an accurate assessment of coronary artery anomaly including coronary artery origin, course, destination, luminal narrowing, and relationship to surrounding structures. However, the clinical significances of variable coronary artery anomalies are not well understood due to limited data. Coronary artery anomalies have variable presentations ranging from a benign incidental finding to hemodynamically significant abnormalities, sudden cardiac death. This educational lecture presents the CTA features of common coronary artery anomalies encountered in daily clinical practice and provides their clinical significance gleaned from recent researches. We will also discuss the coronary artery fistula and the anomalous origin of the coronary artery arising from the opposite sinus, the recently highlighted coronary artery anomalies.
Dr. Eun Ju Chun
(KOR)
Radiologist: cardiovascular imaging
Seoul National University Bundang Hospital

Education
1990-1994 College of Medicine, Ewha Womans University (M.D.)

Post-Graduate Education
1999-2001 Graduate School, Korea University (M.S.)
2002-2005 Graduate School, Korea University (Ph.D.)

Academic Appointments
1994-1995 Intern, Ewha Womans University Hospital
1995-1999 Resident in Radiology, Ewha Women’s University Hospital
2005-2007 Clinical Fellow in Radiology, Seoul National University Hospital
2007-2015.03 Assistant Professor, Department of Radiology
Seoul National University Bundang Hospital
2012.8-2013.7 Clinical Fellow in Radiology, Massachusetts General Hospital
(MGH), Harvard Medical University
2015.4-2019. Associate Professor, Department of Radiology
Seoul National University Bundang Hospital
2019.09 - Professor, Department of Radiology
Seoul National University Bundang Hospital

Professional Affiliations and Scientific Publications
Board of committee member, Korean Society of Cardiovascular Imaging
2014.10 - Chair of Scientific and education committee, Cardiovascular Imaging in
Computed Tomography Summit (CIVICS)
2018.07 - Editorial board member of Korean Journal of Radiology
2019.03 - Chair of Society of Korean cardiovascular MR imaging commettee
Total 169 SCI journals

Lim S, Hayley S, Lee Y, Yoon JW, Kang SM,. Chun EJ. Impact of Metabolic Syndrome on
Coronary Artery Stenosis and Plaque Characteristics assessed by 64-slice Multidetector-row Cardiac Computed Tomography. Radiology 2011; Nov 261(2): 437-45


Shin YJ, Lee JH, Yoo JY, Kim JA, Jeon Y, Yoon YE, Chun EJ. Clinical significance of evaluating coronary atherosclerosis in adult patients with hypertrophic cardiomyopathy who have chest pain. Eur Radiol. 2019 Sep;29(9):4593-4602

Yoon SH, Kim E, Jeon Y, Yi SY, Bae HJ, Yoo SM, White CS, Chun EJ. Prognostic Value of Coronary CT Angiography for Predicting Poor Cardiac Outcome in Stroke Patients without Known Cardiac Disease or Chest Pain: The Assessment of Coronary Artery Disease in Stroke Patients Study. Korean J Radiol. 2020 Sep;21(9):1055-1064 etc.
Abtracts

Atherosclerotic Vulnerable Plaque: Current Perspectives

Atherosclerosis is the most common form of vascular disease and the one of the leading pathology of death in the world. Atherosclerotic plaques are asymmetric focal thickenings of the intima due to accumulation of foamy macrophages, inflammation, smooth muscle cells, lipid and calcium. Whereas stabilized atherosclerotic lesions progress slowly, vulnerable plaques suddenly rupture and cause thrombosis, resulting in acute coronary syndrome (ACS).

The vulnerable plaque is defined as rupture-prone plaque. Plaque that tends to progress rapidly is also considered to be vulnerable. Until now, most subsequent clinical studies narrowed the scope by focusing on intrinsic (structural) determinants of instability, such as quantitative and qualitative composition and remodeling. Therefore, morphological characteristics of vulnerable plaques have been known to encompass a number of features, including the presence of a thin fibrous cap with a large lipid core, intraplaque hemorrhage, and the presence of intraplaque active inflammation.

For the detection of vulnerable plaque, various imaging modalities such as IVUS, OCT and CT have been used with good correlation of pathology. Among them, coronary CT angiography (CCTA) has widely used because it has significant advantage as follows; 1) noninvasiveness, 2) ability for imaging the whole coronary vasculature, and 3) potential for assessing both vessel wall in addition to the lumen.

Along with the substantial improvement of the relevant medical noninvasive imaging, these vulnerable plaque concept has led to tremendous advances in the treatment of atherosclerosis. However, the effects of extrinsic stressors (eg, dynamic pressure/pressure head, turbulent/laminar flow) also should be considered because the complex interplay between intrinsic and extrinsic factors affects the pathophysiology of atherosclerosis.

In this lecture, I would like to introduce the pathophysiology and progress of atherosclerosis, and the morphological features of vulnerable plaque in various imaging modalities, including the benefits and drawbacks of each imaging modalities. In addition, I’d like to discuss the change of the concept of vulnerable plaque from the perspective of “preventing is better than treating”.

Speaker

Prof. Hajime Sakuma
(JPN)

Professor and Chairman, Department of Radiology
Mie University Graduate School of Medicine
Deputy Director of Management, Mie University Hospital

Email sakuma@med.mie-u.ac.jp

Education and Employment

1985 Graduated from Mie University School of Medicine,
1985-1987 Resident in Radiology, Mie University Hospital
1987-1988 Clinical Fellow in Radiology, Mie University Hospital
1988-1989 Assistant Professor, Department of Radiology
Fukui Medical School, Fukui, Japan
1989-1991 Assistant Professor, Department of Radiology
Mie University Hospital
1991-1996 Postdoctoral Research Fellow, Department of Radiology
University of California, San Francisco
1996- Senior Lecturer, Department of Radiology
Mie University School of Medicine
1998- Associate Professor, Department of Radiology,
Mie University Hospital
2009 Chief, Department of Radiology, Mie University Hospital
2012 Professor and Chairman, Mie University Graduate School of Medicine
2015 Deputy Director, Mie University Hospital

License and Certification

1985 Japanese Medical License
1990 Japanese Board of Radiology
1990 Japanese Board of Nuclear Medicine

Membership

2006-2010 Board of Trustee, Society for Cardiovascular Magnetic Resonance
2017-2019 President, Asian Society of Cardiovascular Imaging (ASCI)

Honors

2014 1st Gold Award, Asian Society of Cardiovascular Imaging
2015 Senior Fellow, International Society for Magnetic Resonance in Medicine

Publications in English: >200 papers in peer-reviewed journals in English.
Abstracts

MR coronary angiography

While CMR is considered the gold standard for evaluating cardiac function, morphology and tissue characteristics, coronary artery stenosis is widely evaluated with coronary CTA. Although modern CT technology has enabled coronary CTA to be performed at very low doses, the ionizing radiation from coronary CTA cannot be ignored in pediatric and young adult patients, as well as in patients who need to undergo serial CT examinations. Coronary MRA, on the other hand, is a non-ionizing radiation modality that can be performed without injecting contrast media and is particularly useful for patients with highly calcified coronary arteries. The clinical indication for coronary MRA was initially the evaluation of coronary artery abnormalities and coronary aneurysms in Kawasaki disease. However, in the last decade, the CAD diagnostic capability of coronary MRA has improved dramatically. At our institution, coronary MRA of the whole heart using 3T contrast medium was diagnostic in 92% of patients with a mean acquisition time of 7.0±1.8 minutes. The sensitivity and specificity of coronary MRA were 95.9% and 86.5%, respectively, making the diagnostic performance of coronary MRA comparable to that of 64-slice MDCT. A major problem in coronary MRA has been the long acquisition time. Compressed Sensing (CS) is a new technology that speeds up MR imaging, allowing for an 8-fold scan acceleration while maintaining diagnostic image quality and contrast/noise ratio. Thus, whole heart coronary MRA of excellent quality can be obtained in a few minutes of scan time. Operator dependency has been a major limitation of coronary MRA. Free-running 3T 5D whole heart coronary MRA with continuous 3D golden angle radial sampling, self-gating signal extraction, and compressed sensing reconstruction is a new approach that dramatically reduces scan complexity and delivers high quality 5D whole heart coronary MRA in 8 minutes.
DAY 2 – AUGUST 20 (FRIDAY) / CHANNEL 3

14:00 - 15:30 (GMT + 7)

Refresh course 2

TAVR

Chairperson(s)

Prof. Do Doan Loi (VNM)

Prof. Tae Hoon Kim (KOR)

Speaker/Lecturers

A/Prof. Tan Swee Yaw (SGP)

Prof. James Kirkpatrick (USA)

Prof. Jean-Nicolas Dacher (FRA)

14:00    Clinical update

A/Prof. Tan Swee Yaw (SGP)

14:20   Echocardiography approach

Prof. James Kirkpatrick (USA)

14:40     Cardiac CT planning: from A to Z

Prof. Jean-Nicolas Dacher (FRA)

15:00     Post TAVR: what is the issue?

Prof. Jean-Nicolas Dacher (FRA)
Speaker

A/Prof. Tan Swee Yaw
(SGP)

Senior Consultant Cardiologist, National Heart Centre Singapore
(Cardiac CT Angiography and Cardiac Rehabilitation)
Clinical Associate Professor, Duke NUS School of Medicine
Clinical Tutor - National University of Singapore, Yong Loo Lin Medical School

Email  tan.swee.yaw@singhealth.com.sg

Memberships

- Asian Society of Cardiovascular Imaging - Executive Committee
- European Society of Cardiology - Fellow
- Society of Cardiac Computer Tomography - Fellow
- Singapore Cardiac Society - Website Editor - Council Member

- Singapore Heart Foundation - Member
- American Heart Association - Member
- American College of Cardiology - Member

Appointments

- Editor – Proceedings of Singapore Healthcare (POSH) -2020 Current
- Organising Chair Asian Society of Cardiovascular Imaging - Chair
- Singapore National Haze Advisory Panel - Member
- Singapore Heart Failure Guidelines (2014 Committee) - Member
- Singapore Ministry of Health (MOH) (Sub-committee on Cardiac Rehabilitation) (2011) - Member
- Editorial Committee – Kaiser Permanante Journal - Member

Research Interests

- Sports Cardiology and Exercise Physiology
- Cardiac CT Angiography and Calcium scoring
- Cardiac Rehabilitation and Preventative Cardiology
- Cardiac CT AI and CTFFR
- Undergraduate Training and Academic Awards and Prizes
MBChB University of Edinburgh (1993-1998)

- Junior Mckenzie Prize in Anatomy (1994)
- Distinction Medical Biology (1994)
- Merit Award for Anatomy (1994)
- Higher Medical Development Programme (HMDP) at Stanford University and Northern California (Cardiac CT and Rehabilitation) (2005)
- Khoo Clinical Scholar Award (2010)

Post Graduate Qualifications and Courses

- Full MRCP accreditation with Edinburgh Collegiate (2001)
- Fellow of Academy of Medicine Singapore (2005)

Basic Medical Training (Residency)

Western General Hospital, Edinburgh, Scotland - Housemanship
Royal Infirmary of Edinburgh, Scotland, United Kingdom – RIE Medical Rotation for SHOs (2 year Rotation) (Aug 1999 - Aug 2001)
Cardiology in National Heart Centre Singapore (Aug 2001- Jul 2002)
Supervisors: A/Prof. Koh TH (Medical Director), Dr T Chua (Head of Department), Dr BA Johan (Director of Cardiac Rehabilitation)
Cardiology Fellow/Registrar Training

- Appointed AST Cardiology trainee on 1st July 2002-2005
- Commenced as Registrar in NHC on 1st July 2002-2005


- Health Manpower Development Programme for cardiac rehabilitation, preventative cardiology and Cardiac CT - Stanford University and Northern California.

Prior Clinical Trial Involvement

- ADORE II Trial co-investigator
- ISIS - RADICHOL co-investigator
- Rocket-AF Trial co-investigator
- OASIS 5 Trial co-investigator
- Mediwatch Trial co-investigator
• Depression post MI trial co-investigator
• COSIMA II Principle investigator (PI)
• CL3-16257-067 (Ivabradine Safety Trial) (PI)
• TECOS Trial Co-investigator

Publications

Original Articles


Abstracts

Clinical update
Speaker

Prof. James Kirkpatrick

(USA)

Pomona College (cum laude), Claremont, CA
Loma Linda University School of Medicine, Loma Linda, CA
Yale New Haven Hospital, New Haven, CT
University of Chicago, Chicago, IL

Personal Statement

Dr. Kirkpatrick is Section Chief of Cardiac Imaging for the Division of Cardiology and directs the Echocardiography Lab at the University of Washington Medical Center (UWMC) and the Advanced Cardiology Imaging Fellowship. He has expertise in all echocardiographic modalities, including strain imaging, 3D, stress echocardiography and transesophageal echocardiography. He mentors cardiology fellows, internal medicine residents, medical students and undergrad students working on projects in echocardiography.

He has contributed significantly to the literature on echocardiography education and training, both in point of care and advanced echocardiographic techniques. He is past chair of an ASE task force on echo lab training in cardiac point of care ultrasound and key participant in the Critical Care Echocardiography Special Interest Group of the ASE. He has served on the ASE board of directors. He is the ASE 2021 Scientific Sessions Abstracts co-chair and has served on the ASE and American College of Cardiology Scientific Sessions program committees for the past 2 years, serving as the ASE Scientific Sessions Function Track chair this year.

Dr. Kirkpatrick has extensive experience working on echocardiography-related projects focused on point of care ultrasound, in lower and middle income countries (LMIC). He led 3 outreach projects involving research, clinical care and education on behalf of the ASE Foundation to Vietnam (2013, 2015, 2017). In addition, he is a significant contributor to research work using echocardiography to screen for rheumatic heart disease in Nepal (see contribution to science #1), and is currently collaborating on a project in Kenya. He conceived and led one of the few investigations into the use of point of care ultrasound in the United States inner city setting. He was on the writing group for the American College of Cardiology Advance Training Statement for echocardiography.

In addition, Dr. Kirkpatrick has lectured and published on the topic of echocardiographic assessment of mechanical circulatory devices and was a co-author on the ASE guidelines on echocardiography in the management of patients with left ventricular assist devices.
2013-2015  - Assistant Professor of Medical Ethics and Health Policy, University of Pennsylvania School of Medicine
2015  - Associate Professor of Medicine at the Hospital of the University of Pennsylvania, University of Pennsylvania School of Medicine
2015-present  - Associate Professor of Medical Ethics and Health Policy, University of Pennsylvania School of Medicine
2015-present  - Associate Professor of Medicine, University of Washington
2016-2019  - Director, Echocardiography, University of Washington
2017  - Ethics Committee, University of Washington
2016-2019  - Ethics Consultation Service, University of Washington Medical Center
2019-present  - American Society of Echocardiography Board of Directors
2019-present  - Grace Marie Kaylor Endowed Award in Cardiology, Division of Cardiology, University of Washington
2019  - Names to list of Top 27 Cardiologists Honor Roll—Forbes Magazine-Grand Rounds
2020-2023  - Adjunct Associate Professor, Department of Bioethics and Humanities, University of Washington School of Medicine
2021-2022  - Section Chief, Cardiac Imaging, University of Washington Division of Cardiology
2020-2021  - Professor of Medicine, University of Washington School of Medicine Adjunct Professor, Department of Bioethics and Humanities, University of Washington School of Medicine
2020-present:  - Vietnam Heart Institute Appreciation Award
2021-2022  - Chair, American College of Cardiology Geriatrics Section
2020-2021  - Chair Elect, American College of Cardiology Ethics Board
2020-present:  - American Society of Echocardiography Foundation Board of Directors
2020-present:  - D1 Governance Committee, Division of Cardiology, University of Washington
2020-present:  - Equity, Diversity and Inclusion Task Force, Division of Cardiology, University of Washington
Abstracts

Echocardiography approach

Transcatheter therapies are revolutionizing the care of patients with valvular heart disease. As with most new and old therapies in cardiology, echocardiography plays a key role in establishing therapeutic indications through diagnosis and characterization of disease, guiding interventions and monitoring for therapeutic response and complications. Transcatheter aortic valve replacement/intervention (TAVR/TAVI) relies on echocardiography for the diagnosis and characterization of aortic stenosis and aortic regurgitation, assessment of correct valve placement without significant perivalvular regurgitation, pericardial effusion, or ischemic left ventricular dysfunction and follow up assessment of valve placement, regurgitation, prosthetic stenosis and patient-prosthesis mismatch, and ventricular remodeling. This overview of the role of echocardiography in TAVR/TAVI will include echo-based findings in aortic valve diseases that impact on transcatheter interventions, procedural assessment, and key aspects of prosthetic valve imaging, emphasizing the importance of comprehensiveness and quality.
Jean-Nicolas Dacher is a cardiac radiologist and a Professor of Radiology and Medical Imaging appointed by the University and the « Centre Hospitalier et Universitaire » of Rouen-Normandy in France.

He is the Chief of the Department of Radiology and the Head of the Cardiac imaging unit including Cardiac CT and MRI facilities. He is also a member of the Research INSERM unit UMR1096 (Pharmacology and endothelial/myocardial dysfunction).

Cardiac Imaging has been a high priority of the University Hospital of Rouen since many years considering the advent and development of Transcatheter aortic valve implantation (First in man implantation was performed in Rouen in 2002 by Alain Cribier and his interventional cardiology team).

Jean Nicolas Dacher is involved in many sub specialties of cardiology with a special interest in coronary artery disease, cardiomyopathies, congenital cardiopathies and of course valvular heart disease.

He is a member of the Société Française de Radiologie (SFR), European Society of Radiology (ESR) and belongs to the Executive Committee of the European Society of Cardiac Radiology (ESCR). He is also an active member of the Editorial Committees of the journals “European Radiology” and “Diagnostic and Interventional Imaging” (Cardiac Imaging sections).

He authored or co-authored approximately 200 journal articles and several book chapters and have given many lectures in cardiac imaging either in the French speaking or international community.
Abstracts

Cardiac CT planning: from A to Z

Multidetector Computed Tomography (CT) has become a cornerstone examination prior to transcatheter aortic valve replacement (TAVR). Vascular approach (preferably femoral) was historically the first indication of CT. CT was shown to be superior to conventional angiography due to its capabilities of showing all vessel segments in their short axis from the femoral artery up to the aortic root. Peculiar attention is brought to the analysis of the arterial puncture that is performed at the level of the centre of the femoral head. Ilio-femoral arteries sinuosities, calcifications and stenosis should be reported as well as aneurysm, fistula or dissection. At cardiac level, the radiologist has to evaluate many landmarks. Among them, annulus size at systole (diameters, area and perimeter), distances from the annulus to the coronaries and sinus of Valsalva height and diameters are essential.

Radiologic evaluation of the thorax and abdomen contributes frequently to the final decision in this age range.

Structured report including key images should be prepared and transmitted to the cath lab as well as all pertinent images in DICOM format. Radiologist is a crucial partner of the heart team; all discrepancies should be discussed and lead to a consensus decision about treatment in all its aspects.

In this lecture, the technical aspects of the acquisition will be covered as well as the basics of analysis and reporting. Representative cases will be illustrated.
**Abstracts**

**Post TAVR: what is the issue?**

After transcatheter aortic valve replacement (TAVR), conventional angiography and transthoracic echocardiography are usually performed to evaluate prosthesis positioning, regurgitation and baseline transvalvular gradient. Although CT is not systematically performed postoperatively, it could be discussed in certain situations. In the acute setting, it may be helpful to confirm and locate an acute bleeding prior to endovascular treatment. Later on, the major indication of CT is to search for thrombosis or hypoattenuating leaflet thrombosis (HALT) in patients with either recurrent symptoms or increased gradients. In such situation, anticoagulant therapy can be started then controlled by a follow-up CT several weeks later. Calcification of the prosthetic cusps is usually the sign of valve degenerescence and urges a new treatment, usually endovascular (valve in valve).

Technical aspects of CT will be covered in this lecture as well as the basics of reporting.
DAY 2 – AUGUST 20 (FRIDAY) / CHANNEL 1

16:00 - 17:30 (GMT + 7)

**Special focus 2**  
*Team Approach: Cardio-oncology*

**Chairperson(s)**
- Prof. Mai Trong Khoa (VNM)
- Dr. Lilian Leong (HKG)

**Speaker/Lecturers**
- Prof. Ta Manh Cuong (VNM)
- Dr. Carmen Chan (HKG)
- Dr. Yoo Jin Hong (KOR)
- Dr. Eui-Young Choi (KOR)

**Program**

16:00    **Cardiac tumors: diagnosis and management**  
*Prof. Ta Manh Cuong (VNM)*

16:20    **Role of Echocardiography**  
*Dr. Carmen Chan (HKG)*

16:40    **CMR: state of the art**  
*Dr. Yoo Jin Hong (KOR)*

17:00    **Clinical Cases Challenges**  
*Dr. Eui-Young Choi (KOR)*
Speaker

Prof. Ta Manh Cuong
(VNM)
Vietnam Heart Institute
Bach Mai Hospital
Email manhcuongclinic@yahoo.com

Education
Graduated as a doctor in 1989 at Hanoi Medical University

Post-Graduate Education

Academic Appointments
Cardiologist
Echocardiography Specialist
Specialist in intensive care cardiovascular disease

Professional Affiliations and Scientific Publications
Deputy Director of Vietnam Heart Institute - Bach Mai Hospital, Hanoi
Head of Cardiovascular Emergency and Intensive Care Unit – Vietnam Heart Institute
Member of Executive Committee of Vietnam Heart Association
Member of Executive Committee of Vietnam Association of Emergency Resuscitation and Poison Control
Member of Executive Committee of Hanoi Association of Emergency Resuscitation and Poison Control
Member of Vietnam Internal Medicine Association, American Heart Association, European Heart Association, American Society of Echocardiography
Published more than 40 specialized articles in domestic and foreign journals, authored and co-authored specialized textbooks, monographs, and reference books.


Abstracts

Cardiac tumors: diagnosis and management

Cardiac tumors are rare but remain an important component of cardio-oncology practice. Over the past decade, the advances in imaging techniques have enabled a noninvasive diagnosis in many cases.

Cardiac tumors are divided into primary and secondary forms. Secondary malignancies (metastatic) are the most frequent, with a 20 – 40 times higher incidence than primary tumors.

Approximately 10% of primary cardiac tumors are malignant and 90% benign. The benign cardiac tumors include myxomas, rhabdomyoma, fibromas, lipomas, hemangiomas, papillary fibroelastomas, cystic tumors of the atrioventricular node, and paragangliomas. Myxomas are the most common benign cardiac tumors. The malignant primary cardiac tumors are usually pathologically described as sarcomas. Cardiac sarcomas include angiosarcomas (mostly common), rhabdomyosarcoma, leiomyosarcoma, synovial sarcoma, osteosarcoma, fibrosarcoma, myxoidsarcoma, liposarcoma, mesenchymal sarcoma, neurofibrosarcoma, and malignant fibrous histiocytoma.

Secondary tumors are more frequently encountered since the heart can theoretically be a site of metastasis by any malignant neoplasm. In decreasing order, the tumors with the highest rate of heart metastasis are pleural mesothelioma (48.4%), melanoma (27.8%), lung adenocarcinoma (21%), undifferentiated carcinomas (19.5%), lung squamous cell carcinoma (18.2%), and breast carcinoma (15.5%), ovarian carcinoma (10.3%), lymphomyeloproliferative neoplasms (9.4%), bronchioalveolar carcinomas (9.8%), gastric carcinomas (8%), renal carcinomas (7.3%), and pancreatic carcinomas (6.4%).

Clinical presentation of cardiac masses depend on the size, location and type of tumor but include constitutional symptoms, valvular or inflow-outflow tract obstruction, thromboembolism, and arrhythmias.

Imaging modalities such as echocardiography, cardiac magnetic resonance, computed tomography, and positron emission tomography are important tools for diagnosing and characterizing the lesions. But histopathological characterization remains the diagnostic gold standard.

Surgical removal of benign cardiac tumors or masses should always be considered in the setting of left-sided and endocavitary lesions due to the embolic risk. For right-sided and asymptomatic benign cardiac tumors, in the absence of a patent foramen ovale or septal defects, strict echocardiographic follow-up can be employed. All symptomatic benign tumors should be surgically resected.
Although complete resection is the treatment of choice for sarcomas, most patients develop recurrent disease and die even if their tumor can be completely resected.

Treatment of metastatic cancer depends on tumor type and origin; prognosis is generally poor.
Dr Carmen Chan was graduated from the University of Hong Kong. She is currently being the Consultant Cardiologist and the Clinical Honorary Associate Professor at Department of Medicine, Queen Mary Hospital, University of Hong Kong. She is sub-specialized in advanced non-invasive cardiac imaging and has undergone one year fellowship training at Brigham and Women’s Hospital, Harvard Medical School. Apart from providing clinical service, she is also interested and actively involved in clinical researches, guideline and reviewer in several peer group review journals and author of book chapters. She is also a council member of the Hong Kong College of Cardiology and the convener of CMR chapter and Women’s Heart Health Campaign. She is also the founding member and the international liaison officer of ASCI and the program chair of ASCI 2022 (Hong Kong)
Role of Echocardiography

Cardio-oncology is a rapidly developing subspecialty that not only focuses on the detection but also monitoring and management of cardiac complications related to cancer treatment.

Just in the year 2018 alone, more than 18 million cases are newly diagnosed cancer. Among them, more than half will survive in the next decade or even longer with the prosperity of available novel chemotherapies. As such, we are facing the unprecedented interlinking relationship between oncology and cardiac complications, not to mention many of those patients are vulnerable elderly that have already multiple medical comorbidities at baseline.

Echocardiography is a key diagnostic imaging tool in the diagnosis and surveillance for many of these complications. Among the different types of pharmacological treatment, patients undergoing treatment with anthracyclines and/or human epidermal growth factor receptor (HER) 2-positive targeted treatment (e.g., trastuzumab and pertuzumab) form a significant proportion of cardio-oncology patients undergoing echocardiography.

This session will focus on the update on the recommended protocol for baseline and surveillance echocardiography assessment for patients undergoing treatment with anthracyclines and/or trastuzumab. The strength and weakness of various techniques including 2D, 3D and strain will be discussed.
Abstract

CMR: state of the art

Recently, significant attention has been focused on the field of cardiooncology. A clinical guideline for cardiovascular toxicity was developed by the European Society of Cardiology. Many cancer therapies cause heart problems. These cancer therapies include chemotherapy, target agents, mediastinal irradiations. These therapies cause LV dysfunction, hypertension and other conditions such as arrhythmias, coronary artery diseases, and thrombus formation and HF from cancer therapy has worse prognosis the idiopathic cardiomyopathy.

The previous study proved that early diagnosis and prompt treatment are vital for a better diagnosis. In this study, more than 90% of cases within within 1 year of initiating chemotherapy. Early treated group showed better prognosis than the other group.

In this context, I would like to discuss some of the promising applications of magnetic resonance imaging (MRI) in cardiooncology. The main strength of cardiac MRI is tissue characterization. MRI would be useful in the field of cardiooncology.
**Speaker**

**Dr. Eui-Young Choi**

(KOR)
Division of Cardiology, Heart Center, Gangnam Severance Hospital
Yonsei University College of Medicine

**EDUCATION**
- Mar.1989 - Feb.1995  Yonsei University College of Medicine, Seoul, Korea
- Aug.1997 - Aug.2002  Master of Medical Science Yonsei University Graduate School, Seoul, Korea
- Sep.2004 - Feb. 2008  Ph. D of Medical Science Yonsei University, Seoul, Korea

**LICENSE & CERTIFICATE**
- Mar.1995  License in Medicine (No. 56978)
- Mar.2000  Diplomate, Korean Board of Internal Medicine (No.6921)
- Oct. 2005  Korean Subspeciality Board of Cardiology (No. 2-05-500)

**ACADEMIC & HOSPITAL APPOINTMENT**
- Mar. 1995  -  Feb. 1996   Internship Gangnam Severance Hospital, Yonsei University
- Mar. 1996  -  Feb. 2000   Residency in Internal Medicine Gangnam Severance Hospital, Yonsei University College of Medicine, Seoul, Korea
- May. 2003  -  Feb. 2005   Lecturer of Internal Medicine Yonsei University College of Medicine, Seoul, Korea
- Mar. 2005  -  Feb. 2006   Instructor in Internal Medicine Yonsei University College of Medicine, Seoul, Korea
- Mar. 2006  -  Feb. 2010   Assistant Professor in Internal Medicine
- July. 2009  - June. 2011   Post-doctoral fellowship, Division of Cardiology, Johns Hopkins School of Medicine, Baltimore, USA 
- Yonsei University College of Medicine, Seoul, Korea
- Mar. 2010 – Feb. 2015   Associate Professor in Internal Medicine
- Yonsei University College of Medicine, Seoul, Korea
- Mar.2015- current   Professor in Internal Medicine, Gangnam Severance Hospital
- Yonsei University College of Medicine, Seoul, Korea
Abstract

Clinical Cases Challenges

Cancer patients have higher prevalence of venous thrombosis. Therefore, early detection of pulmonary thromboembolism and deep vein thrombosis is important to reduce cancer or chemotherapy related cardiovascular events. Recently, numerous chemotherapy or immune modulating agents were developed. However, all these agents have some toxic or adverse effects on heart. Therefore, periodic imaging follow-up during treatment with echocardiography, CMR or nuclear imaging is essential. Speckle or feature tracking imaging with echo or CMR, LGE and T1 mapping with CMR could sensitively detecting this adverse effect on heart. In this session, I will talk about role of each modality and advantage and pitfalls of each modality with clinically challenging cases.
DAY 2 – AUGUST 20 (FRIDAY) CHANNEL 2

16:00 - 17:30 (GMT + 7)

**Educational course 4**

*Cardiomyopathy Essentials*

**Chairperson(s)**

A/Prof. Hoang Minh Loi (VNM)

Dr. Sanjaya Viswamitra (IND)

**Speaker/Lecturers**

Dr. Karen Ordovas (USA)

Dr. Noriko Oyama-Manabe (JPN)

Dr. Nguyen Ho Thi Nga (VNM)

Dr. Lei Xu (CHN)

16:00  HCM

*Dr. Karen Ordovas (USA)*

16:20  Amyloidosis and Sarcoidosis

*Dr. Noriko Oyama-Manabe (JPN)*

16:40  Myocarditis

*Dr. Nguyen Ho Thi Nga (VNM)*

17:00  The Role of CMRI in HF

*Dr. Lei Xu (CHN)*
Speaker

Dr. Karen Ordovas
(USA)

She specializes in advanced Cardiac and Pulmonary Imaging, in particular cardiovascular MR and CT. She received her medical degree from Universidade Federal do Rio Grande do Sul, Brazil, and completed her residency in Radiology at the Instituto de Cardiologia do Rio Grande do Sul and Mae de Deus Hospital, Brazil. She has completed research and clinical fellowships in CardioThoracic Radiology at the University of California San Francisco (UCSF), and earned a Masters Degree in clinical research from the Department of Epidemiology and Biostatistics at UCSF.

She is a fellow of the Society of Cardiovascular MRI (SCMR), American Heart Association, and North American Society for Cardiovascular Imaging (NASCI).

In addition to serving at the SCMR Executive Board as Treasurer, Dr. Ordovas is deeply engaged in the main radiology and cardiology societies on her field. She is past-president of NASCI, Chair of the American College of Radiology Cardiology Research Committee, and Co-Chair of the RSNA cardiac program subcommittee. Dr. Ordovas’ research interests include establishing evidence-based applications for CMR and CCT in several clinical settings, with emphasis on non-ischemic cardiomyopathies, women cardiovascular diseases, and adults with congenital heart disease.

Dr. Ordovas has more than 100 peer-reviewed articles and 26 book chapters. Her articles have appeared in the Radiology journal, the American Journal of Cardiology, the JACC Cardiovascular Journal, and Stroke: A Journal of Cerebral Circulation.

Abstracts

Patients with Pacemakers/ICDs: is this safe for CMR

In this lecture, we will review MRI safety issues related to imaging patients with pacemaker and ICDs, including MRI safe and MRI conditional devices. We will also review practical safety protocols that can be implemented to ensure a CMR program is successful in patients with these devices. Finally, we will discuss novel CMR techniques for diminishing artifacts when imaging these patients and we will review the most common CMR indications for patients with Pacemaker/ICD.
Speaker

Dr. Noriko Oyama-Manabe (JPN)
Professor, Department of Radiology
Jichi Medical University Saitama Medical Center

Clinical and academic experience
MD. (1997) and PhD. (2005), from Hokkaido University Graduate school of medicine, Sapporo, Japan
2002 Board certification for Diagnostic Radiology
2003 Board certification for Nuclear Medicine
2007 Board certification for PET
2004-2007 Research fellow, Beth Israel Deaconess Medical Center, Harvard Medical School, Boston, U.S.A.
2008-2010 Assistant Professor, Hokkaido University Hospital
2011-2015 Lecturer, Hokkaido University Hospital
2016-2019 Associate Professor, Hokkaido University Hospital
2020 Professor, Dept. of Radiology, Jichi Medical University Saitama Medical Center,

Membership:
A member of a delegation at Japan Radiological Society
Executive board member at Japanese Society of Cardiovascular Computed Tomography
Executive board member at Japanese Society of Cardiovascular imaging and dynamics
Executive board member at Japan Society of Cardiovascular Radiology
A member of Japanese Society of Nuclear Medicine, Japanese Circulation Society,
Japanese Society for Magnetic Resonance in Medicine, Society of cardiovascular computed tomography, American Roentgen Ray society, and Asian society of cardiovascular imaging

Prize-winning list:
2008: Japanese Society of Magnetic Resonance Imaging, Research award
2010: Radiological Society of North America (RSNA), Cum Laude award
2010 European Congress of Radiology (ECR), Certificate of Merit award
2011 European Congress of Radiology (ECR), Certificate of Merit award
2017 Congress of Asian society of cardiovascular imaging (ASCI), Best moderated poster award
2017 Radiological Society of North America (RSNA), Certificate of Merit award
2018 Japanese Radiological Society (JRS), annual meeting, Gold Medal prize
**Abstracts**

**Amyloidosis and Sarcoidosis**

CMR provides a noninvasive and multidimensional assessment by allowing for the detection of morphological abnormalities, abnormal ventricular function, edema and myocardial scar. Late gadolinium enhancement (LGE) on CMR is an effective technique for the diagnosis of non-ischemic cardiomyopathies such as cardiac amyloidosis and sarcoidosis. CMR has high diagnostic accuracy and prognostic value for both etiologies.

Tissue characterization techniques such as T1 mapping with measurement of extracellular volume fraction ECV, and T2 mapping have been validated against histological findings in a wide range of clinical scenarios. Additionally, feature tracking and strain imaging provide quantitative information of global and regional wall motion abnormality.

In my presentation, quantitative aspects of estimating extent and severity of cardiac amyloidosis and sarcoidosis.
Speaker

Dr. Nguyen Ho Thi Nga
(VNM)
Cho Ray Hospital, Viet Nam

Education
General doctor (Graduation year 2008) at Pham Ngoc Thach University of Medicine

Post-Graduate Education
- Specialist I, resident doctor in diagnostic imaging (Graduation year 2012) at Ho Chi Minh City University of Medicine and Pharmacy
- Specialist II in Radiologist (Graduation year 2018) at Pham Ngoc Thach Medical School

Academic Appointments
- Participated in teaching primary and specialized classes on diagnostic imaging at Cho Ray hospital
- Reporter of the Young Scientific Conference of Pham Ngoc Thach Medical University in 2009
- Speaker of the annual scientific conference of Cho Ray hospital in 2014
- Speaker of the 2014 Vietnamese congress of radiology and nuclear medicine
- Speaker of the 2014 national conference on blood transfusion science
- Speaker of the annual scientific conference of Cho Ray Hospital in 2018
- Speaker of the Southern Open Radiology Scientific Conference 2018
- Speaker of the 2018 Vietnamese congress of radiology and nuclear medicine

Professional Affiliations and Scientific Publications
Research:
- Determine the efficacy of genta cyanosis in patients with oral candidiasis (2008)
- Determine between dimensional and multidimensional dimensions with spleens on MSCT (2011)
- Relation between serum ferritin and liver, spleen and heart MRI T2* in beta thalassaemia major patients (2014)
- Magnetic resonance imaging findings in acute myocarditis (2018)

Abstracts

Myocarditis
Speaker

Dr. Lei Xu
(CHN)

E-mail leixu2001@hotmail.com

Current Affiliations:
Department of Radiology, Beijing Anzhen Hospital, Capital Medical University

Specialty:
Cardiovascular Imaging

Academic Appointments:
Professor of Radiology

Publications:
more than 60 peer-reviewed English papers

Abstracts

The role of CMRI in HF
The 14th Congress of Asian Society of Cardiovascular Imaging (ASCI 2021)

DAY 3 – AUGUST 21 (SATURDAY) / CHANNEL 1

8:30 - 10:00 (GMT + 7)
Read with the experts

Chairperson(s)

Prof. Do Doan Loi (VNM)
Prof. Jongmin Lee (KOR)

Speaker/Lecturers

Prof. Whal Lee (KOR)
Prof. Ming Ting Wu (TWN)
Prof. Stephen H. Little (USA)
Dr. Hideki Ota (JPN)
Dr. Nguyen Thi Huyen (VNM)
Dr. Carmen Chan (HKG)

8:30  Case 1: Penetrating atherosclerotic ulcer

8:45  Case 2: RCA

9:00  Case 3: TEER

9:15  Case 4: An emergency of Large vessel vasculitis

9:30  Case 5: Acute myocardial infarction in patient with single coronary artery: a case report

9:45  Case 6: The role of multimodality imaging in a patient with pericardial effusion
Speaker

Prof. Whal Lee

(KOR)

Department of Radiology
Seoul National University Hospital

Email whal.lee@gmail.com

Prof. Whal Lee Bio

Prof. Whal Lee graduated with a medical degree from the Seoul National University and got the master degree and PhD degree in the same university. He completed his fellowship and instructor trainings at the Seoul National University Hospital in Korea and Hospital for Sick Children in Canada and is a Professor in Department of Radiology, Seoul National University Hospital and Seoul National University College of Medicine. Prof. Lee is an active member of a number of professional societies including the Korean Society of Radiology, Korean Society of Cardiovascular Imaging, Asian Society of Cardiovascular Imaging, Korean Society of Ultrasound Medicine, Bioengineering society for circulatory disorders, Korean Society of Circulation and Korean Society of Magnetic Resonance in Medicine. During the course of his career, he has published 14 book chapters and 140 SCI/SCIE articles related to radiology and imaging. He is one of editors of Acta Radiologica and an editor in chief of Investigative Magnetic Resonance Imaging. Moreover, he is an assistant secretary general of presidential office and a director of Speaker Bureau of Asian Society of Cardiovascular Imaging. He is also an international liaison director of Korean Society of Radiology and office director of Asian-Oceanian Society of Radiology. Prof. Lee is currently a member of DUR committee of Korea Institute of Drug Safety and Risk Management and a secretary general of Asian Society of Magnetic Resonance in Medicine.

Abstracts

Case 1: Penetrating atherosclerotic ulcer
Speaker

Prof. Ming Ting Wu

(TWN)
Department of Radiology
National Yang Ming Chiao Tong University
Kaohsiung Veterans General Hospital

Email Wu.mingting@gmail.com

Specialty
Cardiothoracic radiology

Education
1979-1984 National Yang-Ming Medical College. MB

Post-Graduate Education
1995-1996 Research fellow, NMR-Center, Massachusetts General Hospital, Boston, Supervisors: Kenneth K. Kwong, & Bruce R. Rosen
1990-1992 Resident and Chief Resident, Dept. of Radiology, Kaohsiung VGH

Academic Appointments
2008-present Professor of Radiology, National Yang Ming Chiao Tung University

Professional Affiliations and Scientific Publications


Abstracts

Case 2: RCA
Dr. Stephen H. Little is the program director for the Cardiovascular Disease Fellowship program at Houston Methodist Hospital and an alumni of the American College of Cardiology (ACC) emerging faculty program and has been heavily involved in national teaching activities for the last decade. Currently he a member of the ACC working group to define structural heart disease training criteria; is a member of the ACC writing group to define valvular heart disease systems of care. For the American Society of Echocardiography (ASE) he is the current vice president; co-chair of the task force for interventional echo training; past chair of the guidelines committee, and a current board member of the ASE foundation.

He is a Professor of Medicine at Weill Cornell Medicine, and adjunct professor of Bioengineering at Rice University. He received his medical degree from McMaster University and completed post graduate training in internal medicine and cardiology at Western University. He completed research fellowships in echocardiography at the University of Ottawa Heart Institute and at Baylor College of Medicine, Houston.

Dr. Little holds the John S. Dunn Chair in Clinical Cardiovascular Research and Education and is the Houston Methodist System Director for Structural Heart. His research activities have focused on novel use of 3-D echocardiography for the quantification of native and prosthetic valve dysfunction as well as imaging guidance for percutaneous structural heart interventions. Research funding provided by the American Heart Association, and the National Sciences Foundation.
Abstracts

Case 3: TEER

The application of transcatheter edge-to-edge repair (TEER) technologies has revolutionized the treatment of significant mitral regurgitation (MR) during the last decade. However, this technology, its application, and the patients selected for such treatment have continued to evolve. The new field of interventional echocardiography has developed to both support and improve these treatment opportunities. In this presentation we will review current issues regarding; patient identification, imaging guidance of such procedures, competing procedures, and the functional evaluation of success or complications. A case-based approach will be utilized to highlight core learning objectives.
Speaker

Hideki Ota  
(JPN)  
Department of Advanced MRI Collaborative Research,  
Tohoku University Graduate School of Medicine  
Email h-ota@rad.med.tohoku.ac.jp

**Education:**

2006  
Ph.D. Diagnostic Radiology, Tohoku University, Graduate School of Medicine, Sendai, Miyagi, Japan

2000  
M.D. Tohoku University, School of Medicine, Sendai, Miyagi, Japan

Specialization:  
Cardiac and vascular Radiology, interventional radiology

**Academic Appointments:**

Oct 2018 – present.  
Associate Prof. Department of Advanced MRI Collaborative Research,  
Tohoku University Graduate School of Medicine, Sendai, Japan

Assistant Prof. Department of Diagnostic Radiology, Tohoku Univ. Hosp. Sendai, Japan.

May 2008- Sep. 2008  
Senior fellow, Department of Radiology, Michigan State University,  
East Lansing, MI.

Sep. 2007- Apr. 2008  
2008 Senior fellow, The Vascular Imaging Lab., Department of Radiology,  
University of Washington, Seattle, WA.

**Professional memberships:**

Japan Radiological Society, the Japanese Society of Interventional Radiology (Delegate), the Japanese College of Radiology (Director), Japan Society of Cardiovascular Radiology (International Committee), Japanese College of Angiology (Board of Trustees), RSNA, ESR, ISMRM, ASCI.

**Reviewer:**

Magnetic Resonance in Medical Science, Acta Radiologica, American Journal of Neuroradiology, Circulation Journal, JMRI
Abstract

Case 4: An emergency of Large vessel vasculitis

Among large vessel vasculitis (LVV), Takayasu arteritis is prevalent in Asia. Because of the non-specific clinical symptoms, LVV may be overlooked in the daily clinical practice. Although rare, untreated active LVV may result in an emergency situation. Image finding can help with suggesting the presence of LVV in such emergencies. A case with untreated LVV will be presented along with brief review of essential image findings of LVV.
**Speaker**

**Dr. Nguyen Thi Huyen**

(VNM)

Radiology Centre, Bachmai hospital, Hanoi, Vietnam

Email hoamoclanhmu@gmail.com

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**Education**

2013 - 2019: Medical student in Ha Noi Medical University, Ha Noi, Viet Nam;
Qualification: very good

**Post-Graduate Education**

2019 - now: radiology resident in Ha Noi Medical University and Radiology Centre - Bach Mai Hospital, Ha Noi, Viet Nam.

**Academic Appointments**

2019 - now: radiology resident in Ha Noi Medical University and Radiology Centre - Bach Mai Hospital, Ha Noi, Viet Nam.

**Professional Affiliations and Scientific Publications**

2021: Servelle-Martorell syndrome in an adult: A case report with findings on CT angiography

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**Abstract**

**Case 5: Acute myocardial infarction in patient with single coronary artery: a case report**

A single coronary artery (SCA) is a rare congenital anomaly. In most cases, it is an incidental finding on coronary angiography and has no clinical significance. However, it can cause angina, myocardial infarction or even sudden death. Reports of a SCA with acute myocardial infarction are very rare in medical literature. This case study examines a patient with SCA from the right aortic sinus with severe stenosis proximal and distal part of RCA was made using cardiac angiography and cardiac multidetector computed tomography (MDCT) with acute myocardial infarction.
Dr Carmen Chan was graduated from the University of Hong Kong. She is currently being the Consultant Cardiologist and the Clinical Honorary Associate Professor at Department of Medicine, Queen Mary Hospital, University of Hong Kong. She is sub-specialized in advanced non-invasive cardiac imaging and has undergone one year fellowship training at Brigham and Women’s Hospital, Harvard Medical School. Apart from providing clinical service, she is also interested and actively involved in clinical researches, guideline and reviewer in several peer group review journals and author of book chapters. She is also a council member of the Hong Kong College of Cardiology and the convener of CMR chapter and Women’s Heart Health Campaign. She is also the founding member and the international liaison officer of ASCI and the program chair of ASCI 2022 (Hong Kong).

**Abstract**

**Case 6: The role of multimodality imaging in a patient with pericardial effusion**
8:30 - 10:00 (GMT + 7)  
Educational Course 5  
**Valvular heart disease**

**Chairperson(s)**
- Prof. Truong Quang Binh (VNM)  
- Dr. Stephen Cheung (HKG)

**Speaker/Lecturers**
- Dr. Joon Won Kang (KOR)  
- Dr. Greg Kicska (USA)  
- Prof. Bernhard Gerber (BEL)  
- Dr. Weitao Ye (CHN)

8:30  **Aortic valvular disease: frequently noted**  
*Dr. Joon Won Kang (KOR)*

8:50  **Mitral valvular disease: emerging interest**  
*Dr. Greg Kicska (USA)*

9:10  **Post-operative or post-procedural valve: what should we know**  
*Prof. Bernhard Gerber (BEL)*

9:30  **Multimodality approach of infective endocarditis**  
*Dr. Weitao Ye (CHN)*
**Speaker**

**Dr. Joon Won Kang**

*(KOR)*

---

**Education**

1992-1998: Seoul National University, College of Medicine

2001-2003: Seoul National University, College of Medicine, Postgraduate course (M.S.)

2006-2013: Seoul National University, College of Medicine, Postgraduate course (Ph. D.)

**Postdoctoral Training**

1998-1999: Internship, Seoul National University Hospital

1999-2003: Residency, Seoul National University Hospital Department of Radiology

2006-2008: Fellowship, Asan Medical Center, Department of Radiology

**Major Professional Experiences**

2008-: Clinical Professor, Asan Medical Center, Department of Radiology, Cardiothoracic section

**Major Professional Societies**

Asian Society of Cardiovascular Imaging (2007-)

American Heart Association (2008-)

Society of Cardiovascular Computed Tomography (2009-)

Korean Society of Radiology (1999-)

Korean Society of Cardiology (2009-)

Korean Society of Cardiovascular Imaging (2006-)
Abstracts

Aortic valvular disease: frequently noted

Aortic valvular diseases are from congenital in origin or secondary to another disease process. One representative congenital anomaly, bicuspid aortic valve which has two cusps instead of the normal three. It is often associated with increased incidence of stenosis, regurgitation, endocarditis, and aneurysm of the aorta. Surgery is generally recommended for patients with severe stenosis or regurgitation who are symptomatic or who have significant ventricular dysfunction. Other congenital anomaly unicuspid, quadricuspid, or pentacuspid aortic valve is readily diagnosed with radiologic methods. For tricuspid aortic valve stenosis (AS), transcatheter aortic valve replacement (TAVR) is an emerging therapeutic option not only patients for who are not eligible for surgical treatment but also for low-risk patients. Computed tomography (CT) is an essential component of preoperative planning for TAVR; it is used to determine the aortic root dimensions, severity of peripheral vascular disease, and status of the coronary arteries. MRI also provide qualitative and quantitative information of presence of systolic jets, flow velocity, and other flow dynamics. Aortic regurgitation (AR), which is caused by incompetent closure of the aortic valve, CT and MRI can provide valvular morphologic parameters; qualitative assessment of dephasing jets at Doppler ultrasonography; or measurements of the regurgitant fraction, volume, and orifice area. Mild regurgitation is managed conservatively, whereas severe or symptomatic regurgitation usually leads to valve replacement surgery, especially in the presence of substantial left ventricular enlargement or dysfunction. Bacterial endocarditis, although less common than aortic stenosis and regurgitation, is associated with substantial morbidity and mortality. Electrocardiographically gated CT reliably demonstrates infectious vegetations, aortic root pathology such aneurysm, abscess, and soft tissue inflammation.
Speaker

Dr. Greg Kicska

(USA)

Abstracts

Mitral valvular disease: emerging interest
Speaker

Prof. Bernhard Gerber

(BEL)

Professeur Ordinaire Clinique, Faculté de Médecine, UCLouvain, Brussels Belgium
Chef de Clinique, Service de Cardiologie, Cliniques Universitaires St. Luc, UCLouvain, Brussels, Belgium
Chef de Pole, Unit CARD, Institut de recherche expérimentale et Clinique (IREC)
2020-2021 Vice President and Chair of cMR Section EACVI (European Association for Cardiovascular Imaging.
President Elect, Belgian Society of Cardiology (BSC) (starting 2022).

Abstracts

Post-operative or post-procedural valve: what should we know
Speaker

Dr. Weitao Ye
(CHN)
Guangdong Provincial People’s Hospital, Guangdong Academy of Medical Sciences, Guangzhou, Guangdong, P. R. China
Email wuchuanywt@qq.com

Publications

Abstract
Multimodality approach of infective endocarditis

Coronary artery disease (CAD) remains a leading cause of mortality around the world and produces immense health and economic burdens globally. Comprehensive evaluation of CAD includes morphological and functional assessment. Coronary computed tomography angiography (CCTA) has been established as one of the first morphological evaluation technology choices for excluding obstructive CAD with high sensitivity and negative predictive value. However, such diagnoses are limited to the anatomical level and have tendency to overestimate the degree of stenosis. Direct revascularization based on vascular stenosis is not applicable to all CAD patients, as morphological and functional abnormalities do not exactly match. Myocardial perfusion Imaging (MPI) has been developed as an effective method for assessing the myocardial ischemia situation caused by CAD. With the continuous development of CT technology, comprehensive assessment of CAD by using cardiac CT has become feasible. Myocardial CT perfusion imaging (CTP) has exhibited great advantages and incremental value over coronary CTA, providing functional evaluation of CAD. The advantages of CTP include high spatial resolution, absolute quantitative analysis, and providing “One-stop” cardiac CT examination. This topic presentation will introduce our preliminary clinical experience, mainly including quantitative parameter evaluation and low dose “one-stop-shop” CTP examination, and further provide literature review of the CTP current progress and further Expectation, which consists of feasibility verification, diagnostic performance, clinical strategy optimization and prognosis evaluation of CTP. In addition, the CTP expert consensus and cost-effectiveness analysis will also be briefly introduced.
DAY 3 – AUGUST 21 (SATURDAY) / CHANNEL 1

10:30 - 12:00 (GMT + 7)

ASCI meets NASCI
Safety in Cardiovascular Imaging

Chairperson(s)

A/Prof. Bui Van Giang (VNM)
Dr. Greg Kicska (USA)

Speaker/Lecturers

Dr. Karen Ordovas (USA)
Prof. Whal Lee (KOR)
Dr. Greg Kicska (USA)
Dr. Stephen Cheung (HKG)

10:30     Patients with Pacemakers/ICDs: is this safe for CMR
Dr. Karen Ordovas (USA)

10:50     CT contrast safety
Prof. Whal Lee (KOR)

11:10     CT radiation safety: common questions
Dr. Greg Kicska (USA)

11:30     Medications in cardiac imaging
Dr. Stephen Cheung (HKG)
Speaker

Dr. Karen Ordovas

(USA)

MD, MAS is a Professor of Radiology, Section Chief of Cardiothoracic Imaging at the University of Washington.

She specializes in advanced Cardiac and Pulmonary Imaging, in particular cardiovascular MR and CT. She received her medical degree from Universidade Federal do Rio Grande do Sul, Brazil, and completed her residency in Radiology at the Instituto de Cardiologia do Rio Grande do Sul and Mae de Deus Hospital, Brazil. She has completed research and clinical fellowships in CardioThoracic Radiology at the University of California San Francisco (UCSF), and earned a Masters Degree in clinical research from the Department of Epidemiology and Biostatistics at UCSF.

She is a fellow of the Society of Cardiovascular MRI (SCMR), American Heart Association, and North American Society for Cardiovascular Imaging (NASCI).

In addition to serving at the SCMR Executive Board as Treasurer, Dr. Ordovas is deeply engaged in the main radiology and cardiology societies on her field. She is past-president of NASCI, Chair of the American College of Radiology Cardiology Research Committee, and Co-Chair of the RSNA cardiac program subcommittee. Dr. Ordovas’ research interests include establishing evidence-based applications for CMR and CCT in several clinical settings, with emphasis on non-ischemic cardiomyopathies, women cardiovascular diseases, and adults with congenital heart disease.

Dr. Ordovas has more than 100 peer-reviewed articles and 26 book chapters. Her articles have appeared in the Radiology journal, the American Journal of Cardiology, the JACC Cardiovascular Journal, and Stroke: A Journal of Cerebral Circulation.

Abstract

Patients with Pacemakers/ICDs: is this safe for CMR

In this lecture, we will review MRI safety issues related to imaging patients with pacemaker and ICDs, including MRI safe and MRI conditional devices. We will also review practical safety protocols that can be implemented to ensure a CMR program is successful in patients with these devices. Finally, we will discuss novel CMR techniques for diminishing artifacts when imaging these patients and we will review the most common CMR indications for patients with Pacemaker/ICD.
**Speaker**

**Prof. Whal Lee**

(KOR)
Department of Radiology
Seoul National University Hospital

Email whal.lee@gmail.com

**Prof. Whal Lee Bio**

Prof. Whal Lee graduated with a medical degree from the Seoul National University and got the master degree and PhD degree in the same university. He completed his fellowship and instructor trainings at the Seoul National University Hospital in Korea and Hospital for Sick Children in Canada and is a Professor in Department of Radiology, Seoul National University Hospital and Seoul National University College of Medicine. Prof. Lee is an active member of a number of professional societies including the Korean Society of Radiology, Korean Society of Cardiovascular Imaging, Asian Society of Cardiovascular Imaging, Korean Society of Ultrasound Medicine, Bioengineering society for circulatory disorders, Korean Society of Circulation and Korean Society of Magnetic Resonance in Medicine. During the course of his career, he has published 14 book chapters and 140 SCI/SCIE articles related to radiology and imaging. He is one of editors of Acta Radiologica and an editor in chief of Investigative Magnetic Resonance Imaging. Moreover, he is an assistant secretary general of presidential office and a director of Speaker Bureau of Asian Society of Cardiovascular Imaging. He is also an international liaison director of Korean Society of Radiology and office director of Asian-Oceania Society of Radiology. Prof. Lee is currently a member of DUR committee of Korea Institute of Drug Safety and Risk Management and a secretary general of Asian Society of Magnetic Resonance in Medicine.

**Abstract**

CT contrast safety
Abstract

CT radiation safety: common questions
Speaker

Dr. Stephen Cheung
(HKG)
Department of Radiology, Queen Mary Hospital, Pokfulam Road, Hong Kong SAR, China
Email cheungcws@gmail.com, cheungcw@ha.org.hk

Professional Qualifications and Awards:

July 1992   MBBS (HK)
April 1995   MRCP (UK)
September 1997   FRCR Part I, awarded Frank Doyle Medal by Royal College of Radiologists, UK
October 2000   FRCR Part II, awarded Rohand Williams Medal by Royal College of Radiologists, UK
January 2003   Fellow of Hong Kong College of Radiologists
May 2003      Fellow of Hong Kong Academy of Medicine (Radiology)
October 2014   European Diploma in Cardiac Radiology, European Society of Cardiac Radiology
March 2015     Cardiac MR Level 3 Certification, EACVI, European Society of Cardiology

Present Positions:
Hospital Authority:
Consultant, Head of Cardiovascular Imaging, Department of Radiology, Queen Mary Hospital
Chairman of Quality Assurance and Safety Subcommittee, Coordinating Committee in Radiology, Hospital Authority
Co-Chairman of Working Group on Collaboration of Cardiac and Radiological Services, Coordinating Committee in Radiology and Central Committee in Cardiac Service, Hospital Authority

University of Hong Kong:
Honorary Associate Clinical Professor, Department of Diagnostic Radiology, Faculty of Medicine, University of Hong Kong
Hong Kong College of Radiologists:
Chairman of Examination Board
Chairman of CME/CPD Subcommittee
Chairman of Education and Research Fund Committee

Local and International Radiology and Medical Societies:
Member of Editorial Board, Cardiovascular Imaging Asia
Council Member of Ho Hung-Chiu Medical Education Foundation
Member of CMR Chapter, Hong Kong College of Cardiology
Member of Executive Committee, Asian Society of Cardiovascular Imaging (ASCI)
International Liaison Officer of Administrative Office, ASCI
Member of International Outreach Committee & Program Committee, SCMR

Positions held after internship:
July 1993 to June 1996: Medical officer, Department of Cardiac Medicine, The Grantham Hospital and Department of Medicine, Queen Mary Hospital
July to November 1996: Medical Officer, Department of Accident and Emergency Medicine, Queen Elizabeth Hospital
December 1996 till November 2003: Medical Officer, Department of Radiology, Queen Mary Hospital
February to August 2004: Visiting Fellow, Division of Cardiovascular Imaging, Department of Radiology, Stanford University Medical Center, USA
December 2003 to October 2007: Associate Consultant, Department of Radiology, Queen Mary Hospital
February to April 2010: Visiting Physician, Division of Neuro-radiology and Cardiovascular Imaging, Department of Radiology, Brigham and Women’s Hospital, Boston, USA

Publications:


Abstract

Medications in cardiac imaging
DAY 3 – AUGUST 21 (SATURDAY) / CHANNEL 2

10:30 - 12:00 (GMT + 7)

**Update lecture 3**
*Aortic Disease: Team Approach*

**Chairperson(s)**
- Prof. Huynh Van Minh (VNM)
- Prof. Ming-Ting Wu (TWN)

**Speaker/Lecturers**
- Prof. Ming-Ting Wu (TWN)
- Prof. Nguyen Hoang Dinh (VNM)
- Dr. Nguyen Tung Son (VNM)
- A/Prof. Dong Hyun Yang (KOR)

**10:30**  
CT of the aorta: Interpretation and pitfalls  
*Prof. Ming-Ting Wu (TWN)*

**10:50**  
New trends in surgical decision making and techniques  
*Prof. Nguyen Hoang Dinh (VNM)*

**11:10**  
Perspective: aortic intervention  
*Dr. Nguyen Tung Son (VNM)*

**11:30**  
4D flow imaging of aorta: is it promising?  
*A/Prof. Dong Hyun Yang (KOR)*
Speaker

Prof. Ming Ting Wu

(TWN)

Department of Radiology  
National Yang Ming Chiao Tong University  
Kaohsiung Veterans General Hospital

Email  Wu.mingting@gmail.com

Specialty

Cardiothoracic radiology

Education

1979-1984  National Yang-Ming Medical College. MB

Post-Graduate Education

1995-1996  Research fellow, NMR-Center, Massachusetts General Hospital, Boston, Supervisors: Kenneth K. Kwong, & Bruce R. Rosen

1990-1992  Resident and Chief Resident, Dept. of Radiology, Kaohsiung VGH

Academic Appointments

2008-present  Professor of Radiology, National Yang Ming Chiao Tung University

Professional Affiliations and Scientific Publications


Abstract

CT of the aorta: Interpretation and pitfalls
Speaker

Prof. Nguyen Hoang Dinh
(VNM)
Cardiovascular Surgery Department
University Medical Center
Faculty of Medicine
University of Medicine and Pharmacy
Email  dinh.nh@umc.edu.vn

Education
High School, 1984-1987
Le Hong Phong High School
Ho Chi Minh City, Vietnam
Medical School, 1987-1993
University of Medicine and Pharmacy
Ho Chi Minh City, Vietnam
Doctor of Medicine

Post graduate medical training and professional activities
1994-1997: Residency, General Surgery
Cho Ray Hospital
Ho Chi Minh City, Vietnam
1997-2000: Master of Science Research
University of Medicine and Pharmacy
Ho Chi Minh City, Vietnam
1998-1999: Fellowship, Transplantation Surgery
Hautepierre Hospital
Louis Pasteur University
Strassbourg, France
2002-2004: Fellowship, Cardiothoracic Surgery
Bichat Hospital
Pierre et Marie Curie Paris 6 University Paris, France
2004-2006: Cardiothoracic surgeon
Cho Ray Hospital
Ho Chi Minh City, Vietnam
2006 – current: Head of Cardiovascular Surgery Department
Chief Surgeon, University Medical Center
Vice-head of Cardiothoracic and Vascular Department, Faculty of
Medicine, University of Medicine and Pharmacy, Ho Chi Minh City, Vietnam

2005-2011: Doctor of Philosophy (Cardiothoracic)
University of Medicine and Pharmacy
Ho Chi Minh City, Vietnam

2012 – current: Vice-director
Heart Center of UMC, Ho Chi Minh City

2016 – current: Associate Professor in Cardiothoracic and Vascular Surgery
Faculty of Medicine
University of Medicine and Pharmacy, Ho Chi Minh City

**Academic role**
- European Society of Cardiology (Work group member)
- Vietnam Association of Cardiothoracic Surgeons (Board, Vice-secretary general)
- Vietnam Heart Association (Board)
- Pediatric Cardiology and Pediatric Intervention Association of Ho Chi Minh City (Vice-chairman)
- Association of Cardiothoracic and Vascular Surgeons of Ho Chi Minh City (Board)

**Publications**


**Abstract**

New trends in surgical decision making and techniques
Speaker

Dr. Nguyen Tung Son
(VNM)
Consultant Physician,
Cardiovascular and Thoracic Center and International Relations Department
E-mail: nguyentungsonhmu@gmail.com

Specialty
Cardiovascular Interventionist

Memberships and associations
Member of Vietnam Cardiovascular Surgery Association.
Member of Vietnam Cardiovascular Association.
Member of Aortic Association.

Abstract
Perspective: aortic intervention
Speaker

A/Prof. Dong Hyun Yang  
(KOR)

Associate professor of Radiology,  
Director of Cardiovascular Imaging Center, Heart 
Institute,  
Asan Medical Center, University of Ulsan College of 
Medicine, Seoul, Korea  
Director (M.D.) of Medical Imaging and Intelligent 
Reality Lab

Email  donghyun.yang@gmail.com

Education and post-graduate training

1. Education

1994.03 - 2000.02  M.D. (License #70559)  
Pusan National University, School of Medicine, Pusan, Korea
2002.03 - 2004.02  M.S.  
University of Ulsan, College of Medicine, Seoul, Korea
2008.03 - 2013.02  Ph.D.  
University of Ulsan, College of Medicine, Seoul, Korea
2015.08 - 2016.07  Visiting Scholar, Dalio Institute of Cardiovascular Center, New York  
-Presbyterian Hospital and the Weill Cornell Medical College, New York, NY

2. Post-graduate training

2000.03 - 2005.02  Internship & Residencyship in Radiology Asan Medical Center, Seoul, Korea
2005.03 - 2008.04  Military Service as a doctor  
Aerospace Medical Center, Chungju, Chungbuk, Korea
2008.05 - 2009.02  Fellowship of pediatric radiology  
Asan Medical Center, Seoul, Korea
2009.03 - 2011.02  Radiologist in private clinic  
Dongyang Radiology Clinic, Daejeon, Korea
2011.03 - 2012.03  Fellowship of cardiovascular radiology  
Asan Medical Center, Seoul, Korea
2012.03 - 2017.02  Assistant professor of Radiology  
Asan Medical Center, Seoul, Korea
2017.02 - current  Associate professor of Radiology,  
Director of Cardiovascular Imaging Center, Heart Institute, Asan Medical Center,  
University of Ulsan College of Medicine, Seoul, Korea

Publications


Abstract

4D flow imaging of aorta: is it promising?
DAY 3 – AUGUST 21 (SATURDAY) / CHANNEL 3

10:30 - 12:00 (GMT + 7)

**Refresh course 3**

*Acute chest pain in the ER*

**Chairperson(s)**

- Dr. Bin Lu (CHN)
- Dr. Ki Seok Choo (KOR)

**Speaker/Lecturers**

- Dr. Gary Liew (AUS)
- Dr. Bin Lu (CHN)
- Dr. Lynette Teo (SGP)
- Dr. Wen-Jeng Lee (TWN)

10:30   **Clinical scenario with imaging application**  
         *Dr. Gary Liew (AUS)*

10:50   **Cardiac CT: the evidence**  
         *Dr. Bin Lu (CHN)*

11:10   **CMR in acute chest pain**  
         *Dr. Lynette Teo (SGP)*

11:30   **Triple rule-out: is it still useful**  
         *Dr. Wen-Jeng Lee (TWN)*
Dr. Gary Liew  
(AUS)  
MBBS, PhD, FRACP, FCSANZ  
U.S. Board Certified Cardiovascular CT (CBCCT)

Dr Liew is an interventional cardiologist at Epworth Healthcare, Melbourne, Australia and Director of Cardiac CT, Imaging Associates. He is a Senior Fellow of the University of Melbourne where he teaches medical students.

He is a graduate of the University of Melbourne and completed his general cardiology training at the Royal Melbourne Hospital. He undertook a PhD at the University of Adelaide in the area of atherosclerotic plaque imaging and was a fellow in Cardiac CT & MRI for 3 years. Subsequently, he undertook a 2-year interventional fellowship at the Royal Adelaide Hospital in complex coronary interventions.

In 2009, Dr Liew was appointed as the Cardiologist-In-Charge of the Cardiac CT service, Royal Adelaide Hospital. In 2011-12, he undertook a post-doctoral fellowship in coronary plaque imaging at Massachusetts General Hospital & Harvard Medical School in Boston, USA.

Dr Liew is US Board Certified in Cardiovascular CT and a founding member of the Society of Cardiovascular CT. He is the lead author of the current Australian guidelines on Coronary CT and MRI. He is also the lead author of the Cardiac Society Position Statement on Calcium Scoring.

Abstract

Clinical scenario with imaging application

Acute chest pain presentations in Emergency Departments are potential life-threatening emergencies which require rapid assessment and diagnosis. Imaging has an increasing role in our diagnostic pathways. This talk will cover the common aetiologies of chest pain including acute coronary syndromes, aorta and respiratory pathologies. We will review the current research and guidelines on use of various modalities such as CT, ultrasound / echocardiography, nuclear imaging and MRI.
Speaker

Dr. Bin Lu

(CHN)

Department of Radiology, Fuwai Hospital, Chinese Academy of Medical Sciences and Peking Union Medical College

1. M. D., Professor and Director of the Radiologic Imaging Department, Fuwai Hospital, Chinese Academy of Medical Sciences and Peking Union Medical College
2. The Chairman of China International Regional Committee of Society of Cardiovascular Computed Tomography (SCCT)
3. The Vice-chairman and President-Elect of Asian Society of Cardiovascular Imaging (ASCI)

Bin Lu, M.D., is now the director and professor of the Department of Radiologic Imaging, Fuwai hospital, National Center for Cardiovascular Diseases, and the affiliated teaching hospital of Chinese Academy of Medical Sciences and Peking Union Medical College. He has been one of the Board-of-directors of the Society of Cardiovascular Computed Tomography (SCCT), and the Chair of China International Regional Committee of SCCT. He is currently the Vice-president and President-elect of Asian Society of Cardiovascular Imaging (ASCI), as well as the member of executive committee of ASCI. He is one of the Vice-chairman of Beijing Society of Radiology. He is the member of the Cardiac-Thoracic imaging sub-committee of the Chinese Society of Radiology (CSR).

Dr. Lu had been studied in the school of medicine, Tsing-Tao University in Shan-dong province China since 1986. From 1993 to 1998, he was the post-graduate fellow of the department of radiology, Fuwai hospital, which was the affiliated and teaching hospital of Peking Union Medical College and Chinese Academy of Medical Sciences in Beijing. In 1998, he got the doctoral degree of medicine in Peking Union Medical College, as well as finished the fellow-ship training of Radiology. From 1998 to 2001, he had been working in Harbor Medical Center of University of California in Los Angeles (UCLA) as a visiting scholar. In 2002, he promoted to be the associate professor of Radiology in Fuwai hospital. In 2007, he was promoted to be the professor of the Department of Radiology in Fuwai hospital and up to now. Dr. Lu, as the chief radiologist in Fuwai hospital, which is the biggest and most famous cardiovascular specific hospital in China, he and his team perform more than 200 coronary CTA per day, not including
other CTA scans, such as pulmonary CTA, Aortic and peripheral CTA, and structural cardiac diseases, as well as congenital heart diseases.

The major research field of Dr. Lu is cardiovascular imaging, especially on CT imaging. A total of more than 100 peer-reviewed scientific English papers had been published on international journals, as well as more than 100 paper published on Chinese Journals. As a Principal Investigator (PI), he had been charging on more than 14 research projects which were sponsored by Chinese government. He involved in some international multicenter studies, such as MESA study, CREDECE study. He had obtained six scientific research awards by the ministry of public health of china and other scientific and professional organizations. He is the winner of “gold medal” on cardiovascular research by ASCI in 2017.

He is now the reviewer of 14 Scientific Journals, including 8 of SCI English Journals. He published 3 books on cardiovascular imaging, and more than 10 chapters of other books. He organized and chaired many times of international meetings, such as SCCT CHINA-IRC annual meetings and China Heart Congress (CHC), as well as the 12th Annual meeting of ASCI. Dr. Lu trained more than 20 fellowships or post-doc visiting fellows of Cardiac Radiologists.
Abstract

Cardiac CT: the Evidence

The efficient and reliable evaluation of patients with acute chest pain is one of the most challenging tasks in the emergency room (ER). In this session, we will discuss the role of CT in low to intermediate risk patients with suspicion of acute coronary syndrome (ACS), aortic diseases and pulmonary embolism (PE).

1. Cardiac CT may be the most valuable for low to intermediate-risk patients with non-conclusive troponins and ECG results, or in a semi-elective setting after an ACS has been ruled out by negative biomarkers.

1.1 Several randomized trials have established early cardiac CT as a viable safe and potentially more efficient alternative to functional testing in the evaluation of acute chest pain.

1.2 Ongoing investigations explore whether advanced anatomic and functional assessments such as high-risk coronary plaque, resting myocardial perfusion, and left ventricular function, or the simulation of the fractional coronary flow reserve will add information to the anatomic assessment for stenosis, which would allow expanding the benefits of cardiac CT from triage to treatment decisions.

1.3 Especially, the combination of high-sensitive troponins and coronary computed tomography angiography may play a valuable role in future strategies for the management of patients presenting with acute chest pain.

2. Computed tomography plays a central role in the diagnosis, risk stratification, and management of acute aortic syndrome. Its advantages over other imaging modalities include the short time required for image acquisition and processing, the ability to obtain a complete 3D dataset of the entire aorta, and its widespread availability.

3. Multi-detector CT pulmonary angiography (CTPA) is the method of choice for imaging the pulmonary vasculature in patients with suspected PE. It allows adequate visualization of the pulmonary arteries down to the sub-segmental level. It is ensured that they are capable of safely excluding PE in contemporary patient populations with a rather low pre-test probability of the disease. Conversely, a positive test should have an adequate specificity to set the indication for anticoagulant treatment.

In conclusion, CT is now the key imaging method for both diagnosing and risk stratification on acute chest pain patients in emergency department.
BIOSKETCH

Lynette is a radiologist at the National University Hospital, Singapore. She did her radiology training in Singapore with fellowships in cardiothoracic imaging at the Royal Brompton Hospital, United Kingdom in 2006/7 and 2011. She has been an EXCO member with the Asian Society of Cardiovascular Imaging (ASCI) since 2014. She has also served as ACGME-I radiology program director for more than 10 years and continues to be involved in undergraduate and postgraduate education; sitting on various radiology and educational-related committees. She is also involved in several cardiac-related research projects.

Abstract

CMR in acute chest pain

Acute chest pain is common in the emergency room. If the patient has the typical symptoms, ECG and increased serum cardiac biomarker levels for acute coronary syndrome, a coronary angiogram is typically performed to rule out obstructing coronary artery disease. Acute chest pain with non-obstructed coronary arteries can have other cardiac causes like myocardial infarction with non-obstructed coronary arteries (MINOCA), myocarditis and Takotsubo and CMR (cardiovascular magnetic resonance scan) can help to differentiate between these conditions. CMR sequences like T2W STIR (short tau inversion recovery sequence) and early and late gadolinium enhancement inversion recovery sequences are typically used. Newer native T1 mapping, ECV (extracellular volume) and T2 mapping sequences have also been shown to further help in the differential diagnosis of patients with acute chest pain. Also, cardiac MRI is excellent for evaluation of patients with suspected complications post-acute myocardial infarction eg. microvascular obstruction, intramyocardial haemorrhage or adverse left ventricular remodeling. CMR should be performed early in the course of the disease (<2 weeks after onset of symptoms).
Speaker

Dr. Wen-Jeng Lee (TWN)

Vice Director, Department of Medical Imaging, National Taiwan University Hospital
Adjunct Assistant Professor, Department of Radiology, National Taiwan University
Secretary-General, Taiwan Radiological Society, TRS (The Radiological Society of the Republic of China, RSROC)

Email wenjeng@gmail.com

Medical Education:
School of Medicine, National Taiwan University, 1986-1995
Degree: M.D

Postgraduate Education:
Resident (Nuclear Medicine), Taipei Municipal Jen-Ai Hospital, 1995-1996
Resident (Radiology), National Taiwan University Hospital, 1996-2001
PhD, Department of Electrical Engineering, National Taiwan University, 2003-2012

Certification:
Board of the Radiological Society of the Republic of China, 2000

Professional Experience:
Assistant Professor, Department of Radiology, College of Medicine, National Taiwan University, 2008-present
Lecturer, Department of Radiology, College of Medicine, National Taiwan University, 2004-2008
Staff Radiologist, Department of Medical Imaging, National Taiwan University Hospital, 2001-Present
Director, Department of Medical Imaging, National Taiwan University Hospital Hsin-Chu Branch, 2015-2018
Vice director, Department of Medical imaging, National Taiwan University Hospital, 2020-present

Professional Activities:
Deputy Secretary General, Taiwan Radiological Society, TRS (The Radiological Society of
Asian Society of Cardiovascular Imaging (ASCI 2021)

Abstract

Triple rule out: is it still useful

Triple-rule-out (TRO) computed tomographic (CT) angiography is used in clinical practice for the evaluation of the coronary arteries, aorta, pulmonary arteries, and adjacent intrathoracic structures for the patient with acute chest pain. The goal of TRO CT is to safely exclude coronary artery disease and find an alternative diagnosis. The ability to detect non-coronary lesions in one single study is a major advantage over other diagnostic tests.

In this presentation, the TRO protocol, the clinical role of TRO CT and the diagnostic yield of TRO CT will be reviewed.
DAY 3 – AUGUST 21 (SATURDAY) / CHANNEL 1

14:00 - 15:30 (GMT + 7)

Special focus 3
Patients with Stable Chest Pain: Debate Session

Chairperson(s)
Prof. Le Ngoc Ha (VNM)
Prof. Hwan Seok Yong (KOR)

Speaker/Lecturers
Prof. Le Ngoc Ha (VNM)
Prof. Koen Nieman (USA)
Dr. Kakuya Kitagawa (JPN)
Prof. James Moon (GBR)

14:00  More evidence: SPECT is the best
       Prof. Le Ngoc Ha (VNM)

14:20  CT-FFR is better
       Prof. Koen Nieman (USA)

14:40  CT-Perfusion is better
       Dr. Kakuya Kitagawa (JPN)

15:00  Stress CMR is better
       Prof. James Moon (GBR)
Speaker

Prof. Le Ngoc Ha
(VNM)

Abstract

More evidence: SPECT is the best
Personal Statement

My research focused on development and validation of advanced cardiac imaging technology and optimization of diagnostic strategies for the management of cardiovascular disease. As a PhD graduate student, I took advantage of the technical potential of the first multislice spiral CT systems to noninvasively image the coronary arteries, which resulted in several highly cited publications. After my cardiology training, which included an imaging fellowship at the Massachusetts General Hospital (Harvard Medical School), I eventually succeeded my mentor as director of advanced CV imaging research, a successful collaboration between the departments of Cardiology and Radiology at the Erasmus University. As part of an internationally recognized cardiac imaging group, I was able to initiate and lead several multicenter, randomized controlled trials to investigate the clinical value of cardiac CT in patients with stable angina (CRESCENT; CRESCENT 2) and acute chest pain in the emergency room (BEACON), as well as randomized trials to compare scanner technology and contrast enhancement protocols (CT-CON, IsoCOR). In 2013 I received funding from ZonMw (Dutch equivalent of NIH) to perform the CRESCENT 2 trial. As coordinator of the cardiac CT corelab at Cardialysis Inc. at Cardialysis (CRO) I supervised the performance and evaluation of cardiac CT for several international trials including ABSORB (bioresorbable coronary scaffolds) and ADVANCE (TAVR). In 2014, I received the established clinical investigator award from the Dutch Heart Foundation, to support my research on functional applications for cardiac CT. We studied the value of dynamic myocardial perfusion CT as well as CT-based fractional flow in pre-clinical and clinical studies, in collaboration with the Biomedical Informatics and Biomedical Engineering departments at Erasmus MC. In 2016, I relocated to California, to continue my cardiovascular imaging research at Stanford University, with a specific interest in diagnostic innovations at the interface of medicine and computer science. I lead the SPECIFIC trial: an international validation study of CT myocardial perfusion imaging, as well as an international consortium to investigate the performance of an onsite performed
CT-fractional flow reserve application developed through machine-learning (MACHINE consortium). I also serve as co-PI for the HeartFlow ADVANCE registry to study the clinical implementation of CT-FFR using an application based on computational fluid dynamics. In 2017, I am on the executive board of the Society of Cardiovascular CT as president-elect, and serve on the editorial board of JACC CV Imaging.

**Positions and Honors**

**Positions and Employment**

<table>
<thead>
<tr>
<th>Year</th>
<th>Position</th>
</tr>
</thead>
<tbody>
<tr>
<td>2000-2003</td>
<td>PhD graduate student cardiac imaging, Erasmus University Medical Center.</td>
</tr>
<tr>
<td>2003-2004</td>
<td>Internal Medicine Residence, Havenziekenhuis/Erasmus Medical Center, Rotterdam, NL</td>
</tr>
<tr>
<td>2004-2005</td>
<td>Cardiovascular Imaging Fellowship, Harvard University, Massachusetts General Hospital, Boston, MA</td>
</tr>
<tr>
<td>2005-2008</td>
<td>Cardiology Fellowship, Erasmus University Medical Center, Rotterdam, NL</td>
</tr>
<tr>
<td>2008-2011</td>
<td>University Medical Specialist, Cardiology, Erasmus University Medical Center, Rotterdam, NL</td>
</tr>
<tr>
<td>2011-2013</td>
<td>Assistant Professor Cardiology / Radiology, Erasmus University Medical Center, Rotterdam, NL</td>
</tr>
<tr>
<td>2012-2014</td>
<td>Medical Coordinator intensive cardiac care unit, Erasmus Medical Center, Rotterdam, NL</td>
</tr>
<tr>
<td>2013-2016</td>
<td>Associate Professor Cardiology and Radiology, Erasmus Medical Center, Rotterdam, NL</td>
</tr>
<tr>
<td>2016-</td>
<td>Honorary Associate Professor Cardiology / Radiology, Erasmus Medical Center, Rotterdam, NL</td>
</tr>
<tr>
<td>2016-</td>
<td>Associate Professor Medicine (Cardiology) and Radiology, Stanford University, CA</td>
</tr>
</tbody>
</table>

**Other Experience and Professional Memberships**

<table>
<thead>
<tr>
<th>Year</th>
<th>Experience</th>
</tr>
</thead>
<tbody>
<tr>
<td>2006-2016</td>
<td>Clinical coordinator, Cardiac CT Corelab, Cardialysis, Rotterdam, NL</td>
</tr>
<tr>
<td>2008-2010</td>
<td>Section editor CT, Reviews in Cardiovascular Imaging</td>
</tr>
<tr>
<td>2009-2015</td>
<td>Member, secretary, chair (2012-15), NVVC WG Cardiac CT, MRI and Nuclear Imaging</td>
</tr>
<tr>
<td>2009-2016</td>
<td>Board, program committee, Dutch Institute for Cardiovascular Education (CVOI)</td>
</tr>
<tr>
<td>2010-2016</td>
<td>Nucleus member, secretary, (ESC) EACVI section cardiac CT and nuclear imaging</td>
</tr>
<tr>
<td>2013-2016</td>
<td>Board member, Netherlands Vascular Forum (formerly NVVG)</td>
</tr>
<tr>
<td>2013-</td>
<td>Visiting professor, cardiac imaging, Svendborg Hospital, Odense</td>
</tr>
</tbody>
</table>
University, DK
2014- Program committee Annual Scientific Meeting (currently chair), Society of Cardiovascular CT
2015- Board member (currently president-elect), Society of Cardiovascular CT
2015-2018 Associate editor, Journal of Cardiovascular CT
2017- Associate editor, JACC cardiovascular imaging

Honors & awards
1998 Japan Prizewinners Program, Dutch Ministry of Education.
2003 PhD cum laude.
2004 Stipend for fellowship at Massachusetts General Hospital, ICIN.
2008 Erasmus MC Fellowship [grant for research on cardiac CT in the ED]
2009 ESC Fellowship, European Society of Cardiology
2009 Paludanus award (for best clinical innovations) for the fast-track chest pain clinic, Unive.
2014 Established Clinical Investigator award, Dutch Heart Foundation.

Contributions to Science

1. Pioneered use of coronary CT angiography. In the earlier 2000s we were the first to demonstrate the ability of multislice spiral CT angiography to detect obstructive CAD. Subsequent studies focused on optimization and clinical application of CT angiography, leading to several multicenter trials, which established how coronary CT angiography is used in cardiovascular medicine today.

2. Demonstrated the clinical value of cardiac CT. As CT angiography technologically matured, the next step was to establish its clinical and economic value techniques in different clinical scenarios. Based on analysis of registry data and cost-effectiveness analyses, we designed diagnostic algorithms for optimized effectiveness and efficiency, and subsequently performed three multicenter, randomized clinical effectiveness trials. CRESCENT 1 (PI: Nieman) demonstrated that in patients with stable CAD, CT angiography could improve clinical outcome at lower cost compared to standard care. BEACON (PI: Nieman) demonstrated that in patients with acute chest pain CTA was
safe and cost-effective, but could not as earlier reported shorten observation times after the introduction of high-sensitivity troponins. CRESCENT 2 (PI: Nieman) shows that a tiered, cardiac CT protocol, including myocardial perfusion imaging, was time-efficient and provided comprehensive information for subsequent management in patients with stable chest pain. These studies substantially contributed to the evidence base for clinical

Abstract

CT-FFR is better

Using computational fluid dynamics the hemodynamic impact of coronary stenoses can be simulated from standard coronary CT angiograms. CT-based fractional flow reserve shows good correlation with invasive FFR, has incremental value for the identification of hemodynamic significant coronary disease by CCTA, and can reduce rates of invasive angiograms without actionable coronary artery disease. There are however consideration that affect the accuracy and performance of the technology worth considering. But in appropriately selected patients CT-FFR has the advantage of providing valuable information without the need for further testing.
**Speaker**

**Dr. Kakuya Kitagawa**

(JPN)

Professor Department of Advanced Diagnostic Imaging, Mie University Graduate School of Medicine
Program Director, ASCI Joint Symposium by ASCI school of Asian Society of Cardiovascular Imaging
Board Certification: Japanese College of Radiology
Japanese Society of Nuclear Medicine

email  kakuya@med.mie-u.ac.jp

**Abstract**

**CT-Perfusion is better**

The evaluation of myocardial ischemia is essential in determining the treatment strategy for coronary artery disease. Currently, SPECT is the most widely used imaging modality for myocardial perfusion. However, meta-analyses have shown that MRI is superior to SPECT in the diagnosis of ischemia, and there is evidence that MRI is superior in terms of risk stratification as well. On the other hand, there are some points that need to be overcome in MRI, such as the fact that spatial coverage is limited to a few slices, that it is difficult to align coronary artery information obtained by CT, and that diagnosis of ischemia is basically done visually and is not necessarily highly objective.

In recent years, dynamic CT perfusion imaging has emerged to assess myocardial blood flow; CT covers the entire left ventricular myocardium and can be easily fused with coronary CT, and fully-quantitative analysis allows objective assessment. In addition, unlike CT-FFR, CT perfusion is not a computer simulation, but an evaluation of what is actually happening in vivo with unprecedented spatial resolution, which will contribute to a better understanding of myocardial pathophysiology. In this talk, I would like to introduce the latest progress in myocardial perfusion evaluation by CT and clarify the usefulness and advantages of perfusion CT.
Speaker

Prof. James Moon

(GBG)
Professor of Cardiology, UCL/UCLH/Barts
Clinical Lead CMR, Barts Heart Centre

Email James@moonmail.co.uk

Education / Qualifications

2020 Web of Science Highly Cited Researcher
2018 FRCP
2005 MD (London), MRCP
1995 MB BCh, Christ Church, Oxford University
1992 BA, St Catharine’s, Cambridge University

Other Posts: Former clinical director, imaging Barts Heart Centre
Past president, British Society of CMR.
Medical Director, Chenies Mews Imaging Centre
Founder/prior Chair: International T1 mapping working group
Editorial Board: Circulation, Nature Scientific Reports, JCMR
Program Chair EuroCMR 2017; BSCMR 2012.
BHF fellowship committee 2021

Publications:

Web of Science Highly Cited Researcher. 392 Pubmed papers; H-index 76, citations 32,800. Fellows have won around 20 Young Investigator Awards (eg BCS, ESC, BSCMR, SCMR)

Research goals: To understand the heart and use this to improve outcomes via better diagnoses and therapies. My group develops new tests and measurement techniques linking technical development to human variation (health, rare and common diseases) from idea to global delivery. Examples include LGE, T1, T2, ECV mapping, perfusion mapping, AI analytics, new metrology/QC frameworks, rapid CMR and CMR for pacemakers. We change how people think about the heart and accelerate delivery across boundaries (clinical disciplines, basic science, global healthcare).
**Covid Research:** Former Nightingale Hospital head of research. Chief Investigator: COVIDsortium, the HealthCare Workers Study. Started on lockdown day, the first HRA approved UK study. (~10 universities, NCT04318314). Grants from UKRI, Rosetrees, BMA. £1.4m raised (philanthropy – Goldman Sachs, Citadel Hedgefund, Justgiving). First 15 papers high impact eg Science, Lancet x3, PLOS1, Sci Immun, Circulation, EHJ, JACC imaging. 430 news articles to date. Informed national policies (UK, France, Spain, USA eg here)

**Senior academic Team:**

Professor Peter Kellman: Visiting professor UCL and Barts from NIH
Dr Charlotte Manisty: Senior Lecturer in Heart failure and CMR
Dr Thomas Treibel, Senior lecturer (BHF Intermediate)
Dr Rhodri Davies, machine learning and cardiology (BHF Accelerator)
Professor Marianna Fontana, Director Royal Free Hospital CMR (BHF Intermediate)
Dr Gaby Captur: Senior lecturer, UCL (LHA grant)
7. Dr Luis Lopes, cardiology and cardiomyopathy (Wellcome CARP)

**Infrastructure:** (BHC and CMIC are part of the UCL CMR network, with RFH and GOS).

1. **Barts Heart Centre:** the largest cardiac centre in Europe including the largest global CMR centre, Europes largest cardiac CT services; UKs largest echo service
2. **Chenies Mews Imaging Centre:** part of the UCL phenotyping centre, including 13 research clinic rooms, DEXA, 3x CPEX, and space for 20 researchers (Profs A Hughes, N Chaturvedi).

**Hardware:** CMR: 3x Aera, 2x Prisma, all upgraded with 32 core linux boxes and cloud reconstruction. CT: 1x Force. Echo: 19 machines, 5 sites. Nuclear: 4 sites inc PET-CT.

**Activity** (pa): 11,000 CMRs, 4500 cardiac CTs, 60,000 echos, 2500 nuclear cardiac scans.

**Software:** 3 CVI servers, ~30 workstations; Syngo.via x 2 networks, Hermes, Tomtec, GE image vault, REDCap running >250 studies. 5.7Tb image Corelab. SFTP file exchange server

**Supervision: Currently 6 fellows:**

1. **Dr George Joy:** microarchitecture of Hypertrophic Cardiomyopathy.
2. **Dr Jessica Artico:** Covid (maternity leave)
3. **Dr Hibba Gadir:** Fabry cardiomyopathy
4. **Dr Katia Menacho:** “The $100 dollar 15 minute CMR scan”
6. Dr Rebecca Hughes the clinical spectrum of apical HCM
7. Dr Kush Patel, the role of the myocardium in TAVI patients

Former Fellows: Flett, Hasleton, Sado, Bandula, Banyprasad, White, Fontana, Captur, Treibel, D’Silva, Cheang, Merghani, Kozor, Maestrini, Torasco, Scully, Abdel-Gadir, Knott, Scully

Current Grants Around 14 active grants
2020  MRC UKRI HCW 4 centre HCW merged £725K. Co-applicant (50K)
2020  Barts Charity: COVID-HCW Study: £1.46m. Chief investigator
2020  NIHR rolling call: COVID-Heart £800K. Co-applicant (~60K)
2020  UKRI Rapid Response: Curating UK COVID-19 diagnostics. £4.2m Co-applicant (£50K)
2020  Collaborator on grants from BMA, UK T cell consortium, Neutralising antibody consortium)
2020  SBRI phase 2 OpenCare commercialisation of AI for cardiac analysis £700K co-applicant
2019  multiple AI grants (BHF x 2; SBRI)
2019  Dr Luis Lopes, Senior Lecturer, MRC CARP, Profs Elliott/Moon
2019  Dr Tom Treibel, Senior Lecturer, BHF Intermediate, Profs Moon/Hughes
2019  Dr Rhodri Davies, Senior Lecturer, CAP-AI/BHF accelerator, Prof Moon/Hughes/Alexander
2018  Arrhythmia in Fabry Disease: Role of Implantable Loop Recorders.’ £800K co-I
2018  Dr Kush Patel, the role of the myocardium in TAVI patients (Edwards) ~60K
2018  The pathophysiology of revascularisation of the poor LV: £150K, Barts Charity
2017  Rebecca Hughes: The extended spectrum of apical HCM, £250K BHF
2016  The new cardiac phenotyping centre, UCL (2 magnets - £1.39million contribution UCLH charity)

National/International Collaborations:
COVIDsortium: The leading longitudinal mild disease COVID-19 cohort (~10 university collaboration).
AS700 – a 7 centre UK study in severe AS
Fabrys400 a 6 centre study (Birmingham, London x 3, Sydney, Brisbane)
T1MES program - a 79 centre T1 mapping phantom standardisation project
REDCap for UK cardiovascular research. Currently 250 research projects
Marathon platform: 120 subjects pre and post training for first marathon.
UCL: NIH partnership for new sequence validation by Peter Kellman
Perfusion mapping group: 13 centre collaboration
Ultrafast CMR in the developing world: projects in 8 countries. www.rapidcmr.com, links to 27 other countries.
Heartome1000: Advanced imaging and 1000 cardiac biopsies to basic science
Artificial Intelligence: aiming to increase cardiac imaging precision
MRI for pacemakers: aiming for 50,000 UK scans pa, saving 500 lives. www.mrimypacemaker.com

Boards: Immediate past president, BSCMR. Ed Board: Circulation, JCMR. Advisory: Genzyme, GSK, Shire.
Committees: BHF fellowships, NIHR long covid, Australia imaging, EACVI guidelines
Invited Talks ~40 talks a year (formerly).

Example 2020/2021 Papers

Augusto JB…Moon JC. AI for HCM wall thickness measurement: Lancet Digit Health. 2021
Augusto J..Moon JC. Healthcare Workers Bioresource: Study outline Wellcome Open 2020
Treibel TA…Moon JC. COVID-19 PCR in asymptomatic health-care workers. Lancet. 2020
Captur G..Moon JC. T1 mapping performance: the multi-national phantom program. JCMR. 2020
Scully PR..Moon JC. Dual AS and amyloid in TAVI. EHJ. 2020
Everett RJ..Moon JC..Dweck MR. ECV in AS. JACC. 2020
Menacho K..Moon JC. Myocardial Inflammation in HIV. JACC imaging. 2020
Abstract

Stress CMR is better
DAY 3 – AUGUST 21 (SATURDAY) / CHANNEL 2

14:00 - 15:30 (GMT + 7)

Educational Course 6
Echocardiography (joint with ASE)

Chairperson(s)

Prof. Pham Nguyen Vinh (VNM)
Prof. James Kirkpatrick (USA)

Speaker/Lecturers

Prof. Vera H. Rigolin (USA)
Prof. Jose Banchs (USA)
Dr. Wyman Lai (USA)
Prof. Pravin Patil (USA)
Dr. Nguyen Thi Thu Hoai (VNM)

14:00  The future of valve imaging  Prof. Vera H. Rigolin (USA)
14:15  Innovation of echocardiography for risk assessment  Prof. Jose Banchs (USA)
14:30  Innovation of echocardiography for congenital heart disease  Dr. Wyman Lai (USA)
14:45  Innovation of echocardiography and cardiac imaging in preventive cardiology  Prof. Pravin Patil (USA)
15:00  Update in Echocardiography in Competitive athletes- Roles of Multimodality Cardiac Imaging  Dr. Nguyen Thi Thu Hoai (VNM)
Speaker

Prof. Vera H. Rigolin
(USA)
Northwestern University Feinberg School of Medicine
Email v-rigolin@northwestern.edu

Employment
Aug 1996-present northwestern medicine
Northwestern university feinberg school of medicine
Chicago, IL
Assistant Professor of Medicine (1996-2004) Associate Professor of Medicine (2004-2012) Professor of Medicine (2012-present)
1995-1996 MACNEAL CARDIOLOGY
Staff Physician MacNeal Hospital - Berwyn, Illinois

Postgraduate training
Fellowship in Cardiology
1991-1992 Chief Medical Resident
1989-1992 Residency in Internal Medicine
1988-1989 Internship in Internal Medicine

Medical education
Doctor of Medicine

Undergraduate education
1980-1984 the university of michigan - Ann Arbor, Michigan
Bachelor of Science in Biology Degree Conferred with Distinction

Licensure
1994 North Carolina Board of Medical Examiners
1990 Illinois Department of Professional Regulation
Certification
1997 Diplomate in comprehensive echocardiography, American Society of Echocardiography Examination; Successful recertification 2006, 2017
1995 Diplomate in Cardiovascular Disease; Successful recertification 2005, 2015
1991 Diplomate of the American Board of Internal Medicine
1989 Diplomate of the National Board of Medical Examiners

Academic appointment
2009-Present Medical Director, Echocardiography Laboratory - Northwestern Memorial Hospital 2007-2009 Co-Director, Echocardiography Laboratory - Northwestern Memorial Hospital 2005-Present Associate Medical Director – Bluhm Cardiovascular Institute’s Center for Women’s

Cardiovascular Health
2003-2007 Director, Cardiology Fellowship Program – Northwestern University
2012-Present Professor of Medicine – Northwestern University
2004-2012 Associate Professor of Medicine – Northwestern University 1996-2004 Assistant Professor of Medicine - Northwestern University 1991-1992 Instructor of Clinical Medicine - Northwestern University

Hospital appointments
1996-Present Staff Physician - Northwestern Memorial Hospital, Chicago, IL 1996-2004 Staff Physician - Lakeside VA Medical Center, Chicago, IL 1995-1996 Staff Physician - MacNeal Hospital, Berwyn IL 1991-1992 Staff Physician - Lakeside VA Medical Center, Chicago IL

Honors/awards
2017 Jacques Smith Distinguished Physician Award
2017 10th Annual Arthur Weyman Award
2009 Northwestern Medical Faculty Foundation Clinical Collaborator Award 2006
AOA Northwestern Alumni Chapter Member
1999 Northwestern University Division of Cardiology Teacher of the Year Award
1999 American College of Cardiology W. Proctor Harvey, MD Young Teacher Award
1986 Bernard M. Baruch Essay Contest - Second Place
1983 Mortar Board Honor Society
1983 Golden Key National Honor Society 1980-84
University of Michigan Honor Roll
Abstract

The future of valve imaging

Valvular heart disease affects millions of people around the world. Cardiovascular imaging plays a pivotal role in the diagnosis and management of valvular disorders. Over the past several years, our understanding of the pathophysiology of valvular heart disease has grown exponentially as have treatment options. This presentation will first review the current state of the art of multimodality imaging for valvular heart disease. This will then be followed by a discussion pertaining to future developments to enhance our understanding of disease processes, expand access to care and increase quality and reproducibility of imaging studies.
Speaker

Prof. Jose Banchs
(USA)

Email jbanchs@gmail.com

Current Affiliations

Director of Echocardiography, Department of Medicine, Division of Cardiology, The University of Colorado, Anschutz Medical Campus, Denver, CO, 6/2021-present

Visiting Professor, Department of Medicine, Division of Cardiology, The University of Colorado, Denver, CO, 6/2021-present

Academic Appointments

Assistant Professor, Department of Cardiology, Division of Internal Medicine, The University of Texas MD Anderson Cancer Center, Houston, TX, 3/2009-4/2014

Associate Professor, Department of Cardiology, Division of Internal Medicine, The University of Texas MD Anderson Cancer Center, Houston, TX, 4/2014-6/2021

Publications

66 Peer-Reviewed Original Research Articles
9 Book chapters
1 Book

Abstract

Innovation of echocardiography for risk assessment
Dr. Wyman W. Lai is the Co-Medical Director of the CHOC Children’s Heart Institute and Clinical Professor of Pediatrics at University of California, Irvine. He is also the Director of Echocardiography at CHOC Children’s in Orange County, California. Dr. Lai’s research interests include the echocardiographic description of complex congenital heart disease and the use of non-invasive imaging techniques for the assessment of ventricular function and cardiovascular flow. He is also investigating the role of artificial intelligence in pediatric cardiology.

Dr. Lai is the lead editor of the comprehensive textbook, “Echocardiography in Pediatric and Congenital Heart Disease: From Fetus to Adult.” Dr. Lai has served on the Board of Directors of the American Society of Echocardiography and the National Board of Echocardiography.

**Abstracts**

**Innovation of echocardiography for congenital heart disease**

The field of echocardiography for congenital heart disease is advancing rapidly, benefiting from innovations that service a broader segment of medicine. Point of Care Ultrasound (POCUS) can be utilized by non-traditional users to manage children with congenital and acquired heart disease in children. It may be particularly useful in resource limited setting.

On the other end of the resource spectrum is the adoption of 3D echocardiography for the planning and guidance of transcatheter and surgical procedures. We are also capable of fusing echocardiographic information with other modalities of imaging and mapping.

Finally, the role of artificial intelligence (AI) in pediatric cardiology imaging is threefold: 1) AI can augment the diagnostic acumen of physicians in echocardiography, cardiac MRI, CT angiography, and nuclear cardiology; 2) AI applications can facilitate image acquisition and optimization; and 3) AI can function to improve education and training in congenital heart disease through augmented and virtual reality.


Speaker

Prof. Pravin Patil

(USA)

Board certification
Diplomate, American Board of Internal Medicine (Internal Medicine) 2007
Diplomate, American Board of Internal Medicine (Cardiovascular Disease) 2011
Diplomate, Certification Board of Cardiovascular Computed Tomography 2011
Diplomate, Certification Board of Nuclear Cardiology 2012
Diplomate, National Board of Echocardiography 2010, 2020
Registered Physician Vascular Interpretation, RPVI 2014

Academic honors and awards
Cardiology Fellowship Faculty Teaching Award Temple University 2018
Alumni Recognition Award St. George’s University 2016
Fellowship Teaching Award University of Connecticut 2010
Gold Prize Cardiac MRI & CT, Cannes, FR 2010
Ambulatory Care Award University of Connecticut 2007
Program Director’s Letter of Clinical Excellence University of Connecticut 2004
Iota Epsilon Alpha St. George’s University 2000
Chancellor’s List St. George’s University 2000
James B. Angell Scholar University of Michigan 1998
Tau Beta Pi University of Michigan 1995
Dean’s List University of Michigan 1995

Appointments

Academic
Associate Professor of Medicine July 2017 - Present Section of Cardiology
Temple University School of Medicine Philadelphia, PA
Program Director Aug 2016 – Present
Cardiovascular Disease Fellowship Training Program Temple University School of Medicine Philadelphia, PA

Associate Program Director May 2012 – July 2016 Cardiovascular Disease Fellowship Training Program
Temple University School of Medicine Philadelphia, PA

Director Medical Student Clerkship in Cardiology Sept 2013 – Present Temple University School of Medicine Philadelphia, PA

Visiting Professor in Cardiology February 2013 - Present St. George’s University School of Medicine Grenada, West Indies

Assistant Professor of Clinical Medicine Sept 2011 – June 2017 Section of Cardiology Temple University School of Medicine Philadelphia, PA

Clinical Instructor July 2007 – June 2008
Yale University School of Medicine New Haven, CT

Publications:
Peer-reviewed articles


Abstract

Innovation of echocardiography and cardiac imaging in preventive cardiology

Echocardiography is the cornerstone imaging modality of cardiovascular disease. Innovation in echocardiographic technology has brought novel ways to image the blood-pool, blood flow and structural heart disease. Clinical integration of echocardiography with wide field of view cardiac imaging such as cardiac magnetic resonance and cardiac computed tomography has led to enhanced patient care.
**Speaker**

Dr. Nguyen Thi Thu Hoai  
(VNM)

**Abstract**

Update in Echocardiography in Competitive athletes- Roles of Multimodality Cardiac Imaging
DAY 3 – AUGUST 21 (SATURDAY) / CHANNEL 3

14:00 - 15:30 (GMT + 7)

Refresh course 4
Congenital heart disease

Chairperson(s)

Dr. Nguyen Ngoc Trang (VNM)  Prof. Hyun Woo Goo (KOR)

Speaker/Lecturers

Dr. Duong Phi Son (VNM)  Dr. Hideki Ota (JP)  Prof. Whal Lee (KR)  Prof. Hyun Woo Goo (KOR)

14:00  CT evaluation of CHD  Dr. Duong Phi Son (VN)
14:20  MR evaluation of CHD  Dr. Hideki Ota (JP)
14:40  Role of 3D printing  Prof. Whal Lee (KR)
15:00  Postoperative of CHD  Prof. Hyun Woo Goo (KR)
Speaker

Dr. Duong Phi Son
(VNM)
Medic Medical Center
Email drphison0912@gmail.com

Education Background
M.D. Ho Chi Minh City University of Medicine and Pharmacy, Vietnam (2004)
M.S. Pham Ngoc Thach University of Medicine, Vietnam (2015)

Professional Career
2004.08 – 2007.08 Cardiology, Binh An Hospital, Kien Giang Province, Vietnam
2007.08 – current Cardiology and Radiology, Medic Medical Center, Ho Chi Minh city, Vietnam

Publications (the latest articles)
1. Duong Phi Son, Nguyen Tuan Vu, Phan Thanh Hai. CD Atlas Cardiovascular CT. 2007
3. Duong Phi Son, Nguyen Tuan Vu, Phan Thanh Hai. The study of clinical characteristics, paraclinical and Computed Tomography Imaging of pulmonary atresia with ventricular septal defect. Ho Chi Minh city medicine journal, supplement Vol 22-No 3-2018; 232-239
4. Duong Phi Son, Nguyen Tuan Vu, Phan Thanh Hai. MDCT for Cardiovascular disease diagnosis. Current Medicine, journal of Ho Chi Minh city Medical Association, No 4-2019; 104-110
5. LUPINE Publisher, ISSN:2638-5368 “MSCT In Diagnosis of Congenital Heart Diseases in Vietnam” Advancements in cardiovascular research, DOI: 10.32474/ACR.2019.02.00013
6. OAT Publisher, ISSN:2399-7400 “Role of multi-detector computed tomography in congenital heart diseases” Vascul Dis Ther, 2019, DOI: 10.15761/VDT.1000163
Abstract

CT evaluation of CHD

Role of multi-detector computed tomography
In complex congenital heart diseases

Background:
Complex congenital heart diseases associated with more malformations, complex aortopulmonary collaterals and anomalous coronary artery.
Echocardiography is the initial diagnostic method but this method can be limited in complex congenital heart diseases.

Purpose:
To assess the role of MDCT in complex congenital heart diseases (CHD) diagnosis compare with operative result and interventional angiography.

Methods:
910 patients with complex congenital heart diseases of 31,000 patients underwent cardiac angiography with 64 and 640 section CT at Medic Medical Center since 09/09/2006 to 30/12/2015.

Results:
There are 658 operated cases, most of operated cases demonstrated the exact diagnosis of MDCT in complex congenital heart diseases.

Conclusions:
MDCT is the fast and non-invasive diagnostic method with the high accuracy, overcomes the limit of echocardiography in complex congenital heart diseases diagnosis and provide with the panorama and useful informations prior to the operation.
Speaker

Dr. Hideki Ota

(JPN)
Department of Advanced MRI Collaborative Research,
Tohoku University Graduate School of Medicine
Email h-ota@rad.med.tohoku.ac.jp

Education:
2006 Ph.D. Diagnostic Radiology, Tohoku University, Graduate School of Medicine, Sendai, Miyagi, Japan
2000 M.D. Tohoku University, School of Medicine, Sendai, Miyagi, Japan
Specialization: Cardiac and vascular Radiology, interventional radiology

Academic Appointments:
Oct 2018 – present. Associate Prof. Department of Advanced MRI Collaborative Research, Tohoku University Graduate School of Medicine, Sendai, Japan
May 2008- Sep. 2008 Senior fellow, Department of Radiology, Michigan State University, East Lansing, MI.
Sep. 2007- Apr. 2008 Senior fellow, The Vascular Imaging Lab., Department of Radiology, University of Washington, Seattle, WA.

Professional memberships:
Japan Radiological Society, the Japanese Society of Interventional Radiology (Delegate), the Japanese College of Radiology (Director), Japan Society of Cardiovascular Radiology (International Committee), Japanese Collage of Angiology (Board of Trustees), RSNA, ESR, ISMRM, ASCI.

Reviewer:
Magnetic Resonance in Medical Science, Acta Radiologica, American Journal of Neuroradiology, Circulation Journal, JMRI
Abstract

MR evaluation of CHD

Essentials of CMR for Adult Congenital Heart Diseases

With the advances in surgical technique, post-operative intensive care, and medical treatment, the number of survivors from congenital heart disease (CHD) has been increasing in recent decades. ACHD patients develop several pathological conditions, such as heart failure, pulmonary hypertension, liver and/or kidney dysfunction, or cerebral infarction. Therefore, comprehensive radiological assessment is required for management of patients with ACHD. Cardiac MR imaging (CMR) is routinely acquired for ACHD. Cine MR provides cardiac morphology and function. CMR also gives information on blood flow for evaluation of stenosis and regurgitation. 4D flow MRI can be used to understand 3-dimensional flow properties. CMR parameters become important markers for surgical intervention before cardiac function is irreversibly deteriorated during follow-up. CT can visualize the detailed morphology of the heart and blood vessels, including collaterals associated with congenital heart disease. That information is used for surgical and transcatheter interventions. Both imaging modalities are also used for post-surgical evaluation of ACHD.

Some types of congenital abnormalities are incidentally found on routine clinical imaging.

In this presentation, selected ACHD cases are described, mainly focusing on CMR. Those include repaired tetralogy of Fallot, diseases treated with Fontan’s circulation, intra- and extra-cardiac shunts, and valvular diseases. Indication, protocols, typical findings, and pitfalls will be discussed.
Speaker

Prof. Whal Lee

(KOR)
Department of Radiology
Seoul National University Hospital

Email whal.lee@gmail.com

Prof. Whal Lee Bio

Prof. Whal Lee graduated with a medical degree from the Seoul National University and got the master degree and PhD degree in the same university. He completed his fellowship and instructor trainings at the Seoul National University Hospital in Korea and Hospital for Sick Children in Canada and is a Professor in Department of Radiology, Seoul National University Hospital and Seoul National University College of Medicine. Prof. Lee is an active member of a number of professional societies including the Korean Society of Radiology, Korean Society of Cardiovascular Imaging, Asian Society of Cardiovascular Imaging, Korean Society of Ultrasound Medicine, Bioengineering society for circulatory disorders, Korean Society of Circulation and Korean Society of Magnetic Resonance in Medicine. During the course of his career, he has published 14 book chapters and 140 SCI/SCIE articles related to radiology and imaging. He is one of editors of Acta Radiologica and an editor in chief of Investigative Magnetic Resonance Imaging. Moreover, he is an assistant secretary general of presidential office and a director of Speaker Bureau of Asian Society of Cardiovascular Imaging. He is also an international liaison director of Korean Society of Radiology and office director of Asian-Oceanian Society of Radiology. Prof. Lee is currently a member of DUR committee of Korea Institute of Drug Safety and Risk Management and a secretary general of Asian Society of Magnetic Resonance in Medicine.
Speaker

Prof. Hyun Woo Goo

(KOR)

Institute Asan Medical Center
University of Ulsan College of Medicine
Email hwgoo@amc.seoul.kr

Education Background
1983 – 1986  Hansung High School, Seoul, Korea
1986 – 1992  M.D., Catholic University College of Medicine, Seoul, Korea
1994 – 1996  M.S., Ulsan University College of Medicine, Seoul, Korea
1996 – 2001  Ph.D., Ulsan University, College of Medicine, Seoul, Korea

Professional Career
2002 - 2004  University of Ulsan College of Medicine, Seoul, Korea
Instructor of Radiology
2004 – 2008  University of Ulsan College of Medicine, Seoul, Korea
Assistant Professor of Radiology
2008 – 2013  University of Ulsan College of Medicine, Seoul, Korea
Associate Professor of Radiology
2013 – Present  University of Ulsan College of Medicine, Seoul, Korea
Professor of Radiology

Publications (the latest 5 articles)
Goo HW. Radiation dose, contrast enhancement, image noise and heart rate variability of ECG-gated CT volumetry using 3D threshold-based segmentation: Comparison between conventional single scan and dual focused scan methods. Eur J Radiol 2021 Apr;137:109606.
Abstract

Postoperative of CHD

Cardiac CT and MRI are useful for evaluating various congenital heart disease after surgical or interventional treatment. In most Asian countries, cardiac CT is more frequently used than cardiac MRI for that purpose, which is significantly associated with low health expenditures per capita. Therefore, the assessment of ventricular function and asymmetric pulmonary vascularity is recently done using cardiac CT instead of cardiac MRI. The airway evaluation is a unique advantage of cardiac CT, while the evaluation of blood flow, myocardial characterization, and lymphatic abnormalities are merits of cardiac MRI. Aims of post-treatment imaging include confirming expected post-treatment effects, detecting complications, predicting clinical outcome, and selecting optimal treatment in patients requiring multi-stage treatment. This presentation will demonstrate how cardiac CT and MRI can be used for left heart defects, right heart defects, and functional single ventricle after treatment. After this presentation, the audience will be more familiar with the post-treatment imaging findings.
The 14th Congress of Asian Society of Cardiovascular Imaging (ASCI 2021)

DAY 2 – AUGUST 20 (FRIDAY) / CHANNEL 3

10:30 - 12:00 (GMT + 7)

Best Young Presenter Award

Brief introduction:

Prof. Jin Hur (KOR)

Speaker/Lecturers

Jian He (CHN)
Habibie Arifianto (IDN)
Baiyan Zhuang (CHN)
Eun-Ju Kang (KOR)
Anh Thi Ngoc Chau (VNM)

10:30  MRI derived Global Early Diastolic Longitudinal Strain Rate and Prognosis of Patients with Heart Failure with Preserved Ejection Fraction (HfPEF)

Jian He (CHN)

10:40  Rest Perfusion Myocardial Computed Tomography: a Novel Imaging Marker for Left Ventricular Ejection Fraction Recovery in Systolic Heart Failure Patients

Habibie Arifianto, MD, FIHA (IDN)

10:50  Identify Ischemic, Infarcted, Hibernate, and Normal Myocardium by Stress and Rest T1 Mapping without the Application of Gadolinium Contrast Agents

Baiyan Zhuang (CHN)

11:00  Feasibility of a deep learning-based stair-step artifact reduction in coronal reformation of contrast-enhance chest CT

Eun-Ju Kang (KOR)

11:10  Texture analysis of magnetic resonance T1 maps and extracellular volume in heart failure compared with normal controls

Anh Thi Ngoc Chau (VNM)
**Speaker**

**Jian He**  
(CHN)

Cardiovascular MRI diagnosis and clinical study  
Fuwai Hospital, State Key Laboratory of  
Cardiovascular Disease, National Center for  
Cardiovascular Diseases

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**Education**

Sep 2013-Jun 2018: Qingdao University

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**Graduate Education**

Sep 2018-: PhD student in Chinese Academy of Medical Sciences and  
Peking Union Medical College

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**Academic Appointments**

Youth Editorial Committee of European Hear Journal-Interventional Therapy,  
Chinese edition

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**Scientific Publications**


3. He J, Arlene Sirajuddin, Shuang Li, et al. Heart Failure with Preserved Ejection  
Fraction in Hypertension Patients: A Myocardial Strain Study. JMRI. IF:3.954.

J, Zhang C, Qian H, Lu M, Zhou X. The prognostic value of myocardial injury in  
COVID-19 patients and associated characteristics. Immun Inflamm Dis. 2021 Jul  

cardiomyopathy but have unexplained giant T-wave inversion: a cardiovascular  
magnetic resonance mid-term follow-up study. J Cardiovasc Magn  
MRI derived Global Early Diastolic Longitudinal Strain Rate and Prognosis of Patients with Heart Failure with Preserved Ejection Fraction (HFpEF)

Jian He
Cardiovascular MRI diagnosis and clinical study Fuwai Hospital, State Key Laboratory of Cardiovascular Disease, National Center for Cardiovascular Diseases

**Purpose:** Direct assessment of subclinical myocardial dysfunction by feature-tracking has shown promise in prognosis evaluation of heart failure (HF) with preserved ejection fraction (HFpEF). Global early diastolic longitudinal strain rate (eGLSR) can identify earlier diastolic dysfunction, however, limited data were available about its prognostic value in HFpEF. To evaluate the association between left ventricular (LV) eGLSR and primary composite outcomes (all-cause death or heart failure hospitalization) in patients with HFpEF.

**Materials and Methods:** In this retrospective study, consecutive patients (enrolled from Jan 2010 to Mar 2013) with HFpEF underwent cardiovascular magnetic resonance (CMR) imaging. Correlation between eGLSR and variables was assessed using linear regression. Association between eGLSR (feature-tracking) and outcomes were analyzed using Cox proportional regression.

**Results:** A total of 186 HFpEF patients (mean age, 59±12 years, 41% women) were included. eGLSR displayed weak correlations with LV end-diastole volume index (r=-0.35, P<.001), heart rate (r=0.35, P<.001), and LV ejection fraction (r=0.30, P<.001) and a moderate correlation with LV end-systole volume index (r=-0.41, P<.001). At a median follow-up of 9.2 years (interquartile range, 8.7–10.0 years), 72 patients experienced primary composite outcomes. Impaired eGLSR, defined as eGLSR<0.57/s, was associated with an increased risk of heart failure hospitalization or all-cause death (adjusted hazard ratio, 2.01, 95% confidence interval, 1.10–3.66; P=.02) after adjusting for multiple clinical and imaging-based variables.

**Conclusion:** Left ventricular global early diastolic longitudinal strain rate, an easily quantifiable marker obtained from CMR feature-tracking, is independently associated with adverse outcomes in patients with Heart failure with preserved ejection fraction.

**Key words:** Magnetic resonance imaging, feature-tracking, heart failure with preserved ejection fraction, early diastolic longitudinal strain rate
Kaplan-Meier plot showed the relationship of global early diastolic longitudinal strain rate (eGLSR) and global longitudinal strain (GLS) and proportion surviving by using a composite end point of heart failure hospitalization and all-cause death. Participants with an eGLSR less than the median of 0.57/s and GLS greater than the median of -15.2% at feature-tracking cardiovascular MRI showed a higher event rate (log-rank test, P=.003 or P=.03, respectively).
**Speaker**

**Habibie Arifianto, MD, FIHA**  
*(IDN)*  
Universitas Sebelas Maret Hospital, Sukoharjo, Indonesia  
Email habibie.arifianto@staff.uns.ac.id

**Education**

Graduated Medical degree at 2008 and Speciality Training on Cardiovascular Diseases at 2016 and was taken on Faculty of Medicine, Sebelas Maret University, Solo, Indonesia

**Post-Graduate Education**

Finished Fellowship on Nuclear Cardiology and Cardiovascular Imaging at National Heart Centre Harapan Kita, Jakarta, Indonesia at 2018

**Academic Appointments**

Lecture on Cardiology and Vascular Medicine at Faculty of Medicine, Sebelas Maret University  
Head of Cardiovascular Imaging Division, Department of Cardiology and Vascular Medicine, Faculty of Medicine, Sebelas Maret University  
Head of Cardiology and Vascular Medicine Department at Universitas Sebelas Maret Hospital, Sukoharjo, Indonesia

**Professional Affiliations and Scientific Publications**

Member of Indonesian Medical Association  
Member of Indonesian Heart Association  
Member of Indonesian Society of Cardiovascular Imaging  
Head of Research on Indonesian Working Group on Heart Failure
Rest Perfusion Myocardial Computed Tomography: a Novel Imaging Marker for Left Ventricular Ejection Fraction Recovery in Systolic Heart Failure Patients

Habibie Arifianto¹, Sofina Kusnadi², S.P. Mahaley², Manoefris Kasim³

¹ Division of Cardiovascular Imaging, Universitas Sebelas Maret Hospital, Sukoharjo, Indonesia, Member of Indonesian Society of Cardiovascular Imaging, Indonesian Heart Association
² Cardiology and Vascular Department Fellows Faculty of Medicine, Universitas Sebelas Maret
³ Division of Cardiovascular Imaging, National Heart Centre Harapan Kita Hospital, Jakarta Indonesia, Member of Indonesian Society of Cardiovascular Imaging, Indonesian Heart Association

Objective: Heart failure has become a global pandemic and a burden to modern civilization. Besides having the ability to rule out a coronary problem in heart failure, multislice computed tomography (MSCT) can also be used to assess myocardial perfusion at rest. However, only limited data is available worldwide.

Materials and Methods: Forty-seven patients with heart failure reduced ejection fraction (HFrEF) were consecutively assessed at Heart Failure Clinic in UNS Hospital from January to June 2018. Baseline left ventricular ejection fraction (LVEF) was measured by echocardiography Simpson method. Patients were sent to perform contrast coronary CT angiography. The hypoperfusion area was counted at phase 40% using a standard of 17 myocardial segments based on ASE guidelines. Patients were followed up for LVEF after six months medically managed.

Results: Data from 47 patients were assessed and divided into two groups of patients with ≤2 and > 2 perfusion defect segments. The group with ≤2 perfusion defect segments showed significant improvement of LVEF compared to the group with >2 perfusion defect segments with mean improvement of 27.9 ±11.85 vs 11.8± 9.79 (p<0.001). A receiver operating characteristic (ROC) curve analysis revealed perfusion defect segments ≤2 has an area under curve (AUC) 0.789 with 72.2% sensitivity and 81.1% specificity for predicting improvement of LVEF.

Conclusions: This study showed that MSCT could be used as a one-stop solution to evaluate coronary anatomy and offers the ability as a prognostic marker of LVEF recovery in HFREF patients.

Keywords: Heart failure, myocardial perfusion, rest perfusion CT, LVEF.
Identify Ischemic, Infarcted, Hibernate, and Normal Myocardium by Stress and Rest T1 Mapping without the Application of Gadolinium Contrast Agents

Baiyan Zhuang

**Background:** In chronic coronary artery disease, accurate detection of ischemic and hibernant myocardium is important because targeted revascularization improves clinical outcomes. The aim of this study was to evaluate the potential of T1 mapping at rest and during adenosine triphosphate stress for the detection of ischemic, hibernant and infarct myocardium in a swine model using pathology as gold reference.

**Method:** Twelve adult male Chinese miniature swine with the induction of chronic coronary artery stenosis were enrolled in this study. The CMR imaging was performed at four time points: baseline, 1 week-, 2 weeks- and 4 weeks- after surgery. Pre- and post-contrast T1 mapping at rest and during adenosine triphosphate stress, first-pass perfusion and stress perfusion as well as late gadolinium enhancement were performed at all imaging time points. Myocardial perfusion reserve index (MPRI) were calculated. The native T1, extracellular volume (ECV) and their percentage were also calculated.

**Result:** The rest native T1 value of infarct, hibernant, ischemia and normal myocardium were 1586.4±159.0ms, 1350.7±165.5ms, 1218.8±153.4ms, 1101.8±107.7ms, respectively. The rest ECV value of infarct, hibernant, ischemia and normal myocardium were 73.89±8.27, 40.25±7.77, 34.09±3.00, 24.48±2.71, respectively. MPRI were associated with the change of native T1 (stress native T1 minus rest native T1) (R=-0.45, p=0.005) and native T1 percentage (△native T1/ rest native T1) (R=-0.50, p=0.034). Besides, there were correlation observed between MPRI and the change of ECV (R=-0.41, p<0.001) and ECV percentage (R=-0.41, p=0.005).

**Conclusion:** We identified the native T1 and ECV values of four myocardium types in chronic ischemic cardiomyopathy. The rest/stress T1 mapping has the potential to detect ischemia and hibernation without the need for gadolinium contrast.

**Key word:** CMR, T1 mapping, hibernating myocardium, ischemic myocardium
Speaker

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2006: Bachelor degree, Kosin University College of Medicine, Busan, South Korea
2009: Master’s degree, Dong-A University College of Medicine, Department of Medicine, Busan, South Korea
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Post-Graduate Education
March 2006: Korean Medical Board, License
2006-2007: Medicine Internship, Dong-A University Hospital,
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Academic Appointments
2011: Visiting Fellow, Department of Radiology, Kyungpook National University Hospital
2011: Visiting Fellow, Department of Radiology and Cardiovascular Imaging Center, Samsung Medical Center, Seoul, South Korea
2011-2012: Instructor, Cardiovascular Imaging, Department of Radiology and Cardiovascular Center, Dong-A University Hospital
2012-2018: Assistant professor, Department of Radiology and Cardiovascular Center, Dong-A University Hospital
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Professional Affiliations and Scientific Publications
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Feasibility of a deep learning-based stair-step artifact reduction in coronal reformation of contrast-enhance chest CT

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**Objective:** To evaluate the feasibility of imaging artifact reduction on coronal reformation of contrast enhance chest CT by using a deep learning based noised reduction method.

**Methods:** A total of 110 CT image sets (55 pairs of concordant 16- and 320-row CT images) for 55 patients who underwent chest CT more than twice with different CT scanner, were included and used to train a deep-learning algorithm for artifact correction. For internal validation, 16-row CT images of 25 patients were underwent correction processing, and the image quality was compared between the original (“CTorigin”) and deep learning based corrected (“CTcorrect”) CT images. For external validation, chest CT images of 30 patients, acquired from other institutions by different scanners, were subjected to correction processing, and the image quality was compared using the same method. Quantitative analysis for stair-step artifact (coefficient of variance [CV] of CT density on coronal reformation), image noise, signal-to-noise ratio (SNR), and contrast-to-noise ratio (CNR) were evaluated. The subjective image quality scores (5-point scale) were evaluated for image contrast, stair-step artifact, and conspicuity for major structures.

**Results:** CTcorrect showed significantly reduced stair-step artifact (mean CV: CTorigin 7.35±2.0 vs CTcorrect 5.17±2.4, P <0.001) and image noise while improved SNR and CNR in the aorta, pulmonary artery, and liver compared to CTorigin (P <0.01). On the subjective analysis, CTcorrect had higher image contrast, lower artifact, and better conspicuity than CTorigin did. On external validation, most results were consistent with internal validation sets, except for those for the pulmonary artery.

**Conclusions:** Deep learning based denoising method significantly improved image quality of coronal reformation chest CT by reducing the stair-step artifact and image noise.

**Key words:** Chest; Tomography x-ray; Image reconstruction; Deep learning; Artificial intelligence
Speaker

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Education
2010-2012 Master degree from Ho Chi Minh City University of Medicine and Pharmacy, Viet Nam
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Post-Graduate Education
11/2019-1/2020 Cardiac MRI – Kaohsiung Veterans General Hospital, Taiwan
6/2017 CMR level 1- National Heart Centre Singapore, Singapore
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Academic Appointments
Viet Nam Society of Radiology and Nuclear medicine (member)
Asian Society of Cardiovascular Imaging (member)
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Professional Affiliations and Scientific Publications
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Texture analysis of magnetic resonance T1 maps and extracellular volume in heart failure compared with normal controls

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**Objective:** To assess the T1 and extracellular volume (ECV) maps of left ventricle (LV) of patients with non-ischemic heart failure (NIHF) by cardiac MRI

**Materials & Methods:** This retrospective study included 23 NIHF (mean age = 48.1 years, 12 M), 25 matched healthy control (HC) performed CMR on 3T scanner (Skyra, Siemens). NIHF was diagnosed by echocardiography, coronary artery angiogram and myocardial perfusion SPECT. Native T1 map was obtained by modified MOLLI 5-3 sequence and ECV was calculated 12 min. after GBCA 1.5 dose with 4-3-2 sequence on 4C view. Texture analysis was performed with LIFEx(www.lifexsoft.org). We also measured the wall thickness (WT) and outer diameter (OD) of LV.

**Results:** NIHF had larger OD of LV (78 +/- 16 mm) than the HC (57+/- 6 mm) (P<0.001) while the WT had no difference (10.9 +/- 3.4 mm vs. 10.2 +/- 2.6 mm, P=0.41). Native T1 was significantly higher in NIHF patients (1310+/- 48 ms) compared to HC (1208+/- 72 ms) (P<0.001), while the ECV showed no difference (29+/- 4.8% vs. 27+/- 5%, P=0.30). The texture analysis of T1 and ECV maps showed no difference in the first-order textures and had significant difference in several second-order textures, such as GLRLM, GLZLM. There was inverse correlation of ECV and WT of LV in NIHF (R=-0.61, P=0.002).

**Conclusions:** In NIHF with preserved WT of LV, texture analysis of T1 and ECV maps showed difference in the mean value of native T1 and texture features, which is promising as a base for machine learning with future larger cohort.
Assessment of left ventricular volumes, ejection fraction and regional wall motion in patients undergoing 256-Slice Dual-Source Coronary CT Angiography: a comparison with 2D-echocardiography

Le Thi Thuy Lien (VNM)

Second-generation dual-source CT in the diagnosis of congenital heart diseases at Vietnam National Children’s Hospital

Nguyen Thi Thanh Huong (VNM)

Correlation between diastolic left ventricular mechanical dyssynchrony parameters by gated single-photon emission computed tomography myocardial perfusion imaging and left ventricular echocardiographic indexes in early post-myocardial infarction patients

Mai Hong Son (VNM)

Novel Intraventricular thrombus of COVID-19 Healthy Heart Patient

Fitri Kusumastuti (IND)

Feature tracking computed tomography-derived left ventricular strain: impact according to slice thickness of the reconstructed image

Sang Il Choi (KOR)

severe pulmonary arterial hypertension with haemoptysis in adults caused by patent ductus arteriosus. The diagnostic approach and treatment strategy

Nguyen Hoang Dung (VNM)

Diagnosis of coronary artery fistulas by multi detector computed tomography

Phung Bao Ngoc (VNM)


**Speaker**

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**Education**

Hanoi Medical University 2001-2007

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**Post-Graduate Education**

Radiology Resident Doctor, Hanoi Medical University, 2008-2011
Fellow in cardiac imaging, Seoul National University Hospital, 2014
Specialist II, Hanoi medical University, 2018-2020

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**Academic Appointments**

APSCR 2012
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**Professional Affiliations and Scientific Publications**


Assessment of left ventricular volumes, ejection fraction and regional wall motion in patients undergoing 256-Slice Dual-Source Coronary CT Angiography: a comparison with 2D-echocardiography

Le Thi Thuy Lien, Nguyen Khoi Viet, Nguyen Ngoc Trang, Hoang Van Hoa, Phung Bao Ngoc, Pham Minh Thong

Purpose: To compare DSCT using 256-slice coronary CT angiography (SOMATOMA Definition FLASH, Siemens Medical Solution, Germany) with echocardiography for the determination of left ventrical dimentions, left ventricular ejection fraction (LVEF), end-diastolic volume (EDV), end-systolic volume (ESV), regional wall motion as well as assessing coronary artery image quality and patient radiation dose

Retrospective and Prospective study: Retropective Study

One-hundred twelve patients were referred for DSCT for evaluation of coronary artery and underwent DSCT and transthoracal echocardiography within 1 week. LV dimentions, EF, EDV and ESV were determined for both DSCT and echocardiography, and the correlation coefficients were assessed. Measurements of dimensions were obtained in standardized planes in end-systole and end-diastole and included the septal and posterior wall thickness, and inner diameter of the left ventricle. Global left ventricular (LV) functional parameters [end-systolic volume (ESV), end-diastolic volume (EDV), ejection fraction] were computed using automated software. ESV, EDV were normalized to the body-surface-area (BSA). Correlation between DSCT and echocardiography was tested through linear regression and Bland-Altman analysis. Regional wall motion is collected by visual (1, normal, 2, hypokinesis, 3, dysphagia or akinesia). Coronary artery segment subjective image quality (1, excellent; 4, poor) and radiation dose were recorded.

Results: A direct comparison between 256-slice Dual-Source CT and 2D-echocardiography was performed in 112 patients (43men; 61,26 ± 11,68 mean age years) who were clinically referred for MSCT coronary angiography. LV end-diastolic volumes (LVEDV) and LV endsystolic volumes (LVESV) were determined and the LV ejection fraction (LVEF) was derived. Average LVEF was 66,24± 13,52% (range 23-85%) as determined on DSCT, compared with 65,72±11,31% (range 25-84%) on 2D echocardiography. Evaluation of LVEF by linear regression analysis showed a good correlation between DSCT and 2D-echocardiography (r= 0,715; P < .001). Good correlations between DSCT and 2D-echocardiography were demonstrated for the assessment of LVEDV (r=0,732; P< .001) and LVESV (r= 0,841; P < .001). At Bland-Altman analysis, mean differences (±SD) of 1,78 ± 24,10 mL (p <0 .05) and 0,766 ± 13,7 mL (p < 0.05) were observed between DSCT and 2D-echocardiography for LVEDV and LVESV, respectively. LVEF was slightly overestimated with DSCT (0.52 ±9,59%; p < 0.05). Resultly, the LVEFs calculated
by DSCT and echocardiography were not statistically different. However, LVEF, EDV and ESV from MDCT were statistically higher than those from echocardiography (p < 0.05). The average image quality score of the coronary artery segment was 1.79. The mean patient radiation dose was 3.78 ±1.88 mSv.

**Conclusion:** In conclusion, the use of 256-slice DSCT can provide comparable results to those using 2D-TTE for LV function include EF, EDV, ESV and regional wall motion assessment in a heterogeneous population.

**Keywords:** DSCT; Coronary Artery Disease; Left ventricular function; Echocardiography; Radiation
Speaker

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Education

2000 – 2006: Hanoi Medical University, Ha Noi, Viet Nam
Medical Doctor (MD)

Post-Graduate Education

2008 – 2009: Hanoi Medical University, Ha Noi, Viet Nam
Certificate of radiology orientation

2012 – 2013: University Hospital of Angers - Medical and Pharmacy University of Angers city, France
DFMSA (Diplôme de formation médicale spécialisée approfondie - Advanced medical training diploma)

2016 – 2018: Hanoi Medical University, Ha Noi, Viet Nam
Master of Radiology

Academic Appointments

27th Feb – 3rd Mar 2019: European Congress of Radiology ECR 2019, Vienna, Austria
Oral presentation: “Second generation of dual source computed tomography for evaluating coronary artery lesions in pediatric patients with Kawasaki disease”

18th – 20th March 2019: ASCI Cube 2019, Taipei, Taiwan
Oral presentation: “Second generation of dual source computed tomography for evaluating coronary artery lesions in pediatric patients with Kawasaki disease”

21st – 23rd March 2019: 13th ASCI 2019, Taipei, Taiwan
Oral presentation: “Second generation of dual source computed tomography for evaluating coronary artery lesions in pediatric patients with Kawasaki disease”

1st – 4th July 2021: 19th AOCR 2021, Malaysia
Oral presentation 1: “Second generation of dual source computed tomography for evaluating coronary artery lesions in pediatric patients with Kawasaki disease”
Oral presentation 2: “Ultrasound-guided core needle biopsy in the diagnosis of retroperitoneal tumors in children: a retrospective study on 52 cases”
Professional Affiliations and Scientific Publications

Professional Affiliations:
4/2008 – 7/2021: Radiologist, Department of Radiology, Viet Nam National Children’s Hospital

Scientific Publications:
1. Abstract published on 2019 Article ECR Books of abstracts
   “Second generation of dual source computed tomography for evaluating coronary artery lesions in pediatric patients with Kawasaki disease”
   - “Second generation of dual source computed tomography for evaluating coronary artery lesions in pediatric patients with Kawasaki disease”
   - “Ultrasound-guided core needle biopsy in the diagnosis of retroperitoneal tumors in children: a retrospective study on 52 cases”
Second-generation dual-source CT in the diagnosis of congenital heart diseases at Vietnam National Children’s Hospital

Nguyen Thi Thanh Huong¹, Nguyen Duc Thang¹, Nguyen Dinh Phuong¹, Nguyen Van Viet¹, Nguyen Ngoc Trang²

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**Background:** Congenital heart diseases (CHD) affect ~ 1% of all live births in the general population. Cardiovascular computed tomography (CT) in pediatric CHD patients is often challenging due to uncooperative children and high heart rates. Today with recent developments of CT technology especially high-speed acquisition and radiation dose reduction, cardiac CT is becoming an essential diagnostic tool in pediatric CHD. We present our experience in using second-generation dual-source (DS) CT at Vietnam National Children’s Hospital (VNCH) for CHD management, providing some pre-and post-operative cases.

**Methods:** 820 patients (448 males) underwent cardiac DSCT (SOMATOM Definition Flash, Siemens Healthineers) at the Department of Radiology, VNCH from February 2019 to June 2021 under general anesthesia. Prospective ECG triggering was performed for coronary CTA, and Flash mode was performed for cardiac CTA with test bolus.

**Results:** Mean age was 23.6 months (1 day-15 years old), mean height was 73.7 cm (45 – 156), and mean weight was 9.2 kg (2.5 – 43). There were some entities of pre- and post-operative CHD management includes Tetralogy of Fallot, pulmonary atresia, double outlet right ventricular, hypoplastic left heart syndrome, transposition of great arteries, anomalous pulmonary venous return, and coronary artery anomaly.

**Conclusions:** DSCT is a feasible non-invasive imaging tool for pediatric CHD disease management.

**Keywords:** Congenital heart diseases; cardiac CT, dual-source computed tomography, prospective ECG triggering, and coronary artery anomaly.
Speaker

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Education
2002-2009
Odessa State Medical University, Medicine Doctor

Post-Graduate Education
2009-2010
Radiologist, Hanoi Medical University
2019
Visiting fellow in Seoul National University Hospital from June – September
Visiting fellow in Petermac Cancer Center from November – December

Academic Appointments
Professional Affiliations and Scientific Publications

1. Value of Dedicated Head and Neck 18F-FDG PET/CT Protocol in Detecting Recurrent and Metastatic Lesions in Post-surgical Differentiated Thyroid Carcinoma Patients with High Serum Thyroglobulin Level and Negative 131I Whole-body Scan.

2. Diagnostic and prognostic value of 99mTc-MAA SPECT/CT for treatment planning of 90Y-resin microsphere radioembolization for hepatocellular carcinoma: comparison with planar image

3. Relationship between clinicopathologic factors and FDG avidity in radiiodine-negative recurrent or metastatic differentiated thyroid carcinoma

4. Efficacy and safety of selective internal radiation therapy with yttrium-90 for the treatment of unresectable hepatocellular carcinoma
Correlation between diastolic left ventricular mechanical dyssynchrony parameters by gated single-photon emission computed tomography myocardial perfusion imaging and left ventricular echocardiographic indexes in early post-myocardial infarction patients

Mai Hong Son

**Purpose:** The aim of this study is to assess the correlation between LVMD by gated single photon emission computed tomography myocardial perfusion imaging and TSI in early post-myocardial infarction patients

**Retrospective and Prospective study:** The study was conducted on 106 post-myocardial infarction patients and control cohort of 34 patients from January 2015 to January 2019 in Department of nuclear medicine and Diagnostic imaging department, Hospital 108. Left ventricular synchronous parameters of patients and control subjects were measured by using GSPECT MPI and TSI. Abnormal diastolic synchrony was categorized as 2Ds higher than mean of mechanical dyssynchrony parameters. Both dyssynchrony parameters assessed by GSPECT MPI and TSI were correlated.

**Results:** Mean PSD and HBW of PMI cohort were 48.6 ± 19.49 and 154.9 ± 71.9 degree which were significantly higher than those of control cohort, 17.5 ± 7.24 and 53.9 ± 15.14 degree respectively. Ts-Diff 12 and Ts-SD 12 of PMI also were higher than those of control cohort. The abnormal value of PSD and HBW were seen on 77% and 81% patients PMI whereas the prevalence of abnormal Ts-SD12 and Ts-Diff12 was 56.6% and 60.38% in PMI cohort respectively. The correlation coefficient of PSD between Ts-SD12 and Ts-diff12 was 0.57 and 0.64 as the same as HBW between Ts-SD12 and Ts-diff12.

**Conclusion:** Diagnostic LVMD parameters of GSPECT MPI and TSI of PMI cohort were higher than control cohort. Phase analysis on GSPECT MPI showed the moderate correlation with Ts-SD and Ts-Diff on TSI for the assessment of LVMD

**Keywords:** Left ventricular mechanical dyssynchrony, MPI, TSI, correlation, post myocardial infarction
Speaker

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Professional Affiliations and Scientific Publications

Professional Affiliation:
Research Assistant – Heart Failure Clinic UNS Academic Hospital, Surakarta, Indonesia (2019-present)
General Practitioner of UNS Academic Hospital, Surakarta, Indonesia (2019-present)
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Scientific Publications
Supraventricular Tachycardia, Rare Complication of Leptospirosis: A Case Report, Indonesian Journal of Cardiology, 2020: 41-suppl_A
Polycythemia Vera presented with Atrial Flutter and ST segment Elevation with non-obstructive coronary arteries: A Case Report. Jogja Cardiology Update 2020
Novel Intraventricular thrombus of COVID-19 Healthy Heart Patient

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Introduction: Covid-19 became a global burden. Despite the respiratory complication, covid-19 has been known to result in cardiovascular complication by hypercoagulopathy mechanism. Most of the reported case showed patients with intracardiac thrombus had comorbidities such as regional wall abnormality, CAD or heart failure. We present a case of a covid-19 patient with intraventricular thrombus with normal left ventricular function.

Case: A 64-year old male with Covid-19 complained of fever, lethargy and no shortness of breath despite 87% oxygen saturation. Normal ECG and bronchopneumonia from chest x-ray were discovered. Blood investigation showed elevated d-dimer and HS-Troponin level. On the 5th day of hospitalization, the patient felt chest pain. Evolving ST elevation of inferior lead, pathological q wave, and inverted T wave of anterior lead detected in ECG. Left ventricular thrombus attached in IVS, normal RV and LV systolic function, no regional wall and valvular abnormality was discovered on Trans-thoracal echocardiography. CT angiography revealed a large LV thrombus in the left ventricle and no evidence of coronary occlusion.

Discussion: Endothelial dysfunction, hypercoagulable state, and static condition are the main components of thrombus formation. Multiple mechanisms, including inflammation and hypercoagulopathy in Covid-19, induce its formation. The presence of intracardiac thrombus in most of the reported cases are accompanied by cardiac dysfunction. This case report is a piece of evidence that Covid-19 can produce intracardiac thrombus despite the normal function of the heart.
Speaker

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Education:
1989-1991  Department of Pre-Medicine, College of Natural Sciences,

Ulsan University
1991-1995  College of Medicine, Ulsan University (M.D.)
1999-2004  Graduate School, Ulsan University (M.S.)
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Employment and Experience in Academia:
1995-1996  Intern, Asan Medical Center
1996-2000  Resident in Radiology, Asan Medical Center
2000-2003  Army Forces Chenog-pyeong Hospital, Department of Radiology
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2003-2004  Clinical Fellow in Radiology,
           Seoul National University Bundang Hospital
2004-     Assistant Professor, Department of Radiology
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2008.2-2009.1  Research fellow, Division of Cardiology
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2012-     Associate Professor, Department of Radiology
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License and Certification
1995  Korean Medical License
2000  Korean Board of Radiology
Awards

1. “Certificate of Merit” with “MRI of Myocardial Infarction” Exhibited at the 55th Scientific Assembly and Annual Meeting of the Korean Society of Radiology, Seoul. (First Author)


3. “Academic Award” by the Korean Society of Radiology with “Irreversibly damaged myocardium at MR imaging with a necrotic tissue-specific contrast agent in a cat model” (Radiology 2000;215:863-868). (First Author)


5. “Best Scientific Exhibition Award: Gold” with “Coronary CT Angiography: Hype or New Paradigm? - focused on new algorithm as diagnostic tool in a routine clinical practice” Exhibited at the 62th Scientific Assembly and Annual Meeting of the Korean Society of Radiology, Seoul. (First Author)
Feature tracking computed tomography-derived left ventricular strain: impact according to slice thickness of the reconstructed image

Sang Il Choi

**Purpose:** To assess the clinical feasibility of variant thickness CT image-derived myocardial strain as well as to validate its agreement with 1mm thickness CT image-derived myocardial strain.

**Retrospective and Prospective study:** Total 20 patients with stable heartbeat were included in this analysis. For all patients, CT data were acquired from a third generation dual source CT system. Additional functional reconstructions for dynamic assessment and quantification of LV myocardial strain were created with novel feature tracking software (Medis suite CT v3.2, The Netherlands). Correlations between 1mm and other thickness CT image-derived strain were analyzed Pearson’s or Spearman’s correlation coefficient. Agreement between the measurements of LV myocardial strain derived from two different thickness images was assessed using Intraclass Correlation Coefficient (ICC).

**Results:** The mean age of all 20 patients was 60 ± 12. Mean 1mm thickness CT image-derived LV longitudinal, radial, circumferential strain was -20.56±3.22, 50.43 ± 8.33, and -25.41 ± 2.87, respectively. Variant thickness CT image-derived LV longitudinal, circumferential strain were similar regardless of the thickness. However, the radial strain increased by the thickness. While mean values were not identical, close correlation was found between 1 and 2, 3, 4, 6mm thickness CT image-derived strain measurements (except for radial 1-3mm). (Long1 vs 2,3,4,6mm (r ≥0.6, p <0.05). Rad1 vs 2,4mm (r≥0.5, p<0.05), Cir1 vs 2,3,4,6mm (r≥0.7, p ≤0.001)). On ICC analysis, 1mm thickness CT image-derived LV myocardial strain showed high agreement with other thickness CT image-derived LV myocardial strain (Longitudinal (1 vs 2,3,4,6mm : ICC ≥ 0.7, p <0.05), Radial (1vs 2,4mm : ICC ≥ 0.6, p <0.05), Circumferential (1 vs 2,3,4,6mm : ICC ≥0.8, p ≤0.001)).

**Conclusion:** Assessment of LV myocardial strain from variant thickness CT image is feasible. In particular, longitudinal and circumferential strain are consistent regardless of the thickness while radial strain is overestimated from above 3mm thickness images.

**Keywords:** Cardiac computed tomography, Feature tracking, Myocardial deformation, Strain
Speaker

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Education
From 2012 to 2015: Student at Bao Loc High School
From 2016 to now: Medical student at Universiry of Medicine and Pharmacy at Ho Chi Minh City (UMP, HCMC)

Awards:
Title of “Student of Five Merits” (2017, 2018, 2019, 2020) awarded by UMP.
Title of “Blouse trang lam theo loi Bac” (2017,2018, 2019, 2020) awarded by UMP.

Academic Appointments
Tutor of the Program named IMPACT MED Alliance (Improving Access Curriculum and Teaching in Medical education and Emerging Diseases Alliance) from 2018 to 2020.

Professional Affiliations and Scientific Publications

Co-author of the article: "COVID-19: Experience from Vietnam Medical Students". DOI: 10.5195/ijms.2020.505

Co-author of the article: "Cluster analysis of epidemiological characteristic features of confirmed cases with the novel coronavirus (COVID-19) outside China: a descriptive study". DOI: 10.1101/2020.06.28.20142000
Severe pulmonary arterial hypertension with haemoptysis in adults caused by patent ductus arteriosus. The diagnostic approach and treatment strategy

Nguyen Hoang Dung

Pulmonary hypertension (PH) is a complex pathophysiological condition characterized by increased pressure in the pulmonary circulation. Patients with PH tend to present with nonspecific cardiovascular and respiratory symptoms [2]. Hemoptysis is a rare complication of pulmonary hypertension that represents about one to 6% of this situation[12]. Even though, it can lead to the deterioration of the patient's condition. It also can be life-threatening with rate up to 50% when massive hemoptysis patients without responding to appropriate therapies[7, 8].

World Health Organization (WHO) established a clinical categorization scheme that divides pulmonary hypertension into five categories based on mentioned pathophysiology and treatment[3]

Although frequency of patent ductus arteriosus is reported as 5-10% of all congenital heart defects, patent ductus arteriosus in adulthood is not often encountered since it is usually discovered and treated during childhood[5]. Left untreated, patent ductus arteriosus can lead to pulmonary hypertension, Eisenmenger syndrome, heart failure and endarteritis[12]. There are many kinds of treatment for pulmonary arterial hypertension caused by patent ductus arteriosus including medical therapy, transcatheter closure and surgery. Nevertheless, there are not a variety of reports about transcatheter occlusion of patent ductus arteriosus in patients with pulmonary arterial hypertension having a bidirectional shunt. Therefore, taking the opportunity to encounter a rare case of hemoptysis in adults with severe PAH-induced PDA with a bidirectional shunt, we present the approach and treatment strategy in this report.

Keyword: pulmonary hypertension, haemoptysis, patent ductus arteriosus, right heart catheterization, transcatheter closure
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**Education**

2004 – 2010: Medical student in Ha Noi Medical University, Ha Noi, Viet Nam; Qualification: Good.

**Post-Graduate Education**

2010 -2013: Resident doctor in Ha Noi Medical University and Radiology Department – University Hospital, Viet Duc University Hospital, Ha Noi, Viet Nam; Qualification: Good.  
2014 – Present: Radiologist at Radiology Department - Bach Mai Hospital, Ha Noi, Viet Nam, concentrate to cardiovascular radiology.

**Academic Appointments**

2010 -2013: Resident doctor in Ha Noi Medical University and Radiology Department – Bach Mai Hospital, Viet Duc University Hospital, Ha Noi, Viet Nam.  
2018-2020: Specialist doctor level 2 in Ha Noi Medical University and Radiology Centre – Bach Mai Hospital, Ha Noi, Viet Nam.

**Professional Affiliations and Scientific Publications**

2014: Accuracy of dual-source computed tomography coronary angiography for evaluation of coronary artery disease. 
2020: Diagnosis of coronary artery fistulas by multidetector computed tomography.
Diagnosis of coronary artery fistulas by multi detector computed tomography

Phung Bao Ngoc¹, Nguyen Khoi Viet¹, Nguyen Ngoc Trang¹, Hoang Van Hoa¹, Le Thuy Lien¹, Vu Dang Luu¹, Pham Minh Thong¹

¹ Radiology Centre, Bach Mai hospital, Hanoi, Vietnam

Objective: To evaluate the imaging characteristics of coronary artery fistulas (CAF) by multidetector computed tomography (MDCT).

Methods: a prospective descriptivistudy from January 2019 to September 2020 enrolled 31 patients (11 males, mean age 56 years) detected CAFs on MDCT at Radiology Centre of Bach Mai hospital. The origin, size, and drainage site of CAFs were analyzed.

Results: 31 (0.93%) CAFs were detected with 3322 patients underwent CCTA. 18 (58.1%) patients had multiple fistulas and 13 (41.9%) patients had single communication. 6.5% originated from the right coronary, 35.5% from the left coronary artery system, and 58.5% from both the right and left coronary artery. 87.1% of fistulas drain to the right side of the circulation (74.2% drain to pulmonary artery). 1 patient (3.2%) had fistula drain to the left side of the circulation (bronchial artery). 3 patients (9.7%) had fistulas drain to both the right and left side of the circulation (pulmonary artery and bronchial artery). 10 patients had large fistulas (32.3%), 21 patients had small fistulas (67.7%). 19 (61.3%) patients had an associated aneurysm of fistulas. 38.7% of cases were diagnosed with CAFs by echocardiography (38.7%). 6 patients were examined by CAG: 2 patients were not detected origin of fistulas by CAG, 3 patients were not detected drainage of fistulas by CAG.

Conclusion: DSCT is a noninvasive and useful modality for the diagnosis of CAFs.

Keywords: Coronary artery fistula, MDCT.
**Scientific Session 2**

**Chairperson(s)**

Dr. Nguyen Khoi Viet (VNM)  
Dr. Jacob Pandelaki (IDN)

**Speaker/Lecturers**

- Akio Inage (JPN)  
- Oktavia Lilyasari (IND)  
- Yanyan Song (CHN)  
- Baiyan Zhuang (CHN)  
- Phung Bao Ngoc (VNM)  
- Di Zhou (CHN)  
- Sang Il Choi (KOR)  
- Akio Inage (JPN)  
- Elen (IND)

**Day 1 - August 19 (Thursday) / Channel 3**

16:00 - 17:30 (GMT + 7)

**16:00**  
Native hepatic T1 may be a potential marker for liver fibrosis in Fontan patients  
Akio Inage (JPN)

**16:10**  
The Role of Cardiac Magnetic Resonance Imaging in Congenital Heart Disease: Single Center Experience  
Oktavia Lilyasari (IND)

**16:20**  
Early left ventricular diastolic dysfunction and abnormal left ventricular-left atrial coupling in asymptomatic patients with hypertension: a cardiovascular magnetic resonance feature tracking study  
Yanyan Song (CHN)

**16:30**  
Left Ventricular Strain Can Predict Outcomes of Pulmonary Valve Replacement in Patients with Repaired Tetralogy of Fallot  
Baiyan Zhuang (CHN)

**16:40**  
Evaluation of myocardium injury on cardiac magnetic resonance imaging in patients with re-perfused acute myocardial infarction  
Phung Bao Ngoc (VNM)

**16:50**  
Cardiovascular Magnetic Resonance Characteristics, Gene Variants and Clinical Implications in Patients with Left Ventricular non-compaction Cardiomyopathy  
Di Zhou (CHN)

**17:00**  
Circumferential Transmural Strain Difference in Patients with Apical Hypertrophic Cardiomyopathy: Assessment with Feature Tracking Cardiac Magnetic Resonance  
Sang Il Choi (KOR)

**17:10**  
Usefulness of non-contrast-enhanced angiography for congenital heart disease by SSFP radial scan  
Akio Inage (JPN)

**17:20**  
The Role of Cardiovascular Magnetic Resonance Imaging in The Diagnosis of Arrhythmogenic Right Ventricular Cardiomyopathy  
Elen (IND)
Education
1982 Graduated from Gyosei High School (Tokyo, Japan)
1984-1988 Chuo University Faculty of Science and Engineering, Tokyo, Japan
1988-1994 Teikyo University School of Medicine, Tokyo, Japan

Academic Appointments
2020-present
Chief Physician, Department of Pediatrics, Japanese Red Cross Medical Center, Tokyo, Japan
2000-2003, 2010-2020
Senior Resident and Staff Physician, Division of Pediatric Cardiology, Sakakibara Heart Institute, Tokyo, Japan
Clinical and Research Fellow, Division of Paediatric Cardiology, The Hospital for Sick Children, University of Toronto, Ontario, Toronto, Canada
2006-2008
Clinical and Research Fellow, Division of Pediatric Cardiology, University of Alberta, Stollery Children’s Hospital, Alberta, Edmonton, Canada

Professional Affiliations and Scientific Publications
   Clinical Evaluation for Myocardial Dysfunction in Right Ventricular Heart Disease Assessed by Feature Tracking MR Strain.
   Direct measurement of aortic regurgitation with phase-contrast magnetic resonance is inaccurate: proposal of an alternative method of quantification.
3. Takahashi K, Inage A, Rebeyka IM, Ross DB, Thompson RB, Mackie AS,
Smallhorn JF. Circulation. 2009 Sep 22;120(12):1091-8.
Real-time 3-dimensional echocardiography provides new insight into mechanisms of tricuspid valve regurgitation in patients with hypoplastic left heart syndrome.

Native hepatic T1 may be a potential marker for liver fibrosis in Fontan patients

Akio Inage

**Introduction:** Native T1, a marker of tissue remodeling, can be initially quantified for the myocardium using T1 mapping with cardiac magnetic resonance (CMR). We hypothesized that native hepatic T1 could also be quantified in patients with Fontan palliation, and provide a means of assessing liver health.

**Objective:** To evaluate T1 mapping for diagnosis and grading of liver fibrosis in patients with Fontan palliation.

**Methods:** Using the SIEMENS MAGNETON Sola 1.5T scanner, Fontan patients prospectively underwent CMR, including native T1 mapping of the myocardium in a single short axis plane. A portion of liver was contoured to quantify T1. Hepatic native T1 was measured between comparison groups with healthy control subjects (n=9) who had previously undergone CMR imaging.

**Results:** 5 Fontan patients participated (mean age 11.7 ± 10.5 years, 4 [75%] female). Mean native hepatic T1 for Fontan patients was 690.6 ± 28.9 ms, and significantly higher than healthy control subjects (565.1 ± 25.3 ms, p<0.01 by ANOVA). Among Fontan patients, native hepatic T1 strongly correlated with rate of change from myocardial T1 to hepatic T1 (hepatic T1/myocardial T1) (r=0.92), and weakly correlated with liver fibrosis marker (r=0.57 for M2BPGi, r=0.5 for type 4 collagen).

**Conclusion:** Native hepatic T1 can be measured by T1 mapping already obtained for myocardial T1 measurement and is significantly higher in Fontan patients compared to healthy control subjects. Native hepatic T1 may be an alternative method of following fibrosis burden, though its significance requires further study.
Speaker

Oktavia Lilyasari

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Education

1. General Practitioner: Faculty of Medicine Universitas Indonesia, Jakarta, Indonesia
2. Master of Health Science in Clinical Epidemiology and Biostatistic Unit: Faculty of Medicine University Gadjah Mada Yogyakarta, Indonesia
3. Cardiologist: Faculty of Medicine Universitas Indonesia, Jakarta, Indonesia

Post-Graduate Education

1. Fellowship in Pediatric Cardiology and Congenital Heart Disease: National Cardiovascular Center Harapan Kita Jakarta-Indonesia
2. Training in Cardiac Magnetic Resonance Imaging in Congenital Heart Disease, Heart and Diabetes Center, Bad Oeynhausen- Germany
3. Fellowship in Pediatric Cardiology and Congenital Heart Disease Imaging: National Cardiovascular Center Harapan Kita Jakarta-Indonesia

Academic Appointments

Head of Pediatric and Congenital Heart Disease Division
Department Cardiology and Vascular Medicine Universitas Indonesia
National Cardiovascular Center Harapan Kita Jakarta-Indonesia

Professional Affiliations and Scientific Publications

Indonesian Heart Association

Publication

The Role of Cardiac Magnetic Resonance Imaging in Congenital Heart Disease: Single Center Experience

Oktavia Lilyasari, Anna U Rahajoe, Poppy S Roebiono, Radityo Prakoso, Yovi Kurniawati, Olfi Lelya, Sisca Natalia, Indriwanto Sakidjan, and Ganesja M Harimurti

Department of Cardiology and Vascular Medicine
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National Cardiovascular Center Harapan Kita, Jakarta, Indonesia

Introduction: Cardiac Magnetic Resonance Imaging (CMRI) is an important non-invasive imaging modality for congenital heart disease (CHD), and recently established as a new adjunctive technique at our center alongside echocardiography and cardiac catheterization. The aim of this study is to review the clinical indications of CMRI in CHD at tertiary center in Indonesia.

Methods: From January 2013 to July 2019, a total of 1420 CHD patients (median age 213 months, 19-1414 months, 61.06% women) underwent CMRI examination at National Cardiovascular Center Harapan Kita Jakarta-Indonesia. CMRI was performed using Philips Medical System 1,5T Scanner. The acquisition protocols consist of the ECG gated cine steady state free precision (SSFP), velocity-encoded phase contrast for quantitative blood flow measurement, and the administration of Gadolinium contrast agent for angiography evaluation.

Result: We experienced technical difficulties and lack of anesthesia facilities, besides the short-axis ECG gated cine SSFP sequence for function evaluation purposes, all the sequences were performed with free breathing. No sedation was performed. Anatomy and morphology characterization, flow ratio (Qp/Qs), volume and function quantification and fibrosis evaluation were the reasons for examination. Clinical indications include ASD (15.92%), Tetralogy of Fallot (TOF)/Pulmonal Atresia (10.99%), VSD (7.61%), Myocarditis (4.79%), Ebstein Anomaly (4.23%), Pulmonary Regurgitation (3.03%), Double Chamber Right Ventricle (1.9%), PDA (1.83%), DORV (1.62%), valvar PS (1.55%). It also used for post-operative evaluation such as TOF’s repair (4.23%), BCPS (3.24%), Fontan procedure (2.54%), valve repair (1.62%) Rastelly procedure (1.27%), BT Shunt (0.63%)

Conclusion: The use of CMRI in CHD depends on age, clinical condition, and diagnostic purpose. Inability with breath holding command, lack of patient’s cooperation and anesthesia facilities, are the reasons CMRI can only be done in older children, adolescents or adults in our center.

Keywords: Cardiac Magnetic Resonance Imaging- Congenital Heart Disease-Indonesia
Early left ventricular diastolic dysfunction and abnormal left ventricular-left atrial coupling in asymptomatic patients with hypertension: a cardiovascular magnetic resonance feature tracking study

Yanyan Song

Purpose: Patients with hypertension (HTN) have an increased risk of left ventricular (LV) diastolic dysfunction and LV hypertrophy (LVH). Accurate noninvasive diagnostic tools were needed to evaluate early LV diastolic function. The aim of this study was to evaluate whether cardiovascular magnetic resonance feature-tracking (CMR-FT) could detect early LV dysfunction, and evaluate LV-LA correlation in HTN patients.

Methods: Eighty-nine HTN patients and 38 age- and gender-matched controls were enrolled and underwent CMR examination. HTN patients were divided into LVH (n=38) and non-LVH (n=51) groups. All LV deformation parameters were analyzed in radial, circumferential and longitudinal directions, including peak strain (PS), peak systolic strain rate (PSSR) and peak diastolic strain rate (PDSR). LA strain and strain rate (SR), including LA reservoir function (εs,SRs), conduit function (εe,SRε) and booster pump function (εa,SRa) were also analyzed. Spearman analysis, receiver operating characteristic curve and intra-class correlation coefficient analysis were used for statistical analyses.

Results: Compared with controls, the LV PDSR in radial, circumferential and longitudinal directions and the LA reservoir and conduit function were significantly impaired in HTN patients regardless of LVH (all P<0.05). Among all LV deformation parameters, LV longitudinal PDSR showed the highest diagnostic values to discriminate HTN patients without LVH with controls with an AUC of 0.70 (specificity 79%, sensitivity 55%). The LV longitudinal and radial PDSR showed significantly correlation with LA reservoir and conduit function (all P<0.01).

Conclusions: CMR-FT could detect early LV diastolic dysfunctional in HTN patients, which might be associated with LA reservoir and conduit dysfunction.
Left Ventricular Strain Can Predict Outcomes of Pulmonary Valve Replacement in Patients with Repaired Tetralogy of Fallot

Baiyan Zhuang

**Background:** Pulmonary valve replacement (PVR) is effective in reducing the right ventricular volume and retaining right ventricular function in patients with repair tetralogy of Fallot (rTOF). However, prognostic outcomes after PVR surgery are still mixed. Key factors that determine outcomes after PVR in rTOF patients are largely unknown. Our study aims to analyze whether pre-PVR strain and strain rate are associated with long-term outcomes after PVR in patients with rTOF.

**Method:** This prospective study enrolled 41 asymptomatic rTOF patients who required PVR due to moderate or severe pulmonary regurgitation. The feature tracking parameters were measured pre-operatively based on cine sequences. Adverse events including death due to any cause, cardiac transplantation, syncope caused by arrhythmias, redo PVR, symptomatic heart failure and persistence ventricular tachycardia were documented during follow-up. ROC analysis was performed and Kaplan-Meier curves were drawn with log-rank statistics.

**Result:** During 3.0±1.5 years of follow-up, 10 adverse events were recorded. The 3-year event-free survival rate was 63% for patients with a pre-operative radial strain (RS)>23.87% (p<0.001), 93% for patients with a pre-operative circumferential strain (CS)<-15.55% (p<0.001), 63% for patients with a pre-operative longitudinal strain(LS)<-9.7% (p<0.001). As for strain rate, the 3-year event-free survival rate was 68% for patients with a pre-operative systolic radial strain rate (RSRs) >1.53s-1 (p=0.003), 68% for patients with a pre-operative early diastolic radial strain rate (RSRe) <-1.73 s-1 (p<0.001) and 59% for patients with a pre-operative early diastolic longitudinal strain rate (LSRe) >0.42 s-1 (p<0.001).

**Conclusion:** The RS, CS, LS, RSRs, RSRe, LSRe before PVR are important prognostic factors for adverse events. Identifying these factors can help recognize patients at increased risk of adverse events.

**Key words:** TOF, CMR feature tracking, strain
Evaluation of myocardium injury on cardiac magnetic resonance imaging in patients with re-perfused after acute myocardial infarction

Phung Bao Ngoc
Radiology Centre, Bach Mai hospital, Hanoi, Vietnam

Objective: To access the imaging characteristics of the myocardium injury on cardiac magnetic resonance imaging (MRI) in reperfused acute myocardial infarction (MI) after percutaneous coronary revascularization.

Methods: 50 patients with Acute Myocardial Infarction (90% STEMI) underwent cardiac MRI with Cine sequence and Delayed Contrast Enhancement within 9 days after percutaneous coronary revascularization at Bach Mai Hospital. Left ventricular function and extent of infarction, infarct size were analyzed.

Results: The sensitivity of delay- contrast enhancement for detecting MI was 98%. The accuracy of MRI for identifying MI location (compared with infarct-related artery perfusion territory) was 90%, kappa=0.804 with all the patients and was 95.6%, kappa=0.904 with STEMI. The infarcted areas in 49 patients were detected by use of cardiac delayed-enhancement MRI. There was an excellent correlation between quantitative planimetry and scoring method for the hyperenhancement infarct size (r = 0.975, p < 0.0001). Infarct size on delayed-enhancement showed a good negative correlation with left ventricular ejection fraction (r = -0.628 with planimetry method, r = -0.598 with the scoring method).

Conclusion: Cardiac MRI is feasible for evaluating myocardium injury in patients with re-perfused after acute myocardial infarction

Keywords: Cardiac MRI, Acute Myocardial Infarction, Delayed Contrast Enhancement.
Cardiovascular Magnetic Resonance Characteristics, Gene Variants and Clinical Implications in Patients with Left Ventricular non-compaction Cardiomyopathy

Di Zhou

Objective: To investigate the CMR characteristics and genotype-CMR-phenotypic expression correlation in patients with LVNC, and to explore additional value for follow-up by CMR imaging if possible.

Materials & Methods: Patients with LVNC who underwent CMR and targeted gene sequencing between 2006 and 2016 were evaluated. Pathogenicity of the detected variants was determined according to American College of Medical Genetics and Genomics recommendations and their prevalence. Left ventricular morphologic, functional and subsequent feature tracking analysis were evaluated by CMR balanced steady-state free precession cine images. Myocardial late gadolinium enhancement was identified by using a gradient spoiled fast low-angle shot sequence. The primary endpoint was a composite of all-cause death, heart transplantation and cardiovascular death, including heart failure-related death, sudden cardiac death and death from other cardiovascular causes.

Results: A total of 30 LVNC patients of which 16 cases with G+ (mean age: 40.9 years ± 14.7) and 14 cases with G- (mean age: 40.0 years ± 18.2) were evaluated. There was no significant difference between these two groups for the LV volumetric and morphological parameters as well as LGE. Lower longitudinal strain values for the G+ groups were observed, on the both global and regional level, compared with G- cases. (Global: -10.6%±3.8 vs. -14.4%±6.0, p=0.045; 3-chamber: -8.5% (-13.0, -6.1) vs. -13.8% (-19.5, -11.0), p=0.03; 4-chamber: -9.2% (-11.6, -7.4) vs. -15.4% (-18.6, -8.8), p=0.03, respectively). And increased risks of primary endpoints were observed in individuals with LV decreased strain/strain rate, dilation, systolic dysfunction and fibrosis (all p<0.05).

Conclusion: Genotype-positive status patients with LVNC showed more impaired longitudinal strain by CMR-FT. CMR is a promisingly robust imaging method to diagnosis myocardial non-compaction, assess the severity of disorder, and predict outcomes in LVNC.
Speaker
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Education:
1989-1991 Department of Pre-Medicine, College of Natural Sciences,
Ulsan University
1991-1995 College of Medicine, Ulsan University (M.D.)
1999-2004 Graduate School, Ulsan University (M.S.)
2005-2007 Graduate School, Ulsan University (Ph.D.)

Employment and Experience in Academia:
1995-1996 Intern, Asan Medical Center
1996-2000 Resident in Radiology, Asan Medical Center
2000-2003 Army Forces Chenog-pyeong Hospital, Department of Radiology
(Mandatory Military Service)
2003-2004 Clinical Fellow in Radiology,
Seoul National University Bundang Hospital
2004- Assistant Professor, Department of Radiology
Seoul National University Bundang Hospital
Seoul National University School of Medicine
2008.2-2009.1 Research fellow, Division of Cardiology
Department of Internal Medicine, Johns Hopkins Medicine
2012- Associate Professor, Department of Radiology
Seoul National University Bundang Hospital
Seoul National University School of Medicine

License and Certification
1995 Korean Medical License
2000 Korean Board of Radiology
**Awards**

1. “Certificate of Merit” with “MRI of Myocardial Infarction” Exhibited at the 55th Scientific Assembly and Annual Meeting of the Korean Society of Radiology, Seoul. (First Author)


3. “Academic Award” by the Korean Society of Radiology with “Irreversibly damaged myocardium at MR imaging with a necrotic tissue-specific contrast agent in a cat model” (Radiology 2000;215:863-868). (First Author)


5. “Best Scientific Exhibition Award: Gold” with “Coronary CT Angiography: Hype or New Paradigm? - focused on new algorithm as diagnostic tool in a routine clinical practice” Exhibited at the 62th Scientific Assembly and Annual Meeting of the Korean Society of Radiology, Seoul. (First Author)
Circumferential Transmural Strain Difference in Patients with Apical Hypertrophic Cardiomyopathy: Assessment with Feature Tracking Cardiac Magnetic Resonance

Sang Il Choi
Associate Professor, Department of Radiology Seoul National University, College of Medicine Seoul National University Bundang Hospital

**Purpose**: The purpose of our study was to explore both whether cTSD differentiates ApHCM and its relationship with other anatomical and functional markers.

*Retrospective and Prospective study*: A retrospective, single-center, case control study was conducted in patients with ApHCM who underwent 1.5T or 3.0T cardiac MRI. The cTSD was calculated by the difference between epicardial and endocardial circumferential strain. We compared the global and segmental strain between groups, and analyzed correlations between cTSD and LV mass or late gadolinium enhancement (LGE).

**Results**: A total of 29 subjects (17 ApHCM, median 64 years, 71% men; 12 normal control, median 55 years, 67% men) were evaluated. Global as well as segmental cTSD were significantly higher in the ApHCM group than normal from base to apex, the differences being greatest at apex (base 19.6% vs 16.1%, mid 24.5% vs. 16.9%, apex 36.8% vs 21.6%, all P<0.05). Global cTSD showed a moderate positive correlation with indexed LV mass (ρ=0.599, P=0.001); segmental cTSD, a weak positive correlation with LGE in ApHCM patients (ρ=0.239, P<0.001).

**Conclusion**: All the segmental cTSD was significantly higher in ApHCM than normal, the greatest difference at apical segments, which was not seen in the full-thickness myocardial circumferential strain.

**Keywords**: Cardiac magnetic resonance, Feature tracking, Myocardial deformation, Strain
Speaker

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Education
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1984-1988 Chuo University Faculty of Science and Engineering, Tokyo, Japan
1988-1994 Teikyo University School of Medicine, Tokyo, Japan

Academic Appointments
2020-present
Chief Physician, Department of Pediatrics, Japanese Red Cross Medical Center, Tokyo, Japan
2000-2003, 2010-2020
Senior Resident and Staff Physician, Division of Pediatric Cardiology, Sakakibara Heart Institute, Tokyo, Japan
Clinical and Research Fellow, Division of Paediatric Cardiology, The Hospital for Sick Children, University of Toronto, Ontario, Toronto, Canada
2006-2008
Clinical and Research Fellow, Division of Pediatric Cardiology, University of Alberta, Stollery Children’s Hospital, Alberta, Edmonton, Canada

Professional Affiliations and Scientific Publications
Clinical Evaluation for Myocardial Dysfunction in Right Ventricular Heart Disease Assessed by Feature Tracking MR Strain.
Direct measurement of aortic regurgitation with phase-contrast magnetic resonance is inaccurate: proposal of an alternative method of quantification.
3. Takahashi K, Inage A, Rebeyka IM, Ross DB, Thompson RB, Mackie AS,
Smallhorn JF. Circulation. 2009 Sep 22;120(12):1091-8.
Real-time 3-dimensional echocardiography provides new insight into
mechanisms of tricuspid valve regurgitation in patients with hypoplastic left
heart syndrome.

Usefulness of non-contrast-enhanced angiography for congenital heart disease by SSFP radial scan

Akio Inage
Speaker

Elen

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Departement of Cardiology and Vascular Medicine,
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National Cardiovascular Center Harapan Kita -
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Education
- Cardiologist: Department of Cardiology & Vascular Medicine, Faculty of Medicine Universitas Indonesia

Post-Graduate Education
- 11th CT Coronary Angiography Teaching Course, Singapore 2014
- CSI Focus Imaging – CT for LAA closure, Germany, 2017
- CT Imaging for Transcatheter Aortic Valve Implantation Course, Germany, 2017
- SCMR Level III Competence in Cardiovascular Magnetic Resonance, Germany, 2018
- EACVI Level III Competence in Cardiovascular Magnetic Resonance, Germany, 2018
- Nuclear Cardiology & Cardiovascular Imaging (Cardiac Nuclear, CT & MR), National Cardiovascular Center Harapan Kita, Jakarta

Academic Appointments
Clinical Teacher - Department of Cardiology & Vascular Medicine, Faculty of Medicine Universitas Indonesia

Professional Affiliations and Scientific Publications
Professional Affiliation:
- Indonesian Heart Association
- Indonesian Society of Cardiovascular Imaging

Scientific Publication:
- A rare case of superior vena cava lipoma: Its presentation from non-invasive examination. European Heart Journal Cardiovascular Imaging, 2019, 20(10), pp. 1183
- Native T1 and ECV of Noninfarcted Myocardium and Outcome in Patients With Coronary Artery Disease. Journal of the American College of Cardiology, 2018, 71(7), pp. 766–778
The Role of Cardiovascular Magnetic Resonance Imaging in The Diagnosis of Arrhythmogenic Right Ventricular Cardiomyopathy

Elen
Departement of Cardiology and Vascular Medicine, Faculty of Medicine Universitas Indonesia, National Cardiovascular Center Harapan Kita - Jakarta, Indonesian Heart Association

Introduction: Arrhythmogenic right ventricular cardiomyopathy (ARVC) is an inherited cardiomyopathy that can lead to sudden cardiac death and heart failure. The diagnosis of ARVC remains particularly challenging due to the absence of specific unique diagnostic. The studies have shown that ARVD is present in up to 20% of individuals who experience sudden cardiac death (SCD) and is even more common among athletes who die suddenly. Cardiovascular magnetic resonance (CMR), with its high spatial resolution and tomographic imaging capability, helps to confirm diagnosis of ARVC.

Clinical report: A 42-years-old man had palpitation and history of syncope. Ventricular tachycardia was documented with left bundle branch block with superior axis, originated from apical RV (Figure 1). Resting electrocardiography demonstrated Epsilon wave at V1-V2 and T inversion at V2-V6 (Figure 2). Echocardiography showed RV hypokinetic with decreased of systolic function, RVOT diameter of 42 mm (PSAx view) and 58 mm (PLA view). MRI findings showed increased RV volume (RVEDVi > 110ml/m2) with severe systolic dysfunction (RVEF 30%), dyskinetic at basal septal, akinetic at apex, basal RV and hypokinetic at other part of RV; fatty infiltration at septal RVOT, interventricular septal, and apex LV-RV (Figure 3); epicardial LGE at basal-apico inferior segments, mid-apico lateral segments and intramyocardial LGE at basal- mid anteroseptal segments (Figure 4). Therefore this patient have > 2 major criteria of 2010 revised Task Force Criteria for ARVC, then Implantable Cardioverter Defibrillator (ICD) was implanted in this patient.

Discussion: ARVC is a genetic cardiomyopathy that is usually autosomal dominant with variable penetrance and expression. The prevalence of ARVC is estimated 1:1000-5000. There is a male predilection, with a male-to-female ratio 3:1. The presenting symptoms include palpitations, syncope and sudden death. The incidence of sudden death decreases after the fourth decade. ARVC is diagnosed based on clinical and paraclinical criteria, including family history. The diagnostic criteria were revised in 2010 and are subdivided in to major and minor criteria. CMR is a specific technique for assessing the morphology and segmental wall motion of the right ventricle. The assessment requires a deep knowledge of the images of normal RV images as well as those of abnormalities suggestive of ARVC.

Patients with episodes of sustained VT or VF, unexplained syncope, non-sustained VT on non- invasive monitoring, extensive disease including those with LV involvement
and good functional
status potential also candidates for ICD implantation. Additionally, the patients with
familial history of sudden death or with genotypes of ARVC associated with a high risk
for SCD should be considered as possible candidates for ICD therapy.

*Keywords*: cardiovascular magnetic resonance, arrhythmogenic right ventricular
cardiomyopathy
DAY 2 – AUGUST 20 (FRIDAY) / CHANNEL 3

16:00 - 17:30 (GMT + 7)

Scientific Session 3

Chairperson(s)

Dr. Nguyen Truong Giang (VNM)  
Dr. Oraporn See (THA)

Speaker/Lecturers

Pan Pan Ng (HKG)  
Ingrid Maria Pardede (IND)  
Nguyen Thanh Van (VNM)  
Vu Thu Thuy (VNM)  
Nguyen Thi Huyen (VNM)  
Tran Huu Nghi (VNM)

16:00  Enhancing Mass in Left Atrial Appendage - Common Pathology in Uncommon Location  
Pan Pan Ng (HKG)

16:10  A rare case of isolated right ventricular non-compaction  
Ingrid Maria Pardede (IND)

16:20  Cardiac cysticercosis on magnetic resonance imaging  
Nguyen Thanh Van (VNM)

16:30  Asymptomatic right ventricle cavernous hemangioma: A case report  
Vu Thu Thuy (VNM)

16:40  Acute myocardial infarction in patient with single coronary artery: a case report  
Nguyen Thi Huyen (VNM)

16:50  Double atrial septum  
Tran Huu Nghi (VNM)
Enhancing Mass in Left Atrial Appendage - Common Pathology in Uncommon Location

Pan Pan Ng

**Introduction:** Cardiac haemangiomas are rare primary benign cardiac tumours. Patients are often asymptomatic and the tumours are discovered incidentally.

**Clinical report:** An asymptomatic 50-year-old lady had incidental finding of a heterogeneously enhancing mass in left atrial appendage (LAA) on computer tomography (CT). She had known history of hepatic haemangiomas.

Cardiac magnetic resonance (CMR) showed a 4.4cm well-defined intraluminal mass within the LAA. The mass was T1W isointense and T2W hyperintense as compared to myocardium. It showed increased perfusion, gradual increase in enhancement and avid homogenous delay enhancement. The tumour signals on T1W, T2W, early and late enhancement sequences followed the known hepatic haemangiomas in the scan range. Features are highly suspicious of cardiac haemangioma.

Surgery for histological diagnosis and treatment was discussed. Patient preferred conservative management with follow up imaging in view of benign diagnosis, the lack of symptoms and high operative risks.

Discussion: Histologically, cardiac haemangiomas are similar to haemangiomas in other body parts. Cardiac haemangioma coexisting with haemangiomas elsewhere is uncommon. While most patients are asymptomatic, coronary insufficiency, heart failure or arrhythmia can occur. Treatment can be conservative or surgical, depending on symptoms and tumour complexity. Non-invasive imaging aims diagnosis and decision making.

CT and CMR are superior in tissue characterization. High T2W signal, high tumour vascularity and heterogenous arterial enhancement with delay filling are the typical features reported in literature. Matching of signal and enhancement pattern across different MR sequences between the cardiac and hepatic haemangiomas in our case provides additional important diagnostic clue, which is not described in previous literature.

Keywords: Cardiac haemangioma. Benign cardiac tumour. CMR
Speaker

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Advanced Echocardiography Fellowship training at National Cardiovascular Center Harapan Kita Jakarta, Indonesia
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Post-Graduate Education

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Academic Appointments

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Acute Changes on Pulmonary Pressure Following Percutaneous Secundum Atrial Septal Defect Closure. Acta Cardiologia Indonesiana (Vol.3 No.2) 2017 (supplement): S12
A rare case of isolated right ventricular non-compaction

Mira Yuniarti¹, Ingrid Maria Pardede², Nathania Victoria Stevina³

¹ Department of Radiology Pelita Harapan University-Siloam Hospitals Denpasar Bali.
² Department of Cardiology Pelita Harapan University-Siloam Hospitals Lippo Village Tangerang.
³ Faculty of Medicine Pelita Harapan University.

Introduction: Non-compaction of ventricular myocardium (NCVM) is a rare genetic condition caused by endomyocardial development arrest. Left ventricle (LV) is the most common site of NCVM, with very rare involvement of the right ventricle. Cardiac MRI (CMR) has an essential role in diagnosing isolated right ventricular non-compaction (IRVNC). We present a rare case of IRVNC confirmed by CMR.

Clinical report: A 64-year-old female presented with history of syncope, progressive dyspnea on exertion and orthopnea for the past 2 weeks. Physical examination revealed systolic murmur on left lower sternal border. Electrocardiogram showed sinus rhythm with T-wave inversion V1-V3. Echocardiogram demonstrated right atrial and ventricular dilatation with suspected mass at RV apex. CMR revealed RV dilatation with excessive, coarse trabeculation at RV apex, with non-compacted end-diastolic thickness of 23.5mm and compacted thickness of 2mm (NC/C ratio 11.7) and RVEF 27%. Extracardiac findings showed pericardial effusion and right pleural effusion.

Discussion: The diagnosis of isolated LVNC is based on the presence of the following CMR and clinical criteria: (1) visual appearance of a compacted epicardial layer and a NC endocardial layer, (2) marked trabeculation and deep intertrabecular recesses within the NC layer, (3) NC/C end-diastolic myocardial ratio >2.3 and (4) the absence of other associated congenital or acquired heart disease. Our patient’s CMR findings met all 4 criteria in her RV.

The clinical presentation of IRVNC include heart failure, ventricular tachycardia, sudden cardiac death, cardio-embolic events and syncope. Our patient presented with right heart failure and syncope. Clinicians should have high suspicion for IRVNC in RHF patients.
Speaker

Nguyen Thanh Van

(VNM) Radiology department, Viet Duc hospital

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Education

Graduated General Practitioner at Hanoi Medical University in 2012.

Post-Graduate Education

Graduated Radiology Resident at Hanoi Medical University in 2015.

Academic Appointments

Study as radiology resident (FFI- faisant fonction d’interne) in France, 2017-2018.

Professional Affiliations and Scientific Publications*


Cardiac cysticercosis on magnetic resonance imaging

Nguyễn Thanh Văn¹, Lê Thanh Dũng¹

¹ Department of Diagnostic Imaging, Viet Duc Friendship Hospital

A 51 year-old female, who presented a pain in epigastric region, had an incidental finding of a intracardiac mass during ultrasound. Ultrasound revealed a heterogeneous hyperechoic mass in right ventricle, attached to the interventricular septum. MRI revealed a 35x23x28mm mass in right ventricle along intraventricular septum, well-demarcated with septal intraventricular muscle. On T1-weighted MR images, the mass was hypointense. On STIR images the mass was hyperintense. After gadolinium administration, no enhancement was present. The patient underwent surgery to remove the tumor. Histologic evaluation showed a necrotic degeneration which exhibited cysticercus. Immunoassay result showed that the patient was positive for cysticercus cellulosae.

Key words: cardiac cysticercosis, cardiac mri.
Speaker

Vu Thu Thuy
(VNM)
108 military central hospital

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Education
Graduated as a general practitioner at the Military Medical Academy in 2008

Post-Graduate Education
Graduated with a master's degree in diagnostic imaging in 2014 at Hanoi Medical University
Currently a PhD student in the Department of Diagnostic Imaging at the 108 Central Military Hospital

Academic Appointments
Malaysia cardiovascular Magnetic Resonance Course (held on 18- 20 September 2017 at INSTITUT JANTUNG NEGARA- Malaysia)
Digital Breast Tomosynthesis Workshop (held on 19 July 2019 at KK Women’s and Children’s Hospital, Singapore.

Professional Affiliations and Scientific Publications

Initial evaluation of lumbar spine magnetic resonance imaging with coaxial compression in degenerative lumbar spinal stenosis, Journal of Clinical Medicine and Pharmacy 108, 2019


Case study reporter at HKCC SCMR Symposium 2021, held at Hong Kong college of Cardiology, June 26, 2021
Asymptomatic right ventricle cavernous hemangioma: A case report

Vu Thu Thuy

108 military central hospital

*Introduction:* Cardiac cavernous hemangioma is a rare primary benign tumour generally diagnosed in young or middle-aged patients. We reported a case of a 71-year-old male patient with a cardiac mass incidentally found on transthoracic echocardiograms. Computed tomography (CT) and magnetic resonance imaging (MRI) showed an oval tumor located at the right ventricle. The tumor was successfully removed and the patient had an uneventful recovery. Histopathological examination confirmed a cardiac cavernous hemangioma.
**Speaker**

Nguyen Thi Huyen  
(VNM)  
Radiology Centre, Bachmai hospital, Hanoi, Vietnam  
Email hoamoclanhmu@gmail.com

**Education**

2013 – 2019: Medical student in Ha Noi Medical University, Ha Noi, Viet Nam;  
Qualification: very good

**Post-Graduate Education**

2019 - now: radiology resident in Ha Noi Medical University and  
Radiology Centre – Bach Mai Hospital, Ha Noi, Viet Nam.

**Academic Appointments**

2019 - now: radiology resident in Ha Noi Medical University and  
Radiology Centre – Bach Mai Hospital, Ha Noi, Viet Nam.

**Professional Affiliations and Scientific Publications**

2021: Servelle-Martorell syndrome in an adult: A case report with findings on CT angiography

**Abstracts**

Acute myocardial infarction in patient with single coronary artery: a case report
Speaker

Tran Huu Nghi

(VNM)
Cardiovascular and thoracic center,
Vietduc university hospital, Hanoi, Vietnam

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Education

2013: Graduated as general practitioner at Hanoi medical university

Post-Graduate Education

2019: Echocardiography training course at Bach Mai Hospital
2020: Vascular sonography training course at National geriatric hospital
Present: Studing internal cardiology master at Hanoi medical university

Academic Appointments


Professional Affiliations and Scientific Publications

Scientific publications:

- An unusual interatrial septum, Echocardiography Wiley, 2020, DOI: 10.1111/echo.14576

Double atrial septum

Tran Huu Nghi
Cardiovascular and thoracic center, Vietduc university hospital, Hanoi, Vietnam

Case report: A 22 – year old man with nonspecific chest pain. On 2D transthoracic echocardiography, his interatrial septum also had a double-membrane anatomy with an interatrial space, there was 12.6*16.6mm sized, crescent shaped, echo-free. On transesophageal echocardiography, slightly cephalad of the interatrial space, a small left-to-right shunt through the patent foramen ovale was noted using color Doppler flow mapping. The multislices computed tomography also indentified double-layered parallel atrial septal structure with persistent interatrial space, there was 8.9*23.1mm sized, crescent shaped, showing contrast enhancement, revealed communicating flow between this space and LA. There is no evidence of thrombus in this space.

Abstract: Double atrial septum is extremely rare atrial septal anomaly forms interatrial space distinguished between two atria by parallel double-layered atrial septal structure, described by Roberson et al in 2006. This interatrial space usually communicates with left atrium via PFO, and with right atrium via accessory atrial septal fenestration (ASF). And these two passages (PFO and ASF) are usually formed in different level, such as superior and inferior. In fetal period, PFO permits right-to-left shunt flow, but double-layered atrial septal structure can disturb this shunt flow therefore, underdevelopment of LV can be frequently combined. It can be also affected with LV, LA, mitral valve and pulmonary venous structures in patients with left heart hypoplasia. Double interatrial septum is increased risk of systemic thromboembolism if communication between the interatrial space and the atria present. It may also represent an obstacle to transseptal puncture during catheter procedures. Due to increasing use of catheterbased interventions requiring a transseptal puncture, the recognition of this anomaly is essential for performing safe and effective procedures.
DAY 3 – AUGUST 21 (SATURDAY) / CHANNEL 3

8:30 - 10:00 (GMT + 7)

Scientific Session 4

Chairperson(s)

Prof. Nguyen Phuoc Bao Quan (VNM)
Prof. Hwan Seok Yong (KOR)

Speaker/Lecturers

Nguyen Thi Diem (VNM)
Nguyen Le Hoang Minh (VNM)
Nguyen Thi Minh Ly (VNM)
Kana Elka (IND)
Pham Thu Thuy (VNM)
Elen (IDN)
Trinh Viet Ha (VNM)

8:30 Subclinical changes in cardiac function detected by speckle tracking echocardiography in the patient with systemic hypertension
Nguyen Thi Diem (VNM)

8:40 Endocardial 2D speckle-tracking echocardiography in patients with ischemic heart disease
Nguyen Le Hoang Minh (VNM)

8:50 Successful device closure of a large rupture of sinus of Valsalva in patient with bicuspid aortic valve
Nguyen Thi Minh Ly (VNM)

9:00 Dilated IVC without cardiac pathology, the first case in Indonesia
Kana Kurniati Elka (IDN)

9:10 Aneurysm of sinus of Valsalva dissecting into interventricular septum: 3D echocardiographic images
Pham Thu Thuy (VNM)

9:20 Formation of mitral-aortic intervalvular fibrosa pseudo-aneurysm (MAIVF-Ps) detected by consecutive echocardiograms - no longer an incidental finding
Pham Thu Thuy (VNM)

9:30 Decreased Global Longitudinal Strain in Rheumatic Mitral Stenosis with Preserved Left Ventricular Ejection Fraction: A Cardiac Magnetic Resonance Feature Tracking Study
Elen (IDN)

9:40 Value of myocardial strain in prognosis of major adverse events in non ST segment elevation acute coronary syndrome after percutaneous coronary intervention
Trinh Viet Ha (VNM)
Speaker

Nguyen Thi Diem
(VNM)
Faculty of Medicine - Can Tho University of Medicine and Pharmacy
Can Tho university hospital
General Hospital of Can Tho City
Email ntdiem@ctump.edu.vn

Education
General practitioner

Post-Graduate Education
2005-2007: Lugansk State Medical university, Ukraine
Master of Cardiology
2011-2018: Hue university, Vietnam
Doctor of noninvasive Cardiology

Academic Appointments
1999: Certificate of active teaching methods- Can Tho university
2000: Certificate of Medical Education – University of Medicine and Pharmacy at Ho Chi Minh.
2012: Certificate of echocardiography- Ha Noi Medical University
2013: Certificate of Holter electrocardiogram-blood pressure- Ha Noi Medical University
2020: Certificate of Fetal echocardiography- Institut Coeur de Hochiminh Ville

Professional Affiliations and Scientific Publications
- Evaluation of left ventricular systolic function in hypertensive patients with heart failure with preserved ejection fraction by speckle tracking echocardiography-Journal of Vietnamese Cardiology, No 72, 2015.
- Survey of arterial age and some complications related to arterial age in hypertensive patients- Can Tho University of Medicine and Pharmacy journal, No 3-4, 2016.
- Assessment of left ventricular diastolic function by speckle tracking echocardiography in patients with hypertension, Internal Medicine, No. 21, 2017.
- Clinical, laboratory, electrocardiographic characteristics and the relationship of QTc with the degree of liver failure according to Child-Pugh in cirrhotic patients, Can Tho University of Medicine and Pharmacy journal, No 19, 2019.
Subclinical changes in cardiac function detected by speckle tracking echocardiography in the patient with systemic hypertension

Nguyen Thi Diem

**Background:** Hypertension is the cause of many cardiovascular events. Recently, 2D speckle tracking echocardiography (STE) technique has helped to assess subclinical changes in cardiac function.

**Objectives:** To evaluate the early change in left ventricular systolic function by 2D speckle tracking echocardiography (STE) in patients with systemic hypertension.

**Method:** A cross-sectional descriptive study, STE technique was used to analyze left ventricular systolic strain in 151 hypertensive patients with normal ejection function and 43 participants without cardiovascular disease as a control group.

**Results:** Global longitudinal strain (GLS), global circumferential strain (GCS), global radial strain (GRS), longitudinal-circumferential and systolic index were markedly decreased in patients with systemic hypertension without left ventricular hypertension compared to control group (-11.84 ± 2.28% vs -16.52 ± 1.19%; -13.0 ± 4.99% vs -17.92 ± 2.39%; 9.82 ± 3.4% vs 12.33 ± 1.94%; -12.42 ± 2.93% vs -17.22 ± 1.44%, 11.58±2.94 vs 15.59±1.46 p <0.001). These indicators also decreased in hypertensive patients without heart failure with preserved ejection fraction. These reductions increased with left ventricular hypertrophy and NYHA levels.

**Conclusion:** STE helps to detect subclinical changes in left ventricular systolic function.

**Key words:** speckle tracking echocardiography, systolic function, strain.
Speaker

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(VNM)
Hue University of Medicine and Pharmacy
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Education
Graduated from Kharkiv National Medical University, Kharkiv, Ukraine

Post-Graduate Education
On-going Master of Medicine education from Hue University of Medicine and Pharmacy
Endocardial 2D speckle-tracking echocardiography in patients with ischemic heart disease

Nguyen Anh Vu¹, Nguyen Le Hoang Minh¹, Nguyen Gia Binh¹, Dang Quoc Y²

¹ Hue University Hospital- Hue university of Medicine and Pharmacy, Hue University
² Minh thien Hospital-Quang nam Province

**Objectives:** study the left ventricular myocardial function with two-dimensional speckle tracking echocardiography and the concordance of endocardial 2DSTE and coronary angiography on the localization of coronary artery stenosis.

**Subjects and methods:** A cross-sectional study was conducted in 60 patient with ischemia heart disease at Hue University Hospital. All of them were examined clinical, 2DSTE (using endocardial layer strain analysis), coronary angiography.

**Results:** 60 patients (34 men, 26 women, 69,08 ± 12,44), Statistically significant 2D-STE reduction of the deformation parameters: global longitudinal strain (GLS) (−8.84% ± 4.74, P <0.05); global circumferential strain (CS) (−12.49% ± 6.02, P < 0.05). The concordance of the GLS segment and coronary artery stenosis by coronary angiography were 0.34 (p<0.05) at anterior wall, 0.53 (p<0.05) at lateral wall, 0.24 (p<0.05) at inferior wall.

**Conclusions:** The study using strain on 2DSTE shows the left ventricular systolic function reduced in patients with CAD. There is a various concordance (not good) about the location of coronary lesions between 2D STE (endocardial strain analysis) and coronary angiography.

**Key words:** Ischemia heart disease, Digital Subtraction Angiography, Two-dimensional speckle tracking echocardiography, coronary disease, coronary angiography.
Speaker

Nguyen Thi Minh Ly
(VNM)
Hanoi Medical University
Heart Center - Hanoi Medical University Hospital

Education
Dr Ly Nguyen has 20 years training in medical field and received her PhD degree in Cardiology at Hanoi Medical University. She has 12 years experience in doing Echocardiography for Intervention. She has attended various courses of Echocardiography Imaging including 3D Echo, Transesophageal echocardiography. Her skills are very much well versed.

Post-Graduate Education
Dr Ly Nguyen spent 3 years studying Resident Doctor of Cardiology from 2008 to 2011.
- She started her PhD in 2015, her dissertation was about pulmonary arterial hypertension (PAH), which she spent a great length of time scanning echo for right heart evaluation for all of her patients. She received her PhD degree in 2020.
- She was granted several scholarships including:
  - 1 month course in Clinical Nutrition, Boston Medical University, USA 2012;
  - 2 months course in leadership and pediatric cardiology at the Royal North Shore Hospital, Westmead Children Hospital, University of Sydney in 2015;
  - 3 weeks course in Fetal Echocardiography at Evelina Children Hospital UK in 2018
- She self paid for several training course including:
  - Clinical Research (ICRT Dubai) at Harvard Medical School (Online), USA for 6 months in 2020.
  - Writing a scientific paper (Cardio WASP) in 2021 at ITHAMS, Italy

Academic Appointments
2009 -now: Lecturer, Cardiology Department, Hanoi Medical University 2016
-now: Vice Director, Heart Center, Hanoi Medical University hospital

Professional Affiliations and Scientific Publications
In English
Successful closure of ostium secundum atrial septal defect percutaneously
in case of congenital complete heart block diagnosed during fetal life and associated with structural heart defect. Journal of Clinical Medicine, Bachmai Hospital

In Vietnamese


Successful device closure of a large rupture of sinus of Valsalva in patient with bicuspid aortic valve

Nguyen Thi Minh Ly

Introduction: Rupture of sinus of Valsalva is a rare entity. It can be a result of an acquired or congenital heart disease. Closure the rupture can be done surgically or transcatheter. Case report: A 61 year-old healthy male, developed dyspnea 2 months ago, was diagnosed of rupture of sinus of Valsalva into right atrium based on transthoracic echocardiography and computed tomography scan of the aorta. At the first hospital, doctors had decided to operate on him. The patient went to our hospital for the second advice. On examination, he had a II/VI systolic murmur at the 2nd right parasternal border, a III/VI diastolic murmur at the 3rd left parasternal border. Transthoracic echocardiogram revealed dilated ascending aorta; bicuspid, mildly stenosed aortic valve; rupture of sinus of Valsalva into right atrium with aortic
end diameter of 12mm, continuous left to right shunt across the defect. We planned to transcathesterly close the rupture. Angiogram revealed a large defect just above the aortic valve, into the right atrium, with shunt diameter of 18mm. A 20/18 Lifetech PDA device was chosen to close the rupture successfully. Angiogram after release the device revealed little residual shunt, no aortic regurgitation. A transthoracic echocardiogram the day after showed complete shunt closure. He was discharged home with 100mg aspirin a day. Discussion: Rupture of sinus of Valsalva can happened in patients with bicuspid aortic valve. Transcathester rupture closure is a less invasive treatment that can utilized successfully in a center specialized in structural heart intervention.
Speaker

Kana Kurniati Elka

(IND)
Semarang Medical Centre, Semarang, Indonesia

Education
Atma Jaya University
Sam Ratulangi University

Post-Graduate Education
ISE echocardiography course

Academic Appointments
2006-2009  Marga Husada Hospital as medical doctor at emergency unit
2009-2012  Telogorejo Hospital as medical doctor
2012-2018  Sam ratulangi General Hospital as cardiologist residency
2018-...  Telogorejo Hospital as cardiologist

Professional Affiliations and Scientific Publications
- The Pulse Wave Velocity is Linearly Correlated with Resting Systolic and Diastolic Blood Pressure in Hypertensive Patients
- Malignant early repolarization syndrome first case series in Indonesia
Dilated IVC without cardiac pathology, the first case in Indonesia
Kana Kurniati Elka
Semarang Medical Centre, Semarang, Indonesia

Introduction

Inferior vena cava (IVC) is a large collapsible vein whose diameter and extent of inspiratory collapse are known to correlate with right atrial (RA) pressures; hence, IVC dilatation represents a cardiac pathology. This case report emphasizes that IVC dilatation may not always have an underlying cardiac pathology.

Clinical report

A 28-year-old female was referred to our cardiology clinic for evaluation of a dilated IVC incidentally noted on abdominal ultrasound. The patient complained of shortness of breath and lower abdominal pain. The patient has a history of curettage 3 times due to miscarriage.

Her laboratory was normal. Echocardiography result normal ejection fraction, slightly dilated RA and RV, mild TR, and dilated IVC without collapse with inspiration. CT coronary artery and CT abdominal result normal coroner, slightly dilated RV and RA, enlargement pulmonary artery, enlargement IVC and AV malformation uterus in right hemipelvis, acting as left to right shunt. We transferred to gynaecology clinic.

Discussion

A dilated IVC without collapse with inspiration is associated with worse survival in patient with history of heart failure. We report young woman with normal ejection fraction, and dilated IVC because of AV malformation uterus. This condition is rare, and to the best our knowledge, this is the first case of isolated dilatation of the IVC reported in our country.
Fig 2. enlargement IVC and AV malformation uterus in right hemipelvis
**Speaker**

**Pham Thu Thuy**

(VNM)

Vietnam National Heart Institute, Bachmai Hospital, Hanoi, Vietnam

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**Education**

2005-2011: Hanoi Medical University, General practitioner. Graduated with the excellent student Award.

2011-2014: Hanoi Medical University, Residency in Cardiology. Graduated with very good degree classification

**Post-Graduate Education**

2014-2015: Paris 6 University, France
Adult congenital heart disease fellowship
2015-2016: Toulouse Paul Sabatier University, La Timone Hospital, Marseille France. Pediatric Cardiology Fellowship

**Professional Affiliations**

From 2016 - present: Q2 Unit, Vietnam National Heart Institute, Bach Mai Hospital, Hanoi, Vietnam.
Cardiologist
Perform from fetus to adult congenital heart disease, idiopathic pulmonary arterial hypertension subspecialty

**Professional Affiliations and Scientific Publications**

Case report: One stage complete repair at an adult patient with PA- VSD, T.Thuy PHAM, T.Huong TRUONG, A.Dung VU. Vietnamese Journal of Cardiology 2014

Aneurysm of sinus of Valsalva dissecting into interventricular septum: 3D echocardiographic images

Aneurysms of sinus of Valsalva (ASV), rare cardiac lesions, are usually diagnosed by typical echocardiographic sign “windsock” when those are unruptured. We report herein an extremely rare type of ASV. A 59-year-old male with unremarkable medical history was hospitalized for progressive dyspnea. Transthoracic echocardiogram showed a significant dilatation of right sinus of Valsalva which connected with a pulsatile aneurysmal structure located on the upper part of interventricular septum (IVS). 3D transesophageal echocardiogram provided excellent images which confirmed the diagnosis of an ASV dissecting into IVS. Antibiotic therapy was applied due to serologically infectious condition then followed by surgical treatment with aortic valve replacement. Our patient fully recovered without any complications including heart block and left ventricular dysfunction.

Key words: Aneurysms of sinus of Valsalva, Dissecting into interventricular septum, Echocardiography.
Abstract

Formation of mitral-aortic intervalvular fibrosa pseudo-aneurysm (MAIVF-Ps) detected by consecutive echocardiograms - no longer an incidental finding

Mitral-aortic intervalvular fibrosa pseudo-aneurysm (MAIVF-Ps) is an uncommon complication of cardiac surgery, heart trauma and especially infective endocarditis. This lesion is usually diagnosed incidentally. Large, symptomatic or complicated MAIVF-Ps requires treatment. A 13-year-old male with a history of radius fracture repair was hospitalized for severe sepsis due to staphylococcus. Initially, echocardiogram only revealed pericardial effusion and thickened MAIVF. However, consecutive evaluations detected the characteristics of the pseudo-aneurysmal cavity, which exhibited systolic expansion and diastolic collapse and communicated with the left ventricular outflow tract. Multi-slice computerized tomography confirmed the presence of a large MAIVF-Ps. The MAIVF was reconstructed surgically. The patient fully recovered without any signs of infection.

Key words: Mitral-aortic intervalvular fibrosa pseudo-aneurysm, Echocardiography, Endocarditis.
Speaker
Elen
(IDN)
Department of Cardiology & Vascular Medicine, Faculty of Medicine Universitas Indonesia, National Cardiovascular Center Harapan Kita – Indonesian Heart Association

Education
- Cardiologist: Department of Cardiology & Vascular Medicine, Faculty of Medicine Universitas Indonesia

Post-Graduate Education
- 11th CT Coronary Angiography Teaching Course, Singapore 2014
- CSI Focus Imaging – CT for LAA closure, Germany, 2017
- CT Imaging for Transcatheter Aortic Valve Implantation Course, Germany, 2017
- SCMR Level III Competence in Cardiovascular Magnetic Resonance, Germany, 2018
- EACVI Level III Competence in Cardiovascular Magnetic Resonance, Germany, 2018
- Nuclear Cardiology & Cardiovascular Imaging (Cardiac Nuclear, CT & MR), National Cardiovascular Center Harapan Kita, Jakarta

Academic Appointments
Clinical Teacher - Department of Cardiology & Vascular Medicine, Faculty of Medicine Universitas Indonesia

Professional Affiliations and Scientific Publications
Professional Affiliation:
- Indonesian Heart Association
- Indonesian Society of Cardiovascular Imaging

Scientific Publication:
- Left ventricular dimension after mitral valve surgery in rheumatic mitral stenosis: The impact of myocardial fibrosis. Journal of Tehran University Heart
- A rare case of superior vena cava lipoma: Its presentation from non-invasive examination. European Heart Journal Cardiovascular Imaging, 2019, 20(10), pp. 1183
- Native T1 and ECV of Noninfarcted Myocardium and Outcome in Patients With Coronary Artery Disease. Journal of the American College of Cardiology, 2018, 71(7), pp. 766–778
Decreased Global Longitudinal Strain in Rheumatic Mitral Stenosis with Preserved Left Ventricular Ejection Fraction: A Cardiac Magnetic Resonance Feature Tracking Study

Elen

Department of Cardiology & Vascular Medicine, Faculty of Medicine Universitas Indonesia, National Cardiovascular Center Harapan Kita – Indonesian Heart Association

**Purpose:** To assess LV myocardial strain by CMR feature-tracking (CMR-FT) in significant rheumatic MS.

**Methods:** We retrospectively analyzed LV feature-tracking in a total 65 subjects who underwent 1.5T-CMR examination: 22 healthy subjects and 43 significant MS patients (with left ventricular ejection fraction (LVEF) ≥55%: n=21, LVEF <55%: n=22). A 2D CMRFT method was used to measure global longitudinal strain (GLS), global radial strain (GRS), and global circumferential strain (GCS). We analyzed these myocardial strain values in those three groups.

**Results:** The subjects enrolled in this study were 42.77 ± 12.10 years old and 64.6% as female. VEF in healthy subjects, MS patients with preserved LVEF (≥55%), MS with reduced LVEF (<55%) were 63.57 ± 4.42%, 61.15 ± 5.83%, 42.62 ± 10.87% (p<0.001). Myocardial strain values for healthy subjects, MS with preserved LVEF, MS with reduced LVEF were GLS -20.90 ± 1.50%, -14.71 ± 3.13%, and -11.48 ± 3.34% (p<0.001); GRS 46.99 ± 7.19%, 45.22 ± 12.79%, and 28.01 ± 9.32% (p<0.001); GCS -21.72 ± 1.64%, -20.61 ± 4.08%, and -15.16 ± 3.27% (p<0.001). Compared with healthy subjects, GLS value in MS with preserved LVEF subjects was significantly decreased (p<0.001). GRS and GCS values were significantly different between healthy subjects and MS with reduced LVEF.

**Conclusion:** GLS was significantly decreased in rheumatic MS with preserved LVEF as assessed by CMR-FT. GRS and GCS were significantly decreased only in rheumatic MS with reduced LVEF, but remains normal in rheumatic MS with preserved LVEF.

Keywords: feature tracking, myocardial strain, rheumatic mitral stenosis
Speaker

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Education

MD
Hanoi Medical University 2005

Resident
Hanoi Medical University 2009
Echocardiography
Vietnam National Heart Institute 2010
St Vincent Hospital, Germany 2018

Post-Graduate Education

MD Hanoi Medical University 2005
Resident at Hanoi Medical University 2009

Value of myocardial strain in prognosis of major adverse events in non ST segment elevation acute coronary syndrome after percutaneous coronary intervention

Purpose: This study sought to assess the value of left ventricular global longitudinal strain (GLS) in prognosis of patients diagnosed non ST segment elevation acute coronary syndrome (NSTE-ACS) after percutaneous coronary intervention.

Retrospective and Prospective study: Prospective study

Results: Average age was 65.5 ± 10.5 (age) and male accounts for 71%. Within 6 months follow up after successful coronary intervention, there were 19 events (accounting for 15.2%). GLS, GCS, GRS and GLSRs in the event group (n=19) were significantly worse than the group without event (n=106) (p <0.001). Post-intervention GLS has the largest area under the curve (AUC 0.945) in predicting major cardiovascular events after percutaneous coronary intervention better than EF (AUC 0.730) and GRACE score (AUC = 0.666) (p <0.05). The cut-off value of GLS = -15.45% has a sensitivity and specificity of 85% and 90%, respectively. The decrease in GLS was related to the occurrence of major cardiovascular events HR = 1.72 [1.12-2.89], p <0.05.
**Conclusion:** Conclusion: Global longitudinal strain (GLS) by 2D speckle tracking echo provides good prognostic information in patients with NSTE-ACS.

**Keywords:** non ST segment elevation ACS, prognosis, global longitudinal strain and strain rate.
Unveiling the Hidden Shunt
The Role of Computed Tomography for Finding and Assessment of Pulmonary Arterio-Venous Malformation

Bayushi Eka Putra\textsuperscript{1,2}, Amiliana Mardiani Soesanto\textsuperscript{1,2}, Oktavia Lilyasari\textsuperscript{1,2}
\textsuperscript{1} Department of Cardiology and Vascular Medicine, Faculty of Medicine Universitas Indonesia/ National Cardiovascular Centre Harapan Kita, Jakarta, Indonesia
\textsuperscript{2} Indonesian Heart Association (IHA)

Introduction

- Central cyanotic which does not respond to oxygen test is usually associated with cardiac or great arteries malformation.
- The differential diagnosis for cyanotic are based on the symptoms and thorax roentgen:
  - Oligemic : Tetralogy of Fallot; Pulmonary Stenosis with Shunt; Pulmonary Atresia; or Ebstein Anomaly
  - Plethora : Common mixing at atrial, atrial-ventricle, or ventricle level; Truncus Arteriosus
- Outside of the differential diagnosis, although very rare, we should consider pulmonary arterio-venous (PAVM) shunt as the etiology
- Pulmonary arterio-venous shunt is considered as a rare entity which is not easily diagnosed. The prevalence is known 1 in every 2600 people. 80% are associated with hereditary haemorrhagic telangiectasia (HHT).

\textbf{Figure 1.} Arteriovenous Malformation Pulmonary (AVM)
\textit{Source: Oliveri F et al. European Journal of Molecular and Clinical Medicine; 5: 46–50. s}
- Complications of PAVM: Paradoxical emboli & Hypoxemia à Severe manifestation if the shunt exceeds 20% of cardiac output

- With a male: female preponderance of 1 : 1.5-1.8, Pregnancy and puberty have been described as potential factors that induce growth.

Case report

23 years old woman
Chief complain: Dyspnea, bluish (central cyanotic)

A 23 years old woman was sent to National Cardiovascular Centre Harapan Kita with cyanotic heart disease. Patient was referred with suspicion of cyanotic congenital heart disease due to the low oxygen saturation (75-76%) and dyspnoea on effort for the last two months. Cyanotic condition had already been noticed since the first decade of life; however, she had no other symptoms at that time. Echo study was done to this patient with normal findings: no shunt, no anomalous pulmonary vein disorder, no cardiac valve abnormalities, and no sign of pulmonary hypertension. Considering the negative oxygen test (no increase of oxygen saturation from non-rebreathing mask 15 l/minute oxygen supplementation), arterio-venous fistula was suspected. Computed tomography was done in this patient and revealed arterio-venous malformation of two fistulas at the right pulmonary artery-vein (Figure 2). Patient was then planned for closure with coiling and device.

Figure 2. Fistula of Right Pulmonary Artery-Vein Proven by Computed Tomography Examination
Discussion

Patients with hidden shunt in the pulmonal area should be suspected in cyanotic patients not responding with oxygen test and normal echocardiography. Computed tomography should be used as the modality of choice in patients suspected with arterial-venous shunt in normal echocardiography findings.

References


Tetralogy of Fallot with Pulmonary Atresia and Major Aortopulmonary Collateral Arteries: Case Report

Phathayphout Phetvilay¹,², MD and Nat Terpenning³, MD

¹ Department of radiology, Mittaphab hospital, University of health sciences Lao P.D.R,
² Department of radiology, Siriraj hospital, Mahidol university, Bangkok, Thailand
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Introduction

Tetralogy of Fallot (TOF), the most common cyanotic congenital heart disease, represents 5% to 7% of all Congenital Heart Disease (CHD). An estimated incidence of 0.5/1000 live births. It is also the most frequent complex CHD in adulthood (1). We are presenting an extreme case of TOF.

Clinical Report

A 42-year-old male presented to Emergency Department (ED) with fatigue, abdominal pain and shortness of breath. His underlying was an uncorrected complex CHD. Two months earlier, he tested positive for Covid-19 and received symptomatic treatment without hospitalization. The initial contrast enhanced CT (CECT) chest, abdomen and pelvis was performed to rule out infection. CECT Chest revealed Multiple Aorto-Pulmonary Collateral Arteries (MAPCAs), absence of main pulmonary artery (Fig 1A-D), overriding aorta, membranous Ventricular Septal Defect (VSD) and Right Ventricular Hypertrophy (RVH) (Figure 2A) suggestive of severe form of TOF. A small right pleural effusion was likely reactive from right-sided subdiaphragmatic abscess (Fig 2B). Echocardiography demonstrated a large membranous VSD and overriding aorta. Please note severe concentric hypertrophy of both ventricles. LVEF was 55-60% (Fig 3).

Figure 1A-D: Figures showed MAPCAs (black arrows) from descending thoracic aorta (black stars). Note right-sided aortic arch, hypertrophic LV and dilated aorta. LV=Left Ventricle, RV=Right Ventricle
**Figure 2A-B:** Figures showed VSD (a black star) and overriding aorta (2A) and right subdiaphragmatic abscess (2B). Note LV hypertrophy and dilated aorta.

**Figure 3:** A figure showed a large membranous VSD and overriding aorta. Note biventricular hypertrophy, the flow across VSD between 2 ventricles and flow from VSD into the overriding aorta (color image).

### Discussion

TOF with pulmonary atresia (PA) is a rare entity of CHD. Classic imaging features include VSD, right ventricular outflow tract obstruction, RVH, overriding aorta, and MAPCAs (2). Due to PA, MAPCAs are present from birth and are alternatives to the systemic pulmonary arterial supply. They usually arise from the descending thoracic aorta but may also take their origins from the subclavian or coronary arteries and the abdominal aorta (1).

Survival rates in unrepaired TOF with pulmonary atresia reported in the literature are as low as 50% at 1 year of age and 8% at 10 years (2). We are reporting an extreme uncorrected TOF with PA who survives till adulthood. Several factor may contribute to increased survival in uncorrected TOF that might be from primarily dependent on the adequacy of pulmonary blood flow derived from MAPCAs (3).

### References


E-Poster

Anomalous Left Coronary Artery from the Pulmonary Artery Syndrome: A case report

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Introduction

Anomalous left coronary artery from the pulmonary artery (ALCAPA) syndrome is a rare congenital abnormality of the coronary system in which left coronary artery (LCA) originates from pulmonary artery (PA) instead of aorta [1]. Prevalence is of 0.25–0.5% [1], mostly isolated, 5% combined with other cardiac anomalies [2].

ALCAPA is classified into infantile and adult types, based on onset. Children are in majority with 90% first year mortality. 10–15% survives to adulthood [3]. Thus, adult patients might be ignored and unreceive treatment.

Case report

A 49-year-old female patient was admitted with current unspecific left chest pain, unremarkable medical report except for three vaginal deliveries. ECG and chest X-ray: no progressive findings. Echocardiography: dilated and tortuous vessel in the cardiac apex and middle interventricular zone, so coronary fistula was suspected (Fig. 1).

Coronary CT angiography: anomalous origin of the LCA from the PA was noted; left main artery (LM), originating from the pulmonary trunk, was sandwiched between aorta and pulmonary trunk; and tortuous dilated left and right coronary arteries (RCA) with multiple collaterals at the anterior cardiac zone were noted (Fig. 2). Though further assessment by digital subtraction angiography (DSA) was advised, she declined the additional work-up due to personal reasons.

Fig 1. Echocardiography of the patient. Two-dimensional ultrasound with a parasternal long-axis view demonstrates a small anterior pericardial effusion and small dilated vessels at the surface of the right ventricular anterior wall (A). Doppler ultrasound shows small and tortuous diastolic flows in the interventricular septum in parasternal long-axis view (B), apical four-chamber view (C) and apical three-chamber view (D).
Discussion

Since pressure in the pulmonary artery (PA) suddenly decreases, retrograde flow from the RCA through collaterals to the LCA reverses to the PA. If retrograde flow to LCA elevates due to multiple collateral circulation from RCA or systemic artery, left ventricular perfusion is enhanced and patients could survive to adulthood [4].

Imaging findings: (1) Echocardiography: dilated origin of the RCA from the aorta, ratio RCA/Aorta > 0.2 and coronary collateral flows in favor of ALCAPA in adults [5]. (2) MSCT: direct visualization of LCA arising from main PA with retrograde flow, dilated and tortuous RCA or intercoronary collateral vessels, left ventricular hypertrophy... (3) DSA, although being the gold standard, is not always appropriate [6].

Differential diagnosis: (1) coronary artery fistula, (2) atherosclerosis (3) Kawasaki’s disease or Takayasu arteritis [6].

Our case, 49-year-old woman, admitted for vague chest pain with particular medical history, ALCAPA was almost unsuspected on echocardiography. We recommend to considerate ALCAPA for cardiac apical collaterals and MSCT should be indicated

References


Sinus of Valsalva Thrombosis Detected on Computed Tomography after Transcatheter Aortic Valve Replacement

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Purposes
Leailet thrombosis after transcatheter aortic valve replacement (TAVR) has been reported recently, whereas thrombus formation in sinus of Valsalva has yet to be fully evaluated. This study describes clinical and cardiac computed tomography (CT) findings of patients with sinus of Valsalva thrombosis.

Methods and Results
Between March 2011 and Aug 2019, 192 patients underwent cardiac CT after TAVR. After a retrospective review of CT images, 9 patients (82 years, male:female=2:7) who had sinus of Valsalva thrombosis identified by cardiac CT. The median interval between TAVR and cardiac CT was 11 days. Sinus of Valsalva thrombosis was frequently detected in the non-coronary sinus (89%, 8/9), and predominantly located in the bottom of the sinus extending upward towards the sinotubular junction (Fig 1). Three patients had concomitant leailet thrombosis (Case 7-9 in Fig 1), and 3 patients had subclinical embolic stroke noted on brain magnetic resonance imaging (Fig 2). All patients had been prescribed aspirin and clopidogrel after TAVRior at least 6 months without anticoagulants.

Fig 1. Multiplanar-reconstructed CT images of sinus of Valsalva thrombosis in the 8 patients.
Conclusions

Cardiac CT after TAVR can detect sinus of Valsalva thrombosis, and attention should be paid to this potential source of subsequent systemic embolization.
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Blood flow dynamics analysis of the main pulmonary artery in repaired tetralogy of Fallot using 4D-flow MRI

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Role of cardiac computed tomography in the detection of left atrial appendage thrombi during routine diagnostic work-up prior to catheter ablation for atrial fibrillation: a single center study

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Detection of anomalous origin of pulmonary arteries in patients with tetralogy of fallot using cardiac CT

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The role of cardiac computed tomography in detecting aberrant subclavian arteries and its compression in patients with tetralogy of fallot

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Pilot Study The Mitral CT Calcium Score Correlating with Wilkins Score in Rheumatic Mitral Stenosis: Added Value of Cardiac CT

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