

Fri. Jul 9, 2021

Track1

Invited Lecture

Invited Lecture01 (I-IL01)

座長:山岸 敬幸 (慶應義塾大学医学部 小児科)

1:30 PM - 2:20 PM Track1 (現地会場)

[I-IL01] Understanding of molecular mechanisms
underlying cardiovascular development

○望月 直樹, 千葉 綾乃, 福井 一, 福本 萌, 中嶋 洋行 (国立
循環器病研究センター 研究所 細胞生物学部)

Invited Lecture

Invited Lecture02 (I-IL02)

Chair: Isao Shiraishi (National Cerebral and Cardiovascular
Center, Japan)

2:25 PM - 3:15 PM Track1 (現地会場)

[I-IL02] Vaping away the pulmonary circuit : acute
respiratory distress syndrome and right Side
heart failure

○Mark A. Sussman (San Diego State University,
USA)

Invited Lecture

Invited Lecture03 (I-IL03)

座長:住友 直方 (埼玉医科大学国際医療センター 小児心臓科)

3:20 PM - 4:10 PM Track1 (現地会場)

[I-IL03] Recent advances of comprehensive genetic
analysis in arrhythmia research

○蒔田 直昌 (国立循環器病研究センター 研究所副所
長・創薬オミックス解析センター)

Track2

Invited Lecture

Invited Lecture04 (I-IL04)

Chair: Hikoro Matsui (Pediatrics, University of Tokyo, School
of Medicine, Japan)

9:00 AM - 9:30 AM Track2 (Web開催会場)

[I-IL04] Fetal intervention

○Rajiv Chaturvedi (The Hospital for Sick Children,
Canada)

Track3

Invited Lecture

Invited Lecture05 (I-IL05)

Chair: Atsuko Kato (National Cerebral and Cardiovascular
Center, Japan)

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1:30 PM - 2:10 PM Track3 (Web開催会場)

[I-IL05] Infants with borderline left heart hypoplasia

with successful biventricular outcomes :
insights from cardiac magnetic resonance
imaging

○Kyong-Jin Lee (Division of Pediatric Cardiology,
Department of Pediatrics, Stanford University School
of Medicine, USA)

Invited Lecture

Invited Lecture06 (I-IL06)

Chair: Sung-Hae Kim (Shizuoka Children's Hospital, Japan)

2:20 PM - 3:00 PM Track3 (Web開催会場)

[I-IL06] The role of the right ventricle in tricuspid
valve function

○Kandice Mah (British Columbia Children's Hospital,
Canada)

Sat. Jul 10, 2021

Track1

Invited Lecture

Invited Lecture07 (II-IL07)

Chair: Isao Shiraishi (National Cerebral and Cardiovascular
Center, Japan)

9:00 AM - 9:50 AM Track1 (現地会場)

[II-IL07] The future of diagnostic imaging in congenital
heart disease

○Tal Geva (Department of Cardiology, Boston
Children's Hospital, USA)

Invited Lecture

Invited Lecture08 Sponsored (II-IL08)

Chair: Hajime Ichikawa (National Cerebral and Cardiovascular
Center, Japan)

Sponsored by Johnson & Johnson K.K.

9:55 AM - 10:45 AM Track1 (現地会場)

[II-IL08] The " Super-Glenn" : towards a Fontan or bi-
ventricular circulation

○Pedro J. del Nido (Boston Children's Hospital,
Harvard Medical School, USA)

Invited Lecture

Invited Lecture09 (II-IL09)

Chair: Takaaki Suzuki (Saitama Medical University
International Medical Center, Japan)

10:50 AM - 11:40 AM Track1 (現地会場)

[II-IL09] Building teams for the growing population of

adults with congenital heart disease

○ Joseph A. Dearani (Department of Cardiovascular Surgery Mayo Clinic, USA)

Invited Lecture

Invited Lecture10 (II-IL10)

座長:安河内 聡 (慈泉会相澤病院)

11:45 AM - 12:20 PM Track1 (現地会場)

[II-IL10] Evolution of Pediatric Cardiology in the Era of Changes and Diversity

○ 津田 武 (Nemours Cardiac Center, Alfred I. duPont Hospital for Children, Sidney Kimmel Medical College at Thomas Jefferson University, USA)

Invited Lecture

Invited Lecture11 (II-IL11)

座長:黒崎 健一 (国立循環器病研究センター 小児循環内科)

2:50 PM - 3:40 PM Track1 (現地会場)

[II-IL11] Journey as a Cardiologist

○ 大津 欣也 (国立循環器病研究センター 理事長)

Track2

Invited Lecture

Invited Lecture12 (II-IL12)

Chair: Hitoshi Kato (National Center for Child Health and Development, Japan)

9:00 AM - 9:40 AM Track2 (Web開催会場)

[II-IL12] Exploring the promise of cardiac rehabilitation in youth with congenital heart disease

○ Michael Khoury (Division of Pediatric Cardiology, Department of Pediatrics, Stollery Children's Hospital / University of Alberta, Canada)

Invited Lecture

Invited Lecture13 (II-IL13)

Chair: Kiyohiro Takigiku (Nagano Children's Hospital, Japan)

9:50 AM - 10:30 AM Track2 (Web開催会場)

[II-IL13] Predictors of outcome in fetuses with congenital heart disease

○ Lynne Nield (Sunnybrook Health Sciences Center, Michael Garron Hospital, The Hospital for Sick Children, Canada)

Track3

Invited Lecture

Invited Lecture14 Sponsored (II-IL14)

Chair: Takashi Sasaki (Nippon Medical School Hospital, Japan)
Sponsored by Baxter Limited
4:30 PM - 5:20 PM Track3 (Web開催会場)

[II-IL14] Surgical management of complex transposition of great arteries: what we have learned in 4 decades

○ Emre Belli (Institut Jacques Cartier, France)

Invited Lecture

Invited Lecture15 (II-IL15)

座長:笠原 真悟 (岡山大学医歯薬学総合研究科 心臓血管外科)

5:30 PM - 6:30 PM Track3 (Web開催会場)

[II-IL15] Designing tailor-made surgical plan for congenital heart diseases by fusion approach between 3D heart model and computer simulation

○ 久田 俊明, 杉浦 清了, 岡田 純一, 鷲尾 巧 (株式会社U T-Heart研究所)

Sun. Jul 11, 2021

Track6

Invited Lecture

Invited Lecture16 (III-IL16)

Chair: Hideo Ohuchi (National Cerebral and Cardiovascular Center, Japan)

9:00 AM - 9:50 AM Track6 (現地会場)

[III-IL16] The Fontan in 2021 : new understandings and new challenges

○ David J. Goldberg (Perelman School of Medicine at the University of Pennsylvania / Children's Hospital of Philadelphia, USA)

Invited Lecture

Invited Lecture01 (I-IL01)

座長:山岸 敬幸 (慶應義塾大学医学部 小児科)

Fri. Jul 9, 2021 1:30 PM - 2:20 PM Track1 (現地会場)

[I-IL01] Understanding of molecular mechanisms underlying cardiovascular development

○望月 直樹, 千葉 綾乃, 福井 一, 福本 萌, 中嶋 洋行 (国立循環器病研究センター 研究所 細胞生物学部)

(Fri. Jul 9, 2021 1:30 PM - 2:20 PM Track1)

[I-IL01] Understanding of molecular mechanisms underlying cardiovascular development

○望月 直樹, 千葉 綾乃, 福井 一, 福本 萌, 中嶋 洋行 (国立循環器病研究センター 研究所 細胞生物学部)

Keywords: 生体イメージング, ゼブラフィッシュ, 発生

個体発生の際の諸臓器形成には、酸素化が老廃物のクリアランスが不可欠となるために循環臓器(心臓・脈管系)の発生が先行する。心臓・脈管形成時には頭尾軸、背腹軸、左右軸に従った臓器組織の前駆細胞の配置と同細胞の増殖・分化・遊走による臓器形成が必要である。これらの過程を調節する情報伝達の経時的な変化による繊細な制御により臓器形成が完了する。哺乳類では、両側の中胚葉由来の心筋細胞前駆細胞が一次心臓領域、二次心臓領域細胞に分化しさらに心室筋・心房筋・刺激伝導系心筋細胞に成熟することで心筋が成熟する。この初期の配置には、左右軸決定が先行する。また、特に房室間の心筋細胞は弁形成や刺激伝導系形成にも関わることから、特殊な情報伝達を制御する心筋細胞と考えられる。心臓内の内皮細胞は新内膜内皮細胞として血流にさらされており、またこの心内膜内皮細胞と流入路(大静脈)と流出路(大動脈)が接着することで全身循環が成立する。心内膜内皮細胞は、心筋層を貫通して冠血管形成にも関わるということが明らかにされている。本講演では、左右軸決定機構、心房形成における Hippoシグナルの重要性、心内膜内皮細胞の心臓形成における役割を生体蛍光イメージングで明らかにしてきたことを紹介する。本研究では、ゼブラフィッシュ胚をイメージングの対象として、如何にして循環臓器が形成されるかを形態(心筋細胞・内皮細胞)と情報伝達(転写制御)を同時に可視化することで検討してきた結果を発表する。

Invited Lecture

Invited Lecture02 (I-IL02)

Chair: Isao Shiraishi (National Cerebral and Cardiovascular Center, Japan)

Fri. Jul 9, 2021 2:25 PM - 3:15 PM Track1 (現地会場)

[I-IL02] Vaping away the pulmonary circuit : acute respiratory distress
syndrome and right Side heart failure

○Mark A. Sussman (San Diego State University, USA)

(Fri. Jul 9, 2021 2:25 PM - 3:15 PM Track1)

[I-IL02] Vaping away the pulmonary circuit : acute respiratory distress syndrome and right Side heart failure

○Mark A. Sussman (San Diego State University, USA)

Invited Lecture

Invited Lecture03 (I-IL03)

座長:住友 直方 (埼玉医科大学国際医療センター 小児心臓科)

Fri. Jul 9, 2021 3:20 PM - 4:10 PM Track1 (現地会場)

[I-IL03] Recent advances of comprehensive genetic analysis in arrhythmia research

○ 蒔田 直昌 (国立循環器病研究センター 研究所副所長・創薬オミックス解析センター)

(Fri. Jul 9, 2021 3:20 PM - 4:10 PM Track1)

[I-IL03] Recent advances of comprehensive genetic analysis in arrhythmia research

○ 蒔田 直昌 (国立循環器病研究センター 研究所副所長・創薬オミックス解析センター)

Invited Lecture

Invited Lecture04 (I-IL04)

Chair: Hikoro Matsui (Pediatrics, University of Tokyo, School of Medicine, Japan)

Fri. Jul 9, 2021 9:00 AM - 9:30 AM Track2 (Web開催会場)

[I-IL04] Fetal intervention

○Rajiv Chaturvedi (The Hospital for Sick Children, Canada)

(Fri. Jul 9, 2021 9:00 AM - 9:30 AM Track2)

[I-IL04] Fetal intervention

○Rajiv Chaturvedi (The Hospital for Sick Children, Canada)

Invited Lecture

Invited Lecture05 (I-IL05)

Chair: Atsuko Kato (National Cerebral and Cardiovascular Center, Japan)

Fri. Jul 9, 2021 1:30 PM - 2:10 PM Track3 (Web開催会場)

[I-IL05] Infants with borderline left heart hypoplasia with successful
biventricular outcomes : insights from cardiac magnetic resonance
imaging

○Kyong-Jin Lee (Division of Pediatric Cardiology, Department of Pediatrics, Stanford
University School of Medicine, USA)

(Fri. Jul 9, 2021 1:30 PM - 2:10 PM Track3)

[I-IL05] Infants with borderline left heart hypoplasia with successful biventricular outcomes : insights from cardiac magnetic resonance imaging

○Kyong-Jin Lee (Division of Pediatric Cardiology, Department of Pediatrics, Stanford University School of Medicine, USA)

The management pathway at the extremes of the hypoplastic left heart spectrum is clear; however, in those with patent mitral and aortic valves and “borderline” hypoplasia of the left ventricle, the initial decision-making process with regards to single versus biventricular pathway is complex and challenging. Infants who achieve biventricular physiology may suffer with residual left-heart pathology causing pulmonary hypertension.

Cardiovascular imaging during this critical assessment stage seeks to quantify functionality of hypoplastic ± stenotic left heart structures, often occurring at multiple levels. Contemporary decision-making recognizes the “growth” potential of these structures and incorporates an expanded armamentarium of cardiac procedural options, including fetal interventions, staging procedures such as the hybrid stage one (arterial duct stenting and bilateral pulmonary artery banding), endocardial fibroelastosis resection and novel mitral valve replacement surgery.

2D-echocardiography has historically been the main determinant in decision-making. Cardiovascular magnetic resonance imaging (CMR) is increasingly being utilized as it provides additional parameters such as ascending aortic flow as well as superior three-dimensional quantification of ventricular volume.

This presentation will focus on the utilization of CMR in the assignment to single and biventricular strategies. As well, the characteristics of successful biventricular hearts i.e. without residual pulmonary hypertension, will be discussed.

Invited Lecture

Invited Lecture06 (I-IL06)

Chair: Sung-Hae Kim (Shizuoka Children's Hospital, Japan)

Fri. Jul 9, 2021 2:20 PM - 3:00 PM Track3 (Web開催会場)

[I-IL06] The role of the right ventricle in tricuspid valve function

○Kandice Mah (British Columbia Children's Hospital, Canada)

(Fri. Jul 9, 2021 2:20 PM - 3:00 PM Track3)

[I-IL06] The role of the right ventricle in tricuspid valve function

○Kandice Mah (British Columbia Children's Hospital, Canada)

Tricuspid valve anatomy varies amongst individuals. This variability increases in congenital heart disease. Maintaining normal tricuspid valve function requires precise orientation of the valvar apparatus within the right ventricle which can be affected by the right ventricular function and size. In congenital heart disease, especially in the context of hypoplastic left heart syndrome, the ability for a tricuspid valve to maintain competency is dependent on its ability to adapt to the changes in hemodynamics. In today's discussion we will discuss the role the right ventricle plays in influencing tricuspid valve function.

Invited Lecture

Invited Lecture07 (II-IL07)

Chair: Isao Shiraishi (National Cerebral and Cardiovascular Center, Japan)

Sat. Jul 10, 2021 9:00 AM - 9:50 AM Track1 (現地会場)

[II-IL07] The future of diagnostic imaging in congenital heart disease

○Tal Geva (Department of Cardiology, Boston Children's Hospital, USA)

(Sat. Jul 10, 2021 9:00 AM - 9:50 AM Track1)

[II-IL07] The future of diagnostic imaging in congenital heart disease

○Tal Geva (Department of Cardiology, Boston Children's Hospital, USA)

Invited Lecture

Invited Lecture08 Sponsored (II-IL08)

Chair: Hajime Ichikawa (National Cerebral and Cardiovascular Center, Japan)

Sponsored by Johnson & Johnson K.K.

Sat. Jul 10, 2021 9:55 AM - 10:45 AM Track1 (現地会場)

[II-IL08] The “ Super-Glenn” : towards a Fontan or bi-ventricular circulation

○Pedro J. del Nido (Boston Children’s Hospital, Harvard Medical School, USA)

(Sat. Jul 10, 2021 9:55 AM - 10:45 AM Track1)

[II-IL08] The “ Super-Glenn” : towards a Fontan or bi-ventricular circulation

○Pedro J. del Nido (Boston Children’s Hospital, Harvard Medical School, USA)

The superior vena cava to right pulmonary artery shunt was first described by William Glenn as a more stable source of pulmonary blood flow in patients with cyanotic heart disease compared to a Blalock shunt. At present, the Glenn shunt is the most commonly used inter-stage procedure for single ventricle physiology. However, the Glenn shunt provides only a limited amount of pulmonary blood flow, which decreases with age. Flow distribution in the pulmonary arteries has been shown to favor the side of the Glenn connection, and contra-lateral pulmonary artery flow is usually less than 30% of total lung flow when pulmonary resistance in each lung is similar.

The concept of augmenting pulmonary blood flow to a Glenn shunt has been considered for over two decades. However, in most cases this was done by leaving antegrade flow at the time of Glenn creation, usually in young infants with still elevated pulmonary resistance.

Our center has explored the use of supplementary blood flow to the Glenn for the purpose of either increasing flow to the contralateral pulmonary artery and improve systemic oxygenation, or as a way to increase total pulmonary flow and blood return to the left heart to induce left ventricular growth with a plan to achieve a bi-ventricular circulation (BiV). We have termed this approach the “ super Glenn”. We have found that in both instances the additional pulmonary flow, usually with a Blalock shunt, is well tolerated and can result in improved systemic oxygenation and total pulmonary blood flow without significant rise in Glenn pressure. The addition of a restriction between the Glenn connection and the shunt insertion to the contralateral pulmonary artery is often needed to ensure that most of the additional pulmonary flow from the shunt does not compete with Glenn flow.

In a recent report we described our results with 37 patients where a Super Glenn was used as part of a BiV staging procedure. Most children had hypoplastic left heart syndrome as the primary diagnosis. There were no early or hospital deaths and 62% achieved a BiV circulation at a median of 11.3 months after Super Glenn. We conclude that for the Super Glenn that is done for left ventricular recruitment, this procedure achieves consistent growth of the left ventricle. This may be a useful strategy to help achieve a successful BiV circulation in patients with borderline left ventricle. Optimization of pulmonary blood flow is critical and pulmonary over circulation should be avoided. More studies are needed to evaluate the utility of this technique and to further define adequacy and definitions of LV growth as a means to achieving BiV circulation.

Invited Lecture

Invited Lecture09 (II-IL09)

Chair: Takaaki Suzuki (Saitama Medical University International Medical Center, Japan)

Sat. Jul 10, 2021 10:50 AM - 11:40 AM Track1 (現地会場)

[II-IL09] Building teams for the growing population of adults with congenital heart disease

○Joseph A. Dearani (Department of Cardiovascular Surgery Mayo Clinic, USA)

(Sat. Jul 10, 2021 10:50 AM - 11:40 AM Track1)

[II-IL09] Building teams for the growing population of adults with congenital heart disease

○Joseph A. Dearani (Department of Cardiovascular Surgery Mayo Clinic, USA)

Improvement in surgical techniques, anesthesia, and perioperative care has resulted in most children born with congenital heart disease to survive into the adult years with a normal or near normal quality of life. A careful transition from pediatric to adult care providers is important to avoid issues related to the loss of continuity of care an undue financial or psychological burden to the patients and their families. The patient's, their families, and the healthcare providers are faced with many challenges during this transition process that can be optimized an overcome by Education about the heart defects and a team approach with clear lines of communication. This presentation will address several challenges related to a transition of care from pediatrics to adults, and some of the specific medical and surgical challenges that face all the adult Congenital healthcare providers.

At the present time there are more adults with congenital heart disease then there are children and part of this is due to improvement in survival for the vast majority of infants with congenital heart disease who have undergone successful surgery during infancy and childhood with most living well into the adult years. Residual or recurrent lesions may precipitate the need for reoperation and some patients require multiple surgical procedures or interventions over the course of a lifetime. Arrhythmias are also a common problem to most all congenital defects and require medical therapy or percutaneous/surgical treatment.

The most common problems encountered in the adult congenital population are valve related; most result in the need for numerous reoperations and many of these valve interventions involve more than one valve abnormality. Approaches to patient selection and strategies and risks related to surgery in the ACHD population will be reviewed.

Invited Lecture

Invited Lecture10 (II-IL10)

座長:安河内 聡 (慈泉会相澤病院)

Sat. Jul 10, 2021 11:45 AM - 12:20 PM Track1 (現地会場)

[II-IL10] Evolution of Pediatric Cardiology in the Era of Changes and Diversity

○津田 武 (Nemours Cardiac Center, Alfred I. duPont Hospital for Children, Sidney Kimmel
Medical College at Thomas Jefferson University, USA)

(Sat. Jul 10, 2021 11:45 AM - 12:20 PM Track1)

[II-IL10] Evolution of Pediatric Cardiology in the Era of Changes and Diversity

○津田 武 (Nemours Cardiac Center, Alfred I. duPont Hospital for Children, Sidney Kimmel Medical College at Thomas Jefferson University, USA)

医学・医療を取り囲む昨今の「時代」の変化の本質は、(1)生命科学とテクノロジーの発達、(2)情報革命とそれに伴う情報公開、そして(3)多様な価値観の出現から生まれたものとも言えよう。小児循環器の分野でも変わりゆく時代の要請に即した「進化」が求められているが、それらは以下の三点に要約される。第一は、「小児科学」自体の概念の進化であろう。小児循環器学における主要対象疾患である先天性や後天性心疾患は、従来は難治性疾患の範疇に属するものであった。近年のより深い病態の理解と診断や治療法の進歩により、小児心疾患の予後や生存率は著しく向上し、多くの患者たちが無事成人を迎えるに至った。その結果、従来経験しなかった新しい病態が出現し、これらがしばしば医療現場での試練と葛藤になっている。「成人先天性心疾患 Adult Congenital Heart Disease」という新しい臨床領域は、こういった背景から生まれた必然の産物だとも言えよう。一方、成人性の心疾患やその危険因子は、小児期の目に見えない前臨床的 Preclinicalな異常から始まっていることも判明してきた。これらは、小児癌の長期生存者にみられる成人期の重篤な心疾患の罹患率の高さからも覗える。「小児科学」の一部は、「生涯医学」として進化発展していくことが望まれる。第二は、基礎医学 Basic Scienceの重要さの認識であろう。高度最新医療、特に遺伝子治療、幹細胞医療、再生医療、Precision Medicineなどは、分子・細胞レベルの生物学 Biologyの理解なしでは成立しない領域である。実験的医療も、その有効性と安全性と採算性が証明されれば、やがて実用化に至る。医師の究極の責務は、患者の健康や Quality of Lifeのための最良の選択肢を提供することにある。そのためには病態の科学的な理解は必須であるが、多くの若い医師達にとって基礎医学に専心できる期間は限られている。臨床医学と基礎医学の乖離への懸念が指摘されて久しいが、どのように有効に基礎医学の大切さを後進の臨床医に伝えていくかは、今後の大きな課題である。そのためには、複雑な生命や病態のメカニズムを明解に指導できる魅力ある臨床教育者の養成が急務であろう。最後に、多様性の問題は、現代社会が抱える問題そのものでもある。多様な価値観、生命観、倫理観の存在を我々は寛容に受け入れ、ひとつひとつの例に対して柔軟に対応していくことが肝要である。また医師は、どの社会にも存在する「貧困」や「差別」から目を背けてはならない。大切なことは、先入観や固定観念に囚われず目の前の患者から常に学ぶ姿勢を続けることである。その努力の累積こそが「進化」そのものであり、若い人達は、この主要な担い手として勇気を持って小児循環器学の進化に参加して欲しい。

Invited Lecture

Invited Lecture11 (II-IL11)

座長:黒寄 健一 (国立循環器病研究センター 小児循環内科)

Sat. Jul 10, 2021 2:50 PM - 3:40 PM Track1 (現地会場)

[II-IL11] Journey as a Cardiologist

○大津 欣也 (国立循環器病研究センター 理事長)

(Sat. Jul 10, 2021 2:50 PM - 3:40 PM Track1)

[II-IL11] Journey as a Cardiologist

○大津 欣也（国立循環器病研究センター 理事長）

Keywords: 心不全, 細胞死, オートファジー

私は1983年に大阪大学を卒業して以来、循環器学臨床、医学教育、医学研究に携わってきました。その間約16年間海外で仕事する機会を得て様々な視点から医学を見てきました。以前は若手医師にとって海外留学を経験することはキャリア形成上、有用なものだと考えられ、大多数の医師は学位を取得した後、海外に渡り数年間研究に従事しました。しかし、最近では、グローバル化が進んで地球人として生きていく必要があるのにも関わらず若手医師の留学数が減っています。本発表ではわたくしが歩んだ医学研究の道を辿りながらグローバルな視点を持つ医学研究者になるにはどうしたらいいか、みなさんと共に考えたいと思います

Invited Lecture

Invited Lecture12 (II-IL12)

Chair: Hitoshi Kato (National Center for Child Health and Development, Japan)

Sat. Jul 10, 2021 9:00 AM - 9:40 AM Track2 (Web開催会場)

[II-IL12] Exploring the promise of cardiac rehabilitation in youth with congenital heart disease

○Michael Khoury (Division of Pediatric Cardiology, Department of Pediatrics, Stollery
Children's Hospital / University of Alberta, Canada)

(Sat. Jul 10, 2021 9:00 AM - 9:40 AM Track2)

[II-IL12] Exploring the promise of cardiac rehabilitation in youth with congenital heart disease

○Michael Khoury (Division of Pediatric Cardiology, Department of Pediatrics, Stollery Children's
Hospital / University of Alberta, Canada)

Invited Lecture

Invited Lecture13 (II-IL13)

Chair: Kiyohiro Takigiku (Nagano Children's Hospital, Japan)

Sat. Jul 10, 2021 9:50 AM - 10:30 AM Track2 (Web開催会場)

[II-IL13] Predictors of outcome in fetuses with congenital heart disease

○Lynne Nield (Sunnybrook Health Sciences Center, Michael Garron Hospital, The Hospital
for Sick Children, Canada)

(Sat. Jul 10, 2021 9:50 AM - 10:30 AM Track2)

[II-IL13] Predictors of outcome in fetuses with congenital heart disease

○Lynne Nield (Sunnybrook Health Sciences Center, Michael Garron Hospital, The Hospital for Sick Children, Canada)

The presentation will outline the challenges and pitfalls of predicting postnatal outcomes in fetuses diagnosed with congenital heart disease. I will review current predictors of outcomes, including fetal echocardiographic and clinical measurements. The presentation will focus on a particularly challenging cohort of fetuses, those with borderline left ventricles, and those with possible coarctation of the aorta, with a series of case vignettes.

Invited Lecture

Invited Lecture14 Sponsored (II-IL14)

Chair: Takashi Sasaki (Nippon Medical School Hospital, Japan)

Sponsored by Baxter Limited

Sat. Jul 10, 2021 4:30 PM - 5:20 PM Track3 (Web開催会場)

[II-IL14] Surgical management of complex transposition of great arteries: what we have learned in 4 decades

○Emre Belli (Institut Jacques Cartier, France)

(Sat. Jul 10, 2021 4:30 PM - 5:20 PM Track3)

[II-IL14] Surgical management of complex transposition of great arteries: what we have learned in 4 decades

○Emre Belli (Institut Jacques Cartier, France)

The term Transposition of Great Arteries (TGA) defines a large spectrum of anomalies associated with discordant ventriculo-arterial connection, both anatomically and hemodynamically. It can be qualified as “simple”, essentially defining the presence of intact interventricular septum or “complex”, defining the presence of associated lesions: VSD, left and right ventricular outflow tract obstruction, Aortic arch obstruction and also some complex forms of coronary anatomy.

Nowadays, in absence of significant left ventricular outflow stenosis or atresia, the anatomical repair of all forms of TGA requires the Arterial Switch Procedure. In this setting, congenitally corrected Transposition of Great Arteries and Double Outlet Right Ventricle with sub-pulmonary VSD (Taussig-Bing anomaly) can also be defined as “complex” forms TGA.

The clinical and surgical strategy, and surgical techniques for each specific forms of TGA have improved in time reaching excellent outcomes. In my lecture all these specific strategical and technical aspects will be approached.

Invited Lecture

Invited Lecture15 (II-IL15)

座長:笠原 真悟 (岡山大学医歯薬学総合研究科 心臓血管外科)

Sat. Jul 10, 2021 5:30 PM - 6:30 PM Track3 (Web開催会場)

[II-IL15] Designing tailor-made surgical plan for congenital heart diseases by
fusion approach between 3D heart model and computer simulation

○久田 俊明, 杉浦 清了, 岡田 純一, 鷺尾 巧 (株式会社UT-Heart研究所)

(Sat. Jul 10, 2021 5:30 PM - 6:30 PM Track3)

[II-IL15] Designing tailor-made surgical plan for congenital heart diseases by fusion approach between 3D heart model and computer simulation

○久田 俊明, 杉浦 清了, 岡田 純一, 鷲尾 巧 (株式会社UT-Heart研究所)

Keywords: 先天性心疾患, 心臓シミュレーション, レプリカ

先天性心疾患の手術が行われる小児の心臓は極めて小さい上に病変のバリエーションが大きく、立体構造が極めて複雑なことから、現在も外科治療は困難を極めている。こうした問題を解決するために国立循環器病センターとクロスエフェクト社では特殊な画像処理技術と3Dプリンティング-真空注型技術を駆使した、実物大の「超軟質精密心臓レプリカ」を開発し、術前に心臓の内部構造を隈なく観察し手術リハーサルまでを可能することで、術式決定と安全性の向上に貢献してきた。一方 UT-Heart研究所は細胞内の分子機構に基づいて心臓の興奮・収縮弛緩から血液の流れ,さらには弁の動きまでをコンピュータ内の精密3Dモデルとして再現するマルチスケール・マルチフィジックス心臓シミュレータ(UT-Heart)を開発している。今回、両者の技術を融合することで立体構造把握と手術リハーサルに加え、手術による血行動態や電気生理などの機能変化までを総合的に検討し予測することが可能となるとの考えから共同研究(ped UT-Heartプロジェクト)を開始した。すなわちリアル(心臓レプリカ/形)とバーチャル(心臓シミュレーション/機能)の融合によって患者の長期予後までも見据えた手術計画支援の実現を目指す試みである。今回の発表では UT-Heart開発の経緯とその原理を解説した後、 ped UT-Heartプロジェクトの開発状況について実際の症例に基づいて紹介する。

Invited Lecture

Invited Lecture16 (III-IL16)

Chair: Hideo Ohuchi (National Cerebral and Cardiovascular Center, Japan)

Sun. Jul 11, 2021 9:00 AM - 9:50 AM Track6 (現地会場)

[III-IL16] The Fontan in 2021 : new understandings and new challenges

○David J. Goldberg (Perelman School of Medicine at the University of Pennsylvania /
Children's Hospital of Philadelphia, USA)

(Sun. Jul 11, 2021 9:00 AM - 9:50 AM Track6)

[III-IL16] The Fontan in 2021 : new understandings and new challenges

○David J. Goldberg (Perelman School of Medicine at the University of Pennsylvania / Children's Hospital of Philadelphia, USA)

The Fontan operation, originally described for the surgical management of tricuspid atresia, is now the final surgery in the strategy of staged palliation for several different forms of single ventricle congenital heart disease. Despite the improved technical outcomes of the Fontan operation, staged palliation does not recreate a normal physiology. Without a pumping chamber delivering blood to the lungs, the cardiovascular system is less efficient; cardiac output is generally diminished, and the systemic venous pressure is increased. As a result, patients with "Fontan physiology" may face a number of life-altering or life-threatening complications including decreased exercise capacity, sarcopenia and osteopenia, hepatic dysfunction, thromboses, and various forms of lymphatic insufficiency.

While staged palliation has resulted in remarkable survival, the possible complications for this group of patients are complex, involve multiple organ systems, and can be life threatening. Identifying the mechanisms associated with each of the rare complications and developing strategies to treat them requires the work of many people at many institutions. There are opportunities to develop registries to allow for a more comprehensive understanding these patients, to develop medical strategies to optimally support the circulation, and to develop new applications of mechanical circulatory support to aid those who physiology has failed. Continued and expanded collaboration between sub-specialists and between institutions will be required to optimize the care for those born with single ventricle congenital heart disease.