

中華民國醫用超音波學會 2022 年第二次學術研討會暨
第十九屆北區會員代表選舉
臺大醫學院基礎醫學大樓
111 年 7 月 17 日(星期日)

會長：楊培銘教授
節目籌備人員：王秀伯主任、林隆君醫師、蕭勝文主任、連琬菁醫師
內容：消化系、心臟內科、婦產科、急診醫學科
會議地點：臺大醫學院基礎醫學大樓 101、102、103、104 講堂
(臺北市仁愛路一段一號)
報到處：臺大醫學院基礎醫學大樓 102 講堂外
報到及投票時間：臺大醫學院 203 講堂 12:30-16:00
報到費：會員/會友免費 非會員伍佰元
主辦單位：中華民國醫用超音波學會

消化系超音波研討會：

101 講堂

Key Practice of Ultrasound in Gastroenterology

時 間	頁	題 目
主持人：陳冠仰院長 臺北市立聯合醫院陽明院區 陳建華主任 臺北慈濟醫院		
13:30-14:00	1	Contrast Enhanced Ultrasound for Digestive Diseases 王秀伯主任 臺大醫院
14:00-14:30	2	Abdominal Ultrasound for Pancreatic Tumors – What to Know? 黃永輝醫師 臺大醫院
14:30-15:00	2	Abdominal Ultrasound for Biliary Diseases – What to Know? 孫灼基主任 新光醫院
15:00-15:20	Coffee Break	
主持人：林錫銘主任 林口長庚醫院 王秀伯主任 臺大醫院		
15:20-15:50	3	Ultrasound Guided Liver Intervention 徐士哲醫師 臺大醫院
15:50-16:20	3	EUS-guided Tissue Acquisition – How Far We Go? 郭雨庭醫師 臺大醫院
16:20-16:50	4	EUS-guided Liver Intervention 陳建華主任 臺北慈濟醫院
16:50-17:00		Closing Remarks 王秀伯主任 臺大醫院

婦產科超音波研討會：

102 講堂

時 間	頁	題 目
主持人：蕭勝文主任 臺北長庚醫院 陳震宇主任 臺北馬偕醫院		
13:30-14:00	5	Intrapartum Ultrasound in Clinical Practice 黃冠穎醫師 臺大醫院新竹分院
14:00-14:30	5	Congenital Diaphragmatic Hernia 莊雅淳醫師 臺北長庚醫院
14:30-14:50	Coffee Break	

續後頁

婦產科超音波研討會：**102 講堂**

主持人：葉長青醫師 臺北榮民總醫院 蕭國明醫師 新光醫院		
14:50-15:20	6	Contemporary Ultrasound Models to Diagnose Adnexal Malignancy 陳冠宇醫師 臺北榮民總醫院
15:20-15:50	7	婦產科超音波於女性不孕症上的應用 Sonography Gynecology : Female Infertility Applications 李毅評主任 新光醫院
15:50-16:00		Discussion

心臟超音波研討會：**103 講堂**

Recent Progress in Echocardiography

時 間	頁	題 目
主持人：褚柏顯主任 林口長庚醫院		
13:30-14:00	8	Clinical Applications of the Non-invasive Assessment of Myocardial Work by Pressure-strain Analysis 王俊力主任 林口長庚醫院
主持人：洪國竣主任 林口長庚醫院		
14:00-14:30	8	Application of AI-assisted Identification of HF Phenotypes 洪崇烈主任 馬偕醫院
主持人：徐粹烈醫師 振興醫院		
14:30-15:00	9	3D TEE in Interventional Echocardiography 余文鍾醫師 臺北榮民總醫院
15:00-15:20		Coffee Break
主持人：江正文教授 國泰醫院		
15:20-15:50	9	Clinical Applications of Contrast Echocardiography 秦志輝主任 國泰醫院
主持人：林隆君醫師 臺大醫院		
15:50-16:20	10	Echo in Transcatheter VSD Closure 陳俊安醫師 臺大醫院

急診科超音波研討會：**104 講堂**

New advances in Emergency Ultrasound

時 間	頁	題 目
主持人：連琬菁醫師 臺大醫院		
13:30-14:00	11	TEE during Cardiac Arrest:Case-sharing 黃俊諺主任 亞東醫院
14:00-14:30	11	超音波於蛇咬傷的臨床應用 何政軒主任 三軍總醫院
14:30-15:00	12	The Impact of Point-of-care Ultrasound for Patients with Acute Flank Pain--Earlier point-of-care Ultrasound, Shorter Length of Stay in Patients with Acute Flank Pain 王貝琇醫師 臺大醫院
15:00-15:20		Coffee Break
15:20-15:50	13	Echocardiography in Patients with Acute Ischemic Stroke in Emergency Department 柯穎志醫師 臺大醫院
15:50-16:20	13	Comprehensive Residency-based Point-of-care Ultrasound Training Program Increases Ultrasound Utilization in the Emergency Department 鍾睿元醫師 國泰醫院

Contrast Enhanced Ultrasound for Digestive Diseases

王秀伯教授

National Taiwan University Hospital

Contrast-enhanced ultrasound (CEUS) has been used for imaging the liver and other digestive organs for years. CEUS is most often used for imaging the liver, but it is also used to image other gastrointestinal organs.

Ultrasound contrast agents are used to improve visualization and characterization of anatomic structures and lesions. Ultrasound contrast agents are microbubbles with 1 to 10 microns in size and permit real-time visualization of both the larger blood vessels and the microvasculature of the lesions at the arterial and venous phases, and in the case of the liver, the portal-venous phase. For transcutaneous contrast-enhanced ultrasound (CEUS), we use 0.7 ml Sonazoid 2nd generation. Different enhancement patterns can help identify a lesion's vascular composition, which can assist with lesion characterization.

Application of ultrasound contrast agents to non-hepatic digestive organs including pancreas, biliary, GI tract and spleen.

The application of ultrasound contrast agents to evaluate a focal pancreatic lesion that is indeterminate on computed tomography (CT) or magnetic resonance imaging (MRI) such as pancreatic ductal adenocarcinoma, hyperenhancing solid pancreatic lesion (neuroendocrine tumor), mass-forming chronic pancreatitis and autoimmune pancreatitis. Besides the pancreatic solid lesions, to differentiate the content or solid nodules in the cystic lesions is another important application of ultrasound contrast agents. The pancreatic cystic lesions may include pseudocyst or walled-off pancreatic necrosis, serous cystadenoma, mucinous cystadenoma/cystadenocarcinoma, intraductal papillary mucinous neoplasm (IPMN).

Application on biliary system is less than pancreas and may include gallbladder polyp/tumor, bile duct cancer, content of bile duct (mucin vs tumor) and the severity of cholecystitis.

The application of ultrasound contrast agents to gastrointestinal tract include inflammatory bowel disease (IBD) (disease activity, perienteric abscesses, inflammatory masses, fistulas and stenosis) and other tumor vs inflammation. Besides IBD, enhancing GI tract tumors such as GIST and NET are characterized well by ultrasound contrast agents.

CEUS can be used in suspected intraabdominal trauma-related laceration and/or bleeding of parenchymal organs (eg, spleen, liver and kidney) and to evaluate peritoneal bleeding.

To summary, the CEUS can be apply to many non-hepatic digestive lesions. But standardization of application and more evidence is needed.

Abdominal Ultrasound for Pancreatic Tumors – What to Know?

黃永輝醫師
台大醫院綜合診療部超音波科

胰臟的疾病種類繁多，從先天構造異常（如環狀胰臟）、良性的胰臟病灶（如自體免疫胰臟炎、胰臟水泡）、以至於讓人聞之色變的癌中之王胰臟腺癌等，都能由超音波所偵測。超音波是非侵入性的檢查，不具有放射線、方便且可以反覆安全地進行，只是由於胰臟是位於後腹腔的器官，常常容易受到前方腸氣的干擾而不易觀察，因此要在腹部超音波檢查中完全展現胰臟的全貌並不容易。希望藉由個人經驗與大家分享胰臟檢查的技巧，再加上間接證據（indirect signs）的輔助，識別出有需要被進一步檢查的病人，達到早期偵測與治療的目的。

Abdominal Ultrasound for Biliary Diseases – What to Know?

孫灼基主任
新光醫院肝膽胃腸科

Abdominal ultrasonography is the procedure of choice for screening for biliary tract abnormalities, evaluating the hepatobiliary tract in patients with right upper quadrant abdominal pain, differentiating intrahepatic from extrahepatic causes of jaundice. It is the least expensive, noninvasive, and most sensitive technique for imaging the biliary system, especially the gallbladder. Ultrasonography provides structural, but not functional, information.

Ultrasonography can be difficult in patients with intestinal gas or obesity and is operator-dependent. Gallstones cast intense echoes with acoustic shadowing that move with gravity. Abdominal ultrasonography is extremely accurate (sensitivity > 95%) for gallstones > 2 mm in diameter. Ultrasonography can also determine biliary sludge (a mixture of particulate material and bile) as low-level echoes that layer in the dependent portion of the gallbladder without acoustic shadowing. The presentations of cholecystitis under ultrasonography including a thickened gallbladder wall (> 3 mm), pericholecystic fluid, an impacted stone in the gallbladder neck and sonographic Murphy's sign is defined as maximal abdominal tenderness from pressure of the ultrasound probe over the visualized gallbladder.

Extrahepatic obstruction is indicated by dilated bile ducts. On ultrasounds, bile ducts stand out as echo-free tubular structures. The diameter of the common duct is normally < 6 mm, increases slightly with age, and can reach 10 mm after cholecystectomy. Dilated ducts may be associated with pathognomonic for extrahepatic obstruction in the appropriate clinical signs and symptoms. But ultrasonography may miss early or intermittent obstruction that does not dilate the ducts. However, abdominal ultrasonography is an effective tool to demonstrate the biliary diseases.

Ultrasound Guided Liver Intervention

徐士哲醫師

Department of Internal Medicine, National Taiwan University Hospital

Ultrasound can depict the anatomical details of solid organs in a real-time manner. Hence it is a useful tool for diagnostic and therapeutic interventions of liver diseases, including acute hepatitis, chronic liver disease and focal liver lesion. A variety of procedures can be confidently performed with the guidance of ultrasound, such as tissue sampling, drainage of fluid cavity or ablation of focal lesion. In this lecture, the indications, contraindications, equipment factors and key steps of these procedures will be introduced through literature review and case demonstration. To avoid unwanted complications, it is also important to be familiar with the possible pitfalls and caveats related to the procedures.

EUS-guided Tissue Acquisition – How Far We Go?

郭雨庭醫師

Division of Endoscopy, Department of Integrated Diagnostics & Therapeutics,
National Taiwan University College of Medicine, Taipei, Taiwan

Endoscopic ultrasound (EUS) is an interesting diagnostic as well as interventional modality arising after amalgamation of endoscopy and ultrasound that has changed the way gastrointestinal (GI) endoscopy is practiced today. It initially started as a pure diagnostic imaging modality when, in 1980, for the first time an ultrasonography probe was attached to an endoscope and used as EUS. However, with subsequent advancements, EUS-guided fine needle aspiration (FNA) for tissue acquisition (TA) became its predominant role in clinical practice. EUS-TA has made the pathological diagnosis by means of TA in otherwise difficult anatomic locations within abdomen, retroperitoneum, mediastinum, and perirectal space easy. Recently, EUS-FNB needles have been developed to improve specimen acquisition and diagnostic abilities and FNB needles are currently classified into Franseen, Fork-tip, Forward-bevel, and Reverse-bevel types according to the shape of needle tip. EUS-FNB sampling using a core needle has a theoretical advantage over FNA by providing increased amounts of tissue with preserved architecture, thereby making an initial positive diagnosis more likely. Although there is heterogeneity in the results among studies, EUS-FNB is generally superior to EUS-FNA in terms of diagnostic accuracy, specimen adequacy, and number of needle passes, and is equivalent in adverse events.

In addition to pathological diagnosis, EUS-TA had a potential role to provide precision medicine referring to the ability to use patient-specific information (eg, genomic or proteomic) in effort to guide the clinician in making customized diagnostic or therapeutic decisions. The primary example of precision medicine in pancreatic cancer today is next-generation sequencing (NGS). The information can be used in the selection of various chemotherapy regimens known to be more effective in the presence of specific types of pancreatic tumors. Optimizing tissue procurement for NGS and other ancillary studies will only become more important for patients with pancreatic cancer in the future as oncologists increasingly utilize these studies to identify targeted therapies.

EUS-guided Liver Intervention

陳建華主任
臺北慈濟醫院肝膽胃腸科

Lesions such as hepatocellular carcinoma (HCC) or other entities at the caudate lobe were located at the deep site of liver, which was not visualized well by transabdominal ultrasound, and there were intervening veins that would have made it not only difficult but also hazardous to attempt percutaneous ablative treatment due to the long trajectory. Endoscopic ultrasonography (EUS) has emerged as a highly sophisticated interventional modality. EUS guided therapy provide the best solution to treat the caudate lobe lesion, i.e., in close proximity to the stomach, which made it easily accessible by EUS. EUS have been developed for the interventional purpose in addition to the pancreatic disease. EUS-guided liver biopsy, abscess aspiration or ethanol injection or radiofrequency ablation for HCC, owing to its less invasiveness, appears to be a new innovative option for lesions that is difficult to treat by local percutaneous treatment.

Intrapartum Ultrasound in Clinical Practice

黃冠穎醫師
台大醫院新竹分院婦產部

Traditionally, the assessment and management of a woman in labor is based on digital evaluation of cervical dilatation and fetal head station and position, which diagnosed arrest of labor.

Correct determination of head position is important before instrumental delivery. An error in evaluation of head position may result in inappropriate vacuum usage, increasing the potential for fetal injury and the failure rate of the procedure. Failed instrumental delivery followed by Cesarean section is associated with an increased delivery time and an increased risk of maternal and fetal trauma.

So far, by using the intrapartum transperineal ultrasound, we can access the fetal head position and station. We can have several parameters included head-perineum distance and head symphysis distance, fetal head flexion degree, and angle of progression and midline angle. With these parameters, we can predict the likelihood of spontaneous vaginal delivery, make our decision more precisely and decreased the risk of maternal and fetal trauma.

Congenital Diaphragmatic Hernia

莊雅淳醫師
基隆長庚紀念醫院婦產科

Congenital diaphragmatic hernia (CDH) is a developmental discontinuity of the diaphragm that allows the abdominal viscera to herniate into the chest. The prevalence of CDH is approximately 1 to 4 cases per 10,000 live births. Although the diaphragmatic defect is surgically correctable, in utero herniation of viscera can result in pulmonary hypoplasia and pulmonary hypertension. Failure of normal closure of the pleuroperitoneal folds during the fourth to tenth weeks postfertilization allows herniation viscera into the thoracic cavity which interferes normal bronchi and pulmonary arteries branching. The spectrum and severity of adverse effects in an affected fetus depends on the gestational age when the viscera herniate.

Approximately 95 percent of the diaphragmatic defects are posterolateral. Left side diaphragm defect was found in 80 to 85 percent of cases while right side diaphragm defect happened in 10 to 15 percent of cases. Left side diaphragm defect most often involves displacement of the stomach while right-sided herniation almost always involves upward displacement of the liver. Abnormal pulmonary vascular development and function can occur bilaterally. Poor pulmonary blood flow results from a reduction in the cross-sectional area of the pulmonary vascular bed in the hypoplastic lungs. Over 60 percent of CDH cases are initially suspected on a routine 18 to 22 week sonographic fetal anatomic survey. The definitive sonographic diagnosis of fetal CDH relies on the visualization of abdominal organs in the fetal chest. Other accompanied finding includes polyhydramnios or (rarely) hydrops and absence of fluid-filled stomach in the abdominal cavity. Right mediastinal shift may be found in left side congenital diaphragm hernia cases. Color Doppler ultrasound can be used

to document the location of the liver by demonstrating the course of the intrahepatic vessels. CDH may be an isolated anomaly or part of a syndrome. Approximately 30 to 70 percent CDH is isolated CDH whereas 30 to 50 percent of CDH cases are complex. Conventional karyotypic abnormalities and detailed sonographic fetal anatomic survey may be indicated in CDH cases. Prognosis of CDH varies with worse prognosis happened in the patient with abnormal chromosomal microarray, severe associated anomalies, and lower fetal lung volume. Fetal endoscopic tracheal occlusion (FETO) in poor prognosis CDH may increase transpulmonic pressure and preventing the abnormal development of lung which is seen in CDH. In most patients, vaginal delivery is indicated if there is no any Cesarean section indications found. Delivery should occur at a medical center with the expertise for performing corrective surgery.

Contemporary Ultrasound Models to Diagnose Adnexal Malignancy

陳冠宇醫師
臺北榮民總醫院婦產部

Ultrasonography is the first-line imaging tool for the evaluation of adnexal lesions. Most adnexal lesions are physiological changes or typical benign lesions with a low malignancy potential. Challenges remain in evaluating the malignancy risk when facing non-typical adnexal lesions. Ovarian cancer (OC) has a low prevalence; however, it is highly lethal. The overall five-year survival rate of patients with OC is less than half. Therefore, the accurate diagnosis of adnexal lesions plays a vital role in patient management.

In recent years, several ultrasound-structured reporting systems have been developed to assess the risk of OC. In 2000, the International Ovarian Tumor Analysis (IOTA) group presented the terminology and definitions to describe sonographic features of adnexal tumors, and subsequently developed the “Logistic Regression Model” in 2005, “Simple-Rules” in 2008, “ADNEX Model” in 2014, and “Simple-Rules-Risk model (SR-Risk)” in 2016. Other prediction models, such as the Gynecology Imaging Reporting Data System (GI-RADS), were developed in 2009. Recently, a large multicenter study that included 4905 patients with adnexal lesions undergoing surgery compared the performance of six prediction models for ovarian malignancy and concluded that the ADNEX model had more practical advantages than other models. In 2018, the American College of Radiology (ACR) published a white paper lexicon describing adnexal lesions. In 2020, the ACR developed the Ovarian-Adnexal Reporting and Data System (O-RADS) ultrasound risk classification.

In this section, we will introduce current contemporary ultrasound models to easily access the adnexal lesions between benign and malignant.

Sonography Gynecology : Female Infertility Applications

李毅評主任

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According to the CDC, in the United States, about 7% of reproductive-aged women have infertility after one year of unprotected sexual intercourse. Infertility can result from factors affecting females, males, or both or unexplained infertility. In taiwan, infertility is also a very serious and common problem.

In order to detailed evaluate the uterus, fallopian tubes, and ovaries with a radiation free, inexpensive, readily available, non-invasive, relatively less time consuming and easily repeatable, the gynecologic ultrasonography remains the best tool for infertility workup. Besides, in several infertility treatments, monitoring the endometrium condition and growth of follicles also relied on ultrasonography.

This was a brief review of ultrasonography in female infertility. The infertility causes are multifactorial in origin with both congenital and acquired problems of the uterus, fallopian tubes and ovaries. The ultrasound also plays the most important role in the follicular and endometrial assessment in Intrauterine insemination (IUI) and Invitro fertilization (IVF) cycles for management of female infertility.

Since 2021/7/1, our government in Taiwan started to financially support the IVF treatment for each couple with 100,000 NT dollars. The utility of ultrasonography in female infertility will become more widely used in the future and all of us had to be equipped with this fundamental skill.

Clinical Applications of the Non-invasive Assessment of Myocardial Work by Pressure-strain Analysis

王俊力主任

Cardiovascular Division, Department of Internal Medicine, Chang Gung Memorial Hospital, Linkou Medical Center, Taoyuan, Taiwan

Pressure-volume loop analysis is a gold standard for evaluating cardiac contractility. However, pressure-volume loop analysis is an invasive and time-consuming method, preventing it from widely use in clinical practice. Most of the echocardiographic measures for assessing left ventricular (LV) systolic function, such as ejection fraction and global longitudinal strain, do not take dynamic LV pressure change during systole into account and hence fail to describe LV function as a hydraulic pump. Recently, LV pressure-strain analysis has been introduced as a new technique to assess myocardial work non-invasively based on two-dimensional speckle tracking strain analysis. This new technique displayed novel insights in comparison to invasive methods and has been validated in different cardiac pathologies. Non-invasive assessment of myocardial work may play a major role in diagnosis, guiding therapies, and predicting prognosis. However, its incremental value in comparison to traditional echocardiographic parameters remains uncertain. This review aims to provide an overview of current applications and potential use of non-invasive myocardial work assessment by pressure-strain analysis.

Application of AI-assisted Identification of HF Phenotypes

洪崇烈主任

馬偕紀念醫院遠距暨居家照護中心

Patients with heart failure (HF) are primarily classified as 2 major phenotypes: either HF reduced (HFrEF) manifesting impaired systolic function (in the context of reduced global ejection fraction, LVEF<40%) or preserved ejection fraction (HFpEF, LVEF>50%), which may present with signs of diastolic dysfunction and HF symptoms. EF as a percentage chamber-based measurement of the amount of blood pumped out of the heart during systole. By contrast, HFpEF cannot be determined alone clinically from the LVEF. The clinical judgement and diagnosis of HFpEF is not an easy task, as the diagnostic criteria need to follow the 2016 guidelines of the American College of Cardiologists and the American Heart Association, meanwhile also taking the diagnostic algorithm of the European Society of Cardiology from multiple diastolic properties and natriuretic peptide levels into account.

Herein, I presented the works relevant to an AI-based HFrEF and HFpEF algorithm capable of automatic recognition of abnormal mechanical features from a large scale HFrEF/HFpEF patient population with high diagnostic performance. The patients' full spectrum echocardiography images were extracted from the echocardiography files and randomly separated into the training, validation and internal testing dataset. The model was further validated with an external testing dataset with the high AUCs. We concluded that the clinical application of such prescreening program may be implemented in clinical setting, with novel perspectives in identifying multiple dimensions from structural abnormalities with prognostic values.

3D TEE in Interventional Echocardiography

余文鍾醫師

Taipei Veterans General Hospital and National Yang Ming Chia Tong University

Advances in technology make possible the adoption of catheter-based therapy in a wide spectrum of structural heart diseases. There are more and more requirements for accurate images assessment before, during and after catheter-based intervention for structure heart diseases. To fulfill these requirements, there are rapid progress in the cardiovascular vascular imaging including echocardiography, CT and MRI.

The most striking progress in the interventional echocardiography is 3D TEE. It has the advantage to depict cardiac structures in live. There is a great improvement in the resolution and frame-rate in recent years. 3D TEE could serve as a guiding tool in trans-septal puncture, deployment of left atrial appendage occluder, mitral valve edge-to-edge repair and closure of mitral paravalvular leak.

In this presentation, the recommend 3D TEE views for these procedure will be presented and our experience in the mitral valve edge-to-edge repair will be shared.

Clinical Applications of Contrast Echocardiography

秦志輝主任

國泰綜合醫院心血管中心一般心臟醫學科

超音波對比劑為一種可被生物分解材質外殼所包覆的微氣泡，微氣泡直徑為數個微米，其外層包覆殼層以穩定結構保護微氣泡，當今主流的微氣泡係以脂質為殼層其內包覆氟碳化合物，可被生物體分解且無毒性及不易引起免疫反應，生物相容性高，而包覆氟碳化合物則相較其他氣體來的穩定，且可延長微氣泡被分解的時間，達到延長影像對比增強的效果。因其直徑小於10微米，可以流經肺循環進入左心房及左心室，達到心臟顯影的目的。目前超音波對比劑在心臟領域的應用包括心室顯影、心臟結構異常鑑別診斷、增強都卜勒訊號及心肌顯影等。國泰綜合醫院引進超音波對比劑做為心臟超音波檢查的輔助工具，對於心臟超音波影像不佳的病人提供解決方法，經由超音波對比劑的使用，可以更正確評估心臟的功能及是否有局部心肌收縮不良。對於心臟腫瘤及心室血栓的鑑別診斷更是超音波對比劑的強項，同時在心肌梗塞後的病人評估是否有心室破裂、心室瘤及心室假瘤形成亦提供良好的參考，在執行壓力性超音波檢查時，也可以提高冠狀動脈疾病的檢測率。目前衛福部開放的適應症為對於心臟超音波成像不佳的成人患者，可使左心室腔顯影及改善左心室內膜邊緣輪廓辨識，此項檢查為自費項目，目前正積極申請健保給付。全世界對於超音波對比劑的共識而言，超音波對比劑是相當安全的劑型，發生過敏反應的比例約為萬分之一，並且超音波對比劑沒有腎毒性，在腎功能不好的病人也可以使用。

Echo in Transcatheter VSD Closure

陳俊安醫師

Department of Cardiology, National Taiwan University Children's Hospital

Advances in transcatheter interventional cardiac catheterization have enabled percutaneous treatment for a wide spectrum of congenital heart disease (CHD), including the most common type of CHD – ventricular septal defect (VSD). For pediatric cardiologists, transthoracic echocardiography (TTE) is the single most important imaging modality for the diagnosis and follow-up of patients with VSD. Moreover, for interventionists, TTE could further provide important information about patient selection and preprocedural planning when considering about device closure of various types of VSDs (perimembranous type, outlet type, and muscular trabecular type).

During the intervention, echocardiography, particularly the transesophageal echocardiography (TEE), helps to select appropriate device, to guide the procedure, to evaluate the effects of the intervention, and to detect the occurrence of complications. Take device closure of perimembranous type VSD for example. Because this type of VSD is quite close to the aortic valve and the tricuspid valve, care must be taken to avoid interference with the valve function during establishing the guidewire rail and deploying the device. Besides, the geometry of perimembranous type VSD would become bizarre and complex once the tricuspid leaflets formed an aneurysm around the defect. Angiography alone sometimes is insufficient to fully delineate the exact morphology. Therefore, detailed evaluation of the VSD and surrounding tissues by TEE would provide a clearer guide to the best landing zone for the device.

The catheter team of National Taiwan University Children's Hospital have established VSD closure program since 2011. More than 450 patients with VSD have been successfully treated with various devices, and follow-up outcomes are excellent. A multidisciplinary team approach and optimal imaging guidance are crucial to ensure successful outcomes. In this talk, I would like to share our experience in this interventional procedure, focusing on the role of echocardiography.

TEE during Cardiac Arrest: Case-sharing

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1. The roles of TEE in resuscitation
2. TEE versus TTE
3. TEE during Cardiac Arrest: Case-sharing
4. The CURE protocol

超音波於蛇咬傷的臨床應用

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蛇類咬傷是(亞)熱帶地區重要且特有的疾病。台灣民眾最常被咬傷的三種陸生蛇種，分屬兩科，蝮蛇科(龜殼花與青竹絲)以及眼鏡蛇科(中華眼鏡蛇)。共同臨床症狀為疼痛與持續腫脹。台灣抗蛇毒血清成功降低了蛇咬傷病人的死亡率，但臨床發現血清似乎無法立即改善進展性腫脹，手術介入時機一直是臨床決策困擾之處。蛇咬傷病人接受筋膜切開術的比例，在不同醫院不同年代不同蛇種，都有相當出入的比例，過往僅憑臨床症狀診斷腔室症候群的定律並不適用於蛇咬傷的病人。蛇毒造成的腫脹與外傷導致的腔室症候群機轉並不相同，因此使用客觀的檢查方法建立臨床診斷是蛇咬傷臨床處置的當務之急。本研究[1]藉由超音波探測皮下組織發炎反應(cobble stone sign)直觀腫脹位置[2]，處於筋膜上或是筋膜內，再藉由超音波監測組織發炎進展的範圍進而決定血清治療效果；另外輔助使用都卜勒超音波監測腫脹處的血管是否產生舒張期的反轉動脈波型(diastolic retrograde arterial flow (DRAF))間接了解該處的組織壓力是否可能達到腔室症候群的壓力[3]，以此推測病人產生腔室症候群。自 2017 年至今，以此模式治療的蛇咬傷病患共有 46 人，並無蛇咬傷病人產生腔室症候群而建議接受筋膜切開術，病患後續追蹤也無出現其他併發症。此方法有效協助臨床醫師判斷蛇咬傷病人是否產生急性腔室症候群。

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The Impact of Point-of-care Ultrasound for Patients with Acute Flank Pain

--Earlier point-of-care Ultrasound, Shorter Length of Stay in Patients with Acute Flank Pain

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The effects of early integration of point-of-care ultrasound (PoCUS) into patient care are uncertain. This study aims to investigate the effects of early PoCUS on patients with acute flank pain.

Adult non-traumatic patients with acute flank pain receiving PoCUS were enrolled. Expert physicians reviewed the medical records and made the “final diagnosis” for the cause of acute flank pain. The primary outcome was the relationship between the door to ultrasound (US) time and length of stay (LOS). The secondary outcomes included the sensitivity, specificity, positive predictive value (PPV), and negative predictive value (NPV) of the sonographic diagnosis, compared with the final diagnosis.

Eight hundred and eighty-eight patients were included in the analysis. Patients receiving early PoCUS (≤ 120 min) had a shorter LOS (128 vs. 217 min, $p < 0.0001$). Patients in the late POCUS group (> 120 min) had a trend to receive more CT scans. The disease distribution, sensitivity, specificity, PPV, and NPV were similar in patients receiving early or late PoCUS for target diagnoses. After adjusting for the confounders, early PoCUS (OR, 2.77, 95% Cis, 1.93–3.98) had a positive impact on shorter LOS. In addition, the effect of early PoCUS became more prominent (OR, 4.91, 95% Cis, 3.39–7.13) on LOS in less than 3 h.

Early integration of PoCUS is significantly related to shorter LOS in patients with acute flank pain without increasing morbidity and mortality. Our results suggested “PoCUS early” in these patients to possibly alleviate emergency department crowding.

Echocardiography in Patients with Acute Ischemic Stroke in Emergency Department 心臟超音波於急診缺血性中風病人之應用

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Background: Current evidence regarding utilization of transthoracic echocardiography in post-stroke evaluation is still limited. The study aims to investigate the impact of transthoracic echocardiography (TTE) on the recurrence of stroke and mortality after acute ischemic stroke (AIS) in emergency department.

Methods: Emergency patients diagnosed with AIS from January to December 2019 were included and followed up till December 2020. The outcome measurement included recurrent stroke and mortality rates between patients with and without TTE. Cumulative recurrence/mortality rates were calculated using the Kaplan–Meier method. Recurrence/mortality-free curves were compared using the log-rank test. Cox regression models were employed to identify parameters that significantly and independently predict recurrence/mortality. Hazard ratios (HRs) with 95% confidence intervals (CIs) were computed.

Results: Among 846 included patients, 414 received TTE. The mean follow-up period was 362.8 ± 236.1 days. Forty-eight (6%) patients experienced a recurrent ischemic stroke and 83 (10%) died during follow-up. No significant difference existed in the rates of recurrent stroke between patients receiving TTE or not (6% vs. 5%, $p=0.706$). Patients receiving TTE had a lower mortality rate, compared with those without TTE (7% vs. 13%, $p=0.003$). Stroke type with other causes in the TOAST classification (HR, 6.20, 95% CIs, 2.09-18.38), malignancy (HR, 4.32, 95% CIs, 1.76-10.60), and a higher NIHSS (HR, 1.11, 95% CIs, 1.05-1.16) were positively related with mortality. By contrast, patients with left ventricle ejection fraction $\geq 40\%$ (HR, 0.15, 95% CIs, 0.05-0.44) had a lower mortality rate.

Conclusion: TTE was not associated with future recurrence in patients with AIS. However, patients receiving TTE had a lower mortality rate, especially in those with LVEF $\geq 40\%$.

Comprehensive Residency-based Point-of-care Ultrasound Training Program Increases Ultrasound Utilization in the Emergency Department

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主要論述針對急診住院醫師訓練，集中式的重點式超音波(POCUS)教育課程，比較教育課程前後：一、急診住院醫師的學習成效；二、急診住院醫師使用重點式超音波次數的改變；三、急診住院醫師開立X光、電腦斷層數量的改變。