台灣心臟超音波學會

2025Comprehensive Review and Advance Course in Echocardiography

Time (時間)：2025.08.10(日) 08:00 – 17:00

Venue (地點)：台北市北投區振興醫院第二醫療大樓 6 樓國際會議廳

Time	Topic	Speaker	Moderator
08:00 – 08:45	***Registration***		
08:45 – 08:50	***Welcome Address***		殷偉賢理事長
08:50 – 09:10	Quantifications of AS , AR and TAVR	李慶威醫師	
09:10 – 09:30	Quantifications of MR and MS	李廣祚醫師	
09:30 – 09:50	Left Ventricular Systolic Function	洪明銳醫師	
09:50 – 10:10	Assessment of Diastolic Function	廖若男醫師	
10:10 – 10:30	Right Ventricular Function and Speckle Tracking Imaging	蔡蕙如醫師	
10:30 – 10:50	Endocarditis: Diagnosis,Evaluation and Management by Echocardiography	楊甯貽醫師	
	中場休息 10 分鐘		
11:00 – 11:20	Why do we need Strain Echocardiography	梁馨月醫師	
11:20 - 11:40	Stress Echocardiography：An overview	梁馨月醫師	
11:40 – 12:00	Diagnosis of Aortic Dissection, Atheroma and Intramural Hematoma: Role of Transthoracic and Transesophageal Echocardiography	秦志輝醫師	
12:00 - 12::20	主動脈瓣膜疾病	秦志輝醫師	
12:20 – 13:20	Lunch break		
13:20 – 13:40	Cardiac Tumors and Thrombus:Differential Diagnosis and Evaluation	洪國竣醫師	
13:40 – 14:00	Prosthetic Valves: 2-D and Doppler Approach for Evaluating of Normal Prosthetic Valve and Valve Dysfunction (TTE and TEE)	李道輿醫師	
14:00 – 14:20	Ischemic Mitral Regurgitation	洪崇烈醫師	
14:20 - 14:40	Hypertrophy Cardiomyopathy	林隆君醫師	
	中場休息 10 分鐘		
14:50 – 15:10	Constrast Echocardiography	王子林醫師	
15:10 – 15:30	Common Congenital Heart Defects in the Adult: Diagnosis, Evaluation by 2-D and Doppler Echo	張嘉侃醫師	
15:30 – 15:50	3D Echo: An overview	林煥淋醫師	
15:50 – 16:10	Constrictive pericarditis vs Restrictive Cardiomyopathy	林煥淋醫師	
16:10~~	*Closing*		殷偉賢理事長

一、演講題目: Quantifications of AS and AR and TAVR

演講者：李慶威　台北榮總心臟科主治醫師

學歷：

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經歷

現職：

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- 迄今 臺北榮民總醫院 醫務企管部 主治醫師
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經歷：

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- 臺北榮民總醫院 內科部心臟科 總醫師
- 德國漢堡 Asklepio Klink St George 心臟內科臨床研究員

摘要：

主動脈瓣膜異常是常見的疾病，其狹窄或逆流可導因於年紀相關的退化或是先天構造的異常，重度的狹窄或逆流可以造成嚴重的生活功能缺損以及生命危險，故正確的診斷及處理相當重要.

超音波是早期診斷主動脈瓣膜疾病的不二選擇，具有非侵襲性、無風險,、以及可反覆施作等優點，但在實際操作中，需要充分了解各項超音波方法的標準及特性，才能避免誤差的產生。

今日的主體將重點分享使用心臟超音波診斷主動脈瓣狹窄、逆流、與混合性瓣膜疾病的方法。

二、演講題目: Quantifications of MR and MS

演講者：　李廣祚　林口長庚醫院心臟內科助理教授級主治醫師

學經歷：

CURRENT POSITION

AttendingPhysician, Assistant Professor

Vice Director of Echocardiography Laboratory

Departmentof Cardiology, Chang Gung Memorial Hospital, Linkou, Taiwan, 2010-

EDUCATION

BA, Mathematics, New York University, New York, NY, USA, 1994-1998

MD, College of Medicine, Chang Gung University, Taoyuan County, Taiwan, 1998-2005

摘要:

3D echocardiography has been proven to be useful for clarifying complicated cardiac anatomies and hemodynamics. Recently introduced real-time 3D TEE may overcome technical and quality problems and result in widespread use of 3D echocardiography in routine clinical settings.

3D echocardiography is able to provide intuitive recognition of cardiac structures from any spatial point of view and may provide complete information about absolute heart chamber volumes and functions. Although there are still limitations to the currently available 3D ultrasound methods due to its relatively low image quality and low time resolution, this method would be one of the ultimate goals of cardiac imaging. In light of the recent development of real-time 3D transesophageal echocardiography (TEE), this new imaging method may become a clinical standard within a few years

In general, there are two major definite advantages of 3D imaging over conventional 2D echocardiography as follows:

(1)Quantification of absolute cardiac chamber volumes, including left ventricle (LV), right ventricle (RV),

and left atrial (LA) volumes and their functions.
(2)Visualization of the 3D structure and dynamic motion images of the heart, especially heart valve structures.

三、演講題目：Left Ventricular Systolic Function
　　演講者：　洪明銳　　基隆長庚醫院副院長
學經歷：
教育
9/1983-6/1990 中山醫學大學醫學系畢業
9/2003-6/2010 長庚大學臨床醫學科學研究所博士
學術任命
2/2014-長庚大學醫學院 內科教授
醫院任命
9/2011-6/2016 基隆長庚醫院 教學部部長
7/2013-基隆長庚醫院 心臟內科教授級主治醫師
7/2016-6/2017 基隆長庚醫院 內科部部長
7/2017-基隆長庚醫院副院長
研究興趣
洪醫師的研究興趣主要集中在支配血管功能的 eNOS，特別是在動態冠狀動脈狹窄。他的實驗室試圖在探討冠狀動脈痙攣（動態冠狀動脈狹窄）的可能的病理生理機制。目前，洪醫師研究在冠心病患者血管痙攣的 Rho/Rho 激酶（ROCK）活性。在台灣他的實驗室是第一個研究 ROCK 活性導致冠脈痙攣患者。另外，洪醫師也有興趣在心臟功能評估採用經胸前心臟超音波，尤其著重於二維型變造影。他的心臟超音波實驗室試圖研究左右心室和慢性腎臟病左心房二維型變造影的變化。目前由一些醫院的補助和科技部補助支持他的研究工作。
摘要：
Assessment of left ventricular (LV) systolic function plays an important role in the diagnosis, management, and prognosis of patients with a wide variety of cardiovascular disease. Measurement of LV ejection fraction (LVEF) represents the most commonly reported measure of LV systolic performance. Parameters that directly measure myocardial contractility such as strain and strain rate may prove to be more sensitive, reliable, and reproducible, though their clinical roles have not been established. Two-dimensional transthoracic echocardiography is the most commonly preferred initial imaging modality due to widespread availability, portability, and negligible risk. Careful clinical judgement should be exercised when a test evaluating LV systolic function yields unexpected or discrepant results. Possible causes include technical difficulties (e.g., suboptimal image quality or image processing), inaccurate interpretation, or development of an unexpected clinical condition.

四、演講題目: Assessment of Diastolic Function
　　演講者： 廖若男　臺北榮民總醫院內科部心臟科主治醫師
　現職：
- 迄今 臺北榮民總醫院 內科部心臟科 主治醫師
- 迄今 國立陽明交通大學 醫學系 助理教授
學歷：
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經歷：
醫療專長
心律不整
心律調節器手術
心臟超音波
經食道超音波
摘要:
Diastolic function is an essential component in evaluation of patients presented with suspected heart failure. Echocardiography is the cornerstone for evaluation of diastolic function. Mitral inflow pattern by Doppler echocardiography and tissue Doppler are the two main tools for assessment of diastolic function. In 2015, ASE and EACVI published a new guideline and standard for the evaluation of left ventricular diastolic function by echocardiograph. Four key components including mitral annular velocity by tissue Doppler (E'), E/E', left atrial volume and pulmonary artery pressure were emphasized in the latest recommendation. In this presentation, basic concepts and latest update recommendation will be reviewed.

五、演講題目: Right Ventricular Systolic Function and Speckle Tracking Imaging
演講者： 蔡蕙如 麻豆新樓醫院心臟內科暨成人加護病房主任
現職：
* 麻豆新樓醫院心臟內科暨成人加護病房主任
* 麻豆新樓醫院心導管室主任
* 國立成功大學附設醫院心臟內科兼任主治醫師
學經歷:
* 國立成功大學醫學院醫學士
* 內科專科醫師暨台灣內科醫學會會員
* 心臟內科專科醫師暨中華民國心臟學會會員
* 美國超音波學會會員
* 歐洲心血管影像學會會員
* 台灣心臟超音波學會會員
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* 慈濟醫院大林分院心臟內科副主治醫師
* 國立成功大學附設醫院心臟內科研究員
* 國立成功大學附設醫院內科住院醫師、總住院醫師
摘要:
The right ventricle has an impact on cardiovascular morbidity and mortality. Cardiologists should always evaluate right ventricle in daily clinical practice. The echocardiographic assessment of right ventricle is based on qualitative and quantitative parameters. These parameters include a measure of right ventricular size, right atrial size, right ventricular systolic function (at least one of following: fractional area change, and tricuspid annular plane systolic excursion; with or without right index of myocardial performance, and pulmonary artery systolic pressure with estimate of right atrial pressure on the basis of inferior vena cava size and collapse. The current values are not indexed to body surface area or height; therefore, the available data are insufficient for the classification of the abnormal data into mild, moderate, and severe categories. Cardiologists and physicians should use their judgment in de-

termining the impact of data on individuals. As a result, all information should be obtained on echocardiographic examination of the right ventricle

六、演講題目：Endocarditis: Diagnosis, Evaluation and Management by Echocardiography

演講者： 楊甯貽 基隆長庚醫院心臟內科主治醫師

學經歷：

Education:

July 1991 – June 1996 University of Edinburgh Medical School, Scotland, UK

Employment Record :

July 1996 –June 1999: Junior / Senior House Officer, UK

July 1999 – June 2003: Resident, Department of Internal Medicine,
CGMH, Linkuo, Tao-Yuan, Taiwan

July 2003 – June 2005: Fellow in Cardiology, CGMH, Keelung, Taiwan

July 2005 – Present: Attending in Cardiology, CGMH, Keelung, Taiwan

Academic Appointment:

2010 Assistant Professor,
Chang Gung University, Chang Gung Memorial Hospital

Professional Activities: (Administrative Experience)

July 2005 - Present: Member, Evidence Based Medicine Committee, CGMH, Keelung, Taiwan

March 2006 - 2012: Deputy Secetary General, Taiwan Society of Echocardiography

March 2008 – 2016: Member, Internation Affairs and Public Relations Comittee, Taiwan Society of Cardiology

May 2008 - Present: Member, Medical Humanities, Ethics and Law Committee,CGMH, Keelung, Taiwan

July 2010 - 2011: Member, Medical Imaging Committee,
Taiwan Society of Cardiology

2012 July – 2014 June Chief of Cardiology,CGMH, Keelung, Taiwan

July 2016 – 2017 Associate Secretary General, Taiwan Society of Cardiology

摘要：

Infective endocarditis is a life-threatening disease associated with high mortality. Echo plays a key role in the diagnosing of endocarditis. One should know when to perform trans-thoracic and trans-esophageal echo, in addition to what are the limitations of each modality. For most patients with suspected IE, an initial TTE is usually recommended, especially in individuals without a prior TTE. When the TTE is nondiagnostic or if there is high clinical suspicion for IE, a TEE is recommended. TEE is recommended as the initial test for individuals with suspected IE involving a prosthetic heart valve in any location. Repeat TTE/TEE may be necessary in four to five days if IE is suspected and not identified by initial examination.

It is also important to be aware of the echocardiographic features that characterize vegetations, in addition to native valvular findings that may be confused with infective endocarditis. In addition to its role in diagnosing endocarditis, echo is important for recognizing the intracardiac complications associated with endocarditis, including regurgitant valve lesions, valve perforation, and abscess and fistula formation. Echo findings that suggest a need for surgery are severe valvular regurgitation with signs of heart failure, abscess, large vegetation (>10 mm), prosthesis dehiscence, or increase in vegetation size despite appropriate antibiotic therapy. Echo is also useful in assessing predictors of systemic embolism and stroke. It can also provide important information in the follow up of surgery and at the same time

provide prognostic information.

七、演講題目：Why Do We Need Strain Echocardiography?

演講者： 梁馨月 中國醫藥大學附設醫院內科部心臟血管系心臟影像科主任

學歷：

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美國約翰斯霍普金斯大學 醫學系 客座助理教授

摘要：

Coronary artery disease accounts for the majority of hospitalized patients. Coronary artery has distinctive distribution, and conventional echocardiography assesses ischemia based on systolic function, namely regional wall motion. However, regional wall motion evaluation is semi-quantitative, experience-dependent and subjective, therefore, it is used limitedly.

Strain and strain rate echocardiography evaluates deformation of myocardium during both systolic and diastolic phases, giving objective and quantitative data. In addition, this novel could distinguish acute ischemia, hibernation, and stunning in animal studies. In human study, strain echocardiography enables to demonstrate improved heart function after intervention. Due to high frame rate, up to 230/s, not only systolic event could be detected, but also diastolic event is also available using stain echocardiography, which could not be obtained using conventional echocardiography. Noise and time consuming are in process of revolution, using 2D speckle tracking.

So it is not surprised that strain echocardiography is getting important in daily practice

八、演講題目：Stress Echocardiography: An Overview

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摘要：

Stress echocardiography is now widely accepted in the USA for evaluating patients with coronary artery disease (CAD). However, conventional 2D stress echocardiography requires acquisition of at least four different 2D image planes, including parasternal long-axis and short-axis, and apical 4- and 2-chamber views to analyze all the LV segmental walls. Even with experienced sonographers, it usually takes about 20–30 s to obtain all four 2D images. This may lead to some images being acquired at submaximal heart rates at presumed “peak” heart rates. This limitation may reduce the specificity and sensitivity of stress echocardiography. Real-time 3D echocardiography is reportedly able to overcome

this limitation by its fast scanning of all the LV walls. Ahmad et al. reported that mean scanning time was 27 s by real-time 3D and 62 s by 2D echocardiography. In addition, in 90 patients who had coronary angiography, 3D echocardiography demonstrated higher sensitivity of 87% in the detection of CAD compared with 79% by 2D echocardiography. Simultaneous multiplane imaging in 3D space is now possible with a newer 3D platform. Thus, it may become realistic to employ real-time 3D echocardiography for clinical stress echocardiography.

九、演講題目：Diagnosis of Aortic Dissection, Atheroma and Intramural Hematoma: Role of Transthoracic and Transesophageal Echocardiography

演講者： 秦志輝 國泰綜合醫院教學部部主任
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國泰綜合醫院心血管中心副部主任
國泰綜合醫院一般心臟醫學科主任
輔仁大學醫學系專任助理教授
台灣心臟超音波學會理事
中華民國心臟學會監事
中華民國醫用超音波學會常務理事

摘要：
主動脈剝離及主動脈瘤是胸部主動脈的常見疾病。在臨床上也是對心血管外科以及心臟麻醉科醫師的重大挑戰。主動脈剝離，依照其 intimal tear 發生的部位，可以分類成 DeBakey 分類法中的 Type I、Type II 與 Type III，或是 Stanford 分類法中的 Type A 及 Type B。如 Intimal tear 發生於上昇主動脈時，應以外科手術方式治療，而如發生於下降主動脈時，則可先施予保守治療，並於疼痛、可能破裂、造成器官缺血等狀況時再進行手術。主動脈瘤之治療，則以外科手術為主，但手術時間，則與其大小有關。主動脈剝離之併發症包括心包填塞(cardiac tamponade)、主動脈瓣閉鎖不全、心肌及器官缺血。主動脈瘤為整個主動脈壁之膨出所造成，而假性動脈瘤(pseudoaneurysm)則常為胸部外傷或感染症所導致，且僅為部份動脈壁膨出。
主動脈剝離之診斷方法，包括電腦斷層攝影(CT)、血管攝影(Angiography)、經食道心臟超音波(TEE)以及磁振造影(MR)等方法。由於主動脈距離前胸較遠，因此極少使用胸前心臟超音波為診斷工具。雖然各種診斷工具各有其優劣，但如病人狀況較緊急時，TEE 可於床邊迅速執行。如於心臟手術麻醉後，更有極高之診斷正確率。由於 TEE 探頭與心臟距離近，因此影像極為清晰。而且對於併發症例如主動脈瓣閉鎖不全，亦可即時提供診斷，因此對於外科手術治療方式之選擇有極大助益。
TEE 於開心手術中之使用，亦可有助於一較罕見心臟手術併發症－手術中主動脈剝離(intraoperative aortic dissection)之早期診斷。手術中主動脈剝離，早期僅依賴外科醫師之觸診進行診斷，且如治療其死亡率甚高。惟其在手術中之診斷，仍有賴醫師於進行 TEE 檢查是，於手術前及手術後，均進行詳細之上昇及下降主動脈之檢查。根據我們過去病例之回顧，發現心臟手術中之主動脈剝離，多與上昇主動脈中之體外循環導管拔除有關。但亦有一病例係於不停跳開心手術中，使用 partial aortic clamp 進行隱靜脈及主動脈吻合時所造成。而在檢查時則尤應注意主動脈後壁之變化。以避免錯失主動脈剝離之診斷。

十、演講題目：主動脈瓣膜疾病

演講者： 秦志輝 國泰綜合醫院教學部部主任
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國泰綜合醫院教學部部主任

國泰綜合醫院心血管中心副部主任
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輔仁大學醫學系專任助理教授
台灣心臟超音波學會理事
中華民國心臟學會監事
中華民國醫用超音波學會常務理事
摘要：
Echocardiography is the most effective means of evaluating the aortic valve in normal and diseased states. For most conditions, transthoracic echocardiography (TTE) is sufficient. Congenital, degenerative, and inflammatory lesions are readily recognized and their severity graded. In addition, it is standard practice for TTE to be the sole method of serial evaluation of aortic stenosis (AS) and aortic regurgitation (AR).
Medical and interventional approaches to the management of patients with valvular AS depend on accurate diagnosis of the cause and stage of the disease process. Hemodynamic severity is best characterized by the transaortic maximum velocity (or mean pressure gradient) when the transaortic volume flow rate is normal. Some patients with AS have a low transaortic volume flow rate that is either because of LV systolic dysfunction with a low LVEF or because of a small, hypertrophied LV with a low stroke volume. Severe AS with low flow is designated D2 (with a low LVEF) or D3 (with a normal LVEF). Meticulous attention to detail is required during assessment of aortic valve hemodynamics, either with Doppler echocardiography or cardiac catheterization, and the inherent variability of the measurements and calculations should always be considered in clinical decision-making.
TTE or TEE is indispensable in confirming the presence, severity, and etiology of acute AR; determining whether there is rapid equilibration of the aortic and LV diastolic pressures; visualizing the aortic root; and evaluating LV size and systolic function. The most common causes of chronic severe AR in the United States and other high-income countries are bicuspid valve disease and primary diseases of the ascending aorta or the sinuses of Valsalva. Rheumatic heart disease is the leading cause of AR in many low- to middle-income countries. TTE provides diagnostic information about the etiology and mechanism of AR (including valve reparability), severity of regurgitation, morphology of the ascending aorta, and LV response to the increases in preload and afterload. Imaging with TEE, CMR, or aortic angiography provides additional information when needed.

十一、演講題目：Cardiac Tumors and Thrombus: Differential Diagnosis and Evaluation
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學歷
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摘要：Detection of a cardiac mass is an impressive experience for clinical echocardiographers but it continues to captivate the attention each time encountered. Some cardiac masses are suspected from the presentation of the patient but most cardiac masses are found incidentally. Occasionally, a normal structure or variant may appear as an intracardiac mass. As an abnormal structure within or adjacent to the heart, cardiac mass can be classified as a cardiac tumor, thrombus, vegetation, iatrogenic material, normal variant, or extracardiac structure. Echocardiography allows for dynamic evaluation of cardiac masses, with an advantage over other tomographic images in that assessing both the anatomic extent and the physiologic consequences of the mass is possible. Following a careful assessment, echocardiography provides valuable diagnostic information regarding the mass etiology and greatly facilitates subsequent therapy. These masses can normally be differentiated based on their size, shape, location, mobility, and attachment site as well as their presentation. Limitations of echocardiography include suboptimal image quality in some patients, possibility of mistaking an ultrasound artifact for an anatomic mass, and inability to provide histologic diagnosis. Accurate diagnosis is vital to ensure an accurate management strategy.

十二、演講題目：Prosthetic Valves: 2-D and Doppler Approach for Evaluating of Normal Prosthetic Valve and Valve Dysfunction (TTE and TEE)

演講者： 李道輿 高雄榮民總醫院心臟內科主治醫師

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摘要：
Echocardiography may identify patients with a high or low probability of disease in a wide range of pretest probabilities of disease (20–70%). These excellent results can be achieved if echocardiography has a sensitivity and specificity of 90% and 97%, respectively. Thus, it is important to obtain high quality examinations, regardless of the type of echocardiogram, either TTE or TEE. TEE provides high quality data with a better sensitivity. In our study, TEE was immediately performed in patients with prosthetic valves or intracardiac devices, and it was performed after low quality or negative TTE, when the pretest probability of disease was intermediate to high (more than two Duke minor criteria). A positive TTE of good quality, however, has often been sufficient for diagnostic purposes, because of the high specificity. Nevertheless, we often performed TEE in order to complete the study for left-sided IE. In this setting, echocardiography should be performed as soon as possible, and in all cases within 24–48 h of the clinical suspicion of IE. The echocardiogram has a strong clinical impact and may guide clinicians to the appropriate therapy (early empiric antibiotic therapy, surgical option, need for further diagnostic tests in doubtful or negative cases), or towards other diseases. After this preliminary phase, a definite diagnosis should, however, be reached by defining disease etiology whenever possible, using either the Duke criteria or any other diagnostic tool. The underlying diagnostic approach may be valuable in clinical practice to optimize early management of IE.

十三、演講題目：Ischemic Mitral Regurgitation

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摘要：

Ischemic mitral regurgitation (IMR), with a conservatively estimated prevalence of 1.6 million to 2.9 million patients in the United States, is currently present in 10 percent to 20 percent of patients with coronary artery disease (CAD). Despite the large number of patients, there remains relative scarce data regarding effective treatment delivery and currently there is a lack of a unifying definition throughout the literature.

Not until recently, the pathophysiology was understood and delineated more comprehensively, in part driven by the more advanced echocardiography techniques, especially 3D based algorithms and more quantitative descriptional analysis. This progress has resulted in success in surgical strategies with more optimal results and post-surgical durability. Therefore, the surgical approach has evolved from merely revascularization alone to an additional mitral valve procedure, replacement, or repair.

In this lecture, we will address the possible pathological mechanisms underlying IMR more up to date, and further reviewed the newly developed diagnostic tools, mostly based on 3D algorithms.we will further explore several related randomized trials results and related research which may possibly enlighten or bring us new insights into a better understanding if this clinical picture in daily practice.

十四、 演講題目：Hypertrophy Cardiomypathy

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Ph.D., Graduate Institute of Clinical Medicine, National Taiwan University College of Medicine, 2005.

Concentrations: Cardiac imaging, Echocardiography.

Dissertation: Ultrasonic Integrated Backscatter Imaging Characterizing Myocardium: The Clinical Implications and Applications for Cellular Biology.

M.D., National Taiwan University College of Medicine, 1991.

Professional Experience:

Vice President of Taiwan Society of Echocardiography

Chairman of Cardiac Image Committee, Taiwan Society of Cardiology

Board of Directors, Chairman of Informatics Committee, Society of Ultrasound in Medicine R.O.C.

Managing Supervisor, Taiwan Association of Interventional and Therapeutic Ultrasound

摘要：Hypertrophic cardiomyopathy (HCM), especially in terms of the risk of sudden cardiac death and the clinical presentation by obstruction, has increasingly become a treatable condition with good long-term prognosis. Septal reduction by surgery or alcohol ablation is indicated in patients with symptoms refractory to medications. Besides the left ventricular (LV) septum, mitral valve and subvalvular apparatus are vital to determine the pathophysiology of LV obstruction and mitral regurgitation (MR), which make combined myectomy and mitral operations appropriate in carefully selected patients. Echocardiography has played the greatest single role in assisting clinicians in the diagnosis and management of the complex manifestations.

十五、演講題目：Contrast Echocardiography

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2015.04~ 2016.05 英國牛津大學心臟醫學中心 Oxford Heart Center 進修

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2013.07~ 迄今 中華民國考選部國家醫師考試 OSCE 考官

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摘要：

Contrast echocardiography is a technique for improving echocardiographic resolution and providing real time assessment of intracardiac blood flow. Agitated saline contrast provides contrast in the right heart and enables detection of right to left shunts. Opacification of the left ventricular (LV) cavity by contrast agents developed to traverse the pulmonary vasculature permits improved endocardial border detection [1]. Contrast echocardiography can also enhance delineation of Doppler signal . Additional uses of contrast echocardiography are to assess myocardial perfusion and viability .

The development and safety of microbubbles for echocardiographic contrast and the optimization of the echocardiographic settings for visualizing contrast will be reviewed here. The current and potential clinical applications of CE are discussed separately.

16、演講題目: Common Congenital Heart Defects in the Adult Diagnosis,
Evaluations by 2-D and Doppler Echo

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1975-1980 National Defense Medical Center, Taipei, Taiwan

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1982-1985 Tri-Service General Hospital, Taipei, Taiwan Rotating Residency in Pediatrics

1985-1987 Tri-Service General Hospital, Taipei, Taiwan Senior Residency in Pediatric Cardiology

1987-1988 Tri-Service General Hospital, Taipei, Taiwan Chief Residency of Department of Pediatrics

1990-1991 Research Fellow in Cardiovascular Research Institute, University of California, San Francisco
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Licensure and certification

1982~ National Board of Medical Examination, Taiwan

1982~ ECFMG, medical part

1986~ Certified Board in Pediatrics, Pediatric Association of Taiwan

1987~ Certified Sub-Board in Pediatric Cardiology, Taiwan Society of Cardiology

1993~ Certified Board in Neonatology, Taiwan

1995~ Certified Board in Pediatric Emergency and Critical Care

1996~ Certified Instructor in Advanced Cardiac Life Support Course

摘要：

Atrial Septal Defect

(1) secundum,

(2) primum or partial atrioventricular canal

(3) sinus venosus,

(4) coronary sinus atrial septal defect.

A complete TTE examination can detect most primum and secundum atrial septal defects, but sinus venosus defect is visualized in only about 70 percent of patients.

TEE is exquisitely sensitive for the identification of all types of atrial septal defect, as well as associated anomalous pulmonary venous connections.

Each form of atrial septal defect is normally associated with a left-to-right shunt, which eventually results in RA and RV volume overload.

It is not necessary or recommended to quantify shunt volume by Doppler measurements.

These assessments are often inaccurate because of the number of component measurements involved in the calculation of multiple stroke volumes.

The TTE finding of an atrial septal defect with associated right-heart enlargement is enough to warrant closure of the defect in the absence of pulmonary hypertension.

Pulmonary hypertension of a magnitude that would preclude surgical or device closure is rare and can be recognized on 2D and Doppler echocardiography studies.

Confirmation of fixed pulmonary hypertension requires cardiac catheterization and hemodynamic assessment.

Routine cardiac catheterization is not required to establish the diagnosis of atrial septal defect.

Ventricular Septal Defect (VSD)

Ventricular septal defects are common, occurring in approximately 20 to 25 percent of patients with congenital heart disease.

Often, they are small, isolated defects that cause no symptoms, but multiple ventricular septal defects may occur in the same patient.

Large ventricular septal defects cause a large left-to-right shunt and pulmonary hypertension.

Left-heart volume overload and RV hypertrophy are features that should suggest the presence of a large ventricular septal defect.

If unrepaired, large defects may cause irreversible pulmonary vascular obstructive disease, even in young children. These defects can occur in various locations in the ventricular septum.

There are four major categories of ventricular septal defect:

The most common type in adults is the membranous type.

These are located at the junction of the muscular, atrioventricular, and outlet portions of the septum.

They are adjacent to the aortic and tricuspid valves, which may eventually cause aortic or tricuspid valve regurgitation; thus, prolonged echocardiographic surveillance is recommended.

The most common ventricular septal defect in newborn is the muscular type.

They are most often located in the apical two thirds of the ventricular septum. Remote from any cardiac valve, they are not associated with progressive valve dysfunction.

Most of these defects are small and close spontaneously early in life.

A large muscular ventricular septal defect can cause a large left-to-right shunt, with eventual pulmonary hypertension.

The third most frequent type of ventricular septal defect is the one seen with complete atrioventricular septal defects.

This type usually occurs as part of a complete atrioventricular canal defect, but occasionally it may be seen in isolation.

The supracristal, or subarterial, ventricular septal defect is rare.

It is located in the outlet septum, immediately adjacent to both the aortic and pulmonary valve annulus at the base of the heart.

As a result, the right aortic cusp may be unsupported and prolapse into the ventricular septal defect.

Aortic cusp prolapse restricts the functional size of the defect but distorts the aortic valve and is associated with aortic valve regurgitation. Elective repair of this ventricular septal defect is usually

recommended to prevent progressive aortic cusp prolapse and regurgitation.

A comprehensive TTE examination can identify a ventricular septal defect in more than 90 percent of cases.

Continuous wave Doppler echocardiography can measure the blood flow velocity and gradient across the defect.

A large ventricular septal defect will have a smaller pressure difference between the ventricles; conversely, a small defect would have a large gradient (i.e., velocity).

Rarely, TEE is used to improve imaging in patients with a known or suspected ventricular septal defect.

Patent Ductus Arteriosus

Patent ductus arteriosus is an arterial communication between the upper descending aorta and the distal main pulmonary artery, near the origin of the left pulmonary artery.

Echocardiographic diagnosis is based on demonstrating a persistent anatomical connection and flow between the descending thoracic aorta and the pulmonary artery.

The best imaging views include the high left parasternal long-axis scan of the RVOT and main pulmonary artery and the suprasternal view.

A patent ductus arteriosus associated with pulmonary hypertension may be difficult to visualize with TTE or TEE because of equalization of pressures between the two vessels.

High Doppler velocities across the patent ductus suggest low pulmonary artery pressure.

十七、演講題目: 3D Echo: An Overview

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胸前及經食道超音波

複雜性結構性心臟病影像分析判讀(包括經導管瓣膜介入、先天及後天性心臟疾病)

摘要:

3D echocardiography has been proven to be useful for clarifying complicated cardiac anatomies and hemodynamics. Recently introduced real-time 3D TEE may overcome technical and quality problems and result in widespread use of 3D echocardiography in routine clinical settings.

3D echocardiography is able to provide intuitive recognition of cardiac structures from any spatial point of view and may provide complete information about absolute heart chamber volumes and functions. Although there are still limitations to the currently available 3D ultrasound methods due to its relatively low image quality and low time resolution, this method would be one of the ultimate goals of cardiac imaging. In light of the recent development of real-time 3D transesophageal echocardiography (TEE), this new imaging method may become a clinical standard within a few years

In general, there are two major definite advantages of 3D imaging over conventional 2D echocardiography as follows:

(1)Quantification of absolute cardiac chamber volumes, including left ventricle (LV), right ventricle (RV), and left atrial (LA) volumes and their functions.

(2)Visualization of the 3D structure and dynamic motion images of the heart, especially heart valve structures.

十八、演講題目: Constructive pericarditis vs Restructive Cardiomypathy

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心導管冠狀動脈支架置入術
胸前及經食道超音波
複雜性結構性心臟病影像分析判讀(包括經導管瓣膜介入、先天及後天性心臟疾病)

摘要:
Constrictive pericarditis is caused by a variety of etiologies resulting in inflamed, scarred, thickened, or calcified pericardium. When the abnormal pericardium limits diastolic filling, there are a series of hemodynamic consequences. Since the hemodynamic and clinical features are similar between constrictive pericarditis from a myocardial disease, it is often challenging to distinguish between the two categories. Even the traditional invasive hemodynamic criteria of "equalization of end-diastolic pressures" is not specific for constrictive pericarditis. Despite many similarities between myocardial and pericardial diseases, there are several unique features of constriction that allow a reliable diagnosis. Those features are 1. Respiratory variation in ventricular filling 2. Interventricular dependence and 3. Augmented longitudinal motion of the heart.
The reduction in left heart filling during inspiration causes a reduction in mitral inflow velocity and a shift of the interventricular septum toward the left ventricle. With expiration, left heart filling increases which shifts the interventricular septum back toward the right ventricle, leading to reduced filling to right side of the heart and a late-diastolic reversal of flow in the hepatic veins. Besides, a plethoric inferior vena cava can be found in echo findings as the character in most restrictive cardiomyopathy. It may appear dilated or collapse insufficiently during inspiration. This is the echocardiographic marker for increased venous pressure.
The advent of tissue Doppler imaging has provided increased diagnostic confidence to separate constriction from a myocardial disease. The early diastolic mitral annular velocity (e') which reflects the status of LV myocardial relaxation is reduced in most forms of heart failure related to myocardial disease, including restrictive cardiomyopathy. The normal e' velocity from the medial mitral annulus is 9 cm/sec or greater, and it is usually 6cm/sec or less in patients with a myopathy. In contrast, e' is usually preserved or even increased in constrictive pericarditis since the lateral motion of the heart is limited by the constrictive pericardium. Furthermore, the medial mitral annular e' velocity is usually greater than the lateral mitral annular e', which is usually reversed in cases other forms of heart failure.
Restrictive cardiomyopathy is a myocardial disease of various etiologies, such as amyloidosis, hypereosinophilic syndrome, sarcoidosis, etc. It is characterized by normal LV systolic function with impaired diastolic function due to stiff and thickened myocardium. In most restrictive cardiomyopathy patients, the LV diastolic pressure is higher than the right. Right side heart failure appear with lower atrial pressure and therefore appear earlier in the course of the disease. In the presence of poor ventricular compliance, atrial fibrillation may lead to further deterioration of ventricular filling. Besides intracardi-

ac clot formation in hypereosinophilic syndrome, atrial fibrillation may be further complicated by blood clot formation in either atrium or atrial appendage with central or peripheral embolic events. The comparison of restrictive cardiomyopathy and constrictive pericarditis will be further demonstrated.