外科 Surgery

October 18, 2025 (Sat)
Room 301

主　　題：外科超音波之新進展
The New Frontier of Surgical Ultrasound

Moderator: 張金堅 King-Jen Chang 臺大醫院
陳炯年 Chiung-Nien Chen 臺大醫院
黃凱文 Kai-Wen Huang 臺大醫院

時間 Time	演講題目 Topic	演講者 Speaker
14:00-14:05	Opening Remarks	陳炯年 Chiung-Nien Chen 臺大醫院外科部
14:05-14:30 S-S01	The Advance and Application of Therapeutic Ultrasound on Musculoskeletal Diseases	侯君翰 Chun-Han Hou 臺大醫院骨科部
14:30-14:55 S-S02	Applying Ultrasound in Non-surgery Therapy for Thyroid Disorders	黃士銘 Shih-Ming Huang 彰濱秀傳醫院外科部
14:55-15:20 S-S03	Introduction to Histotripsy: A Novel Noninvasive Ultrasound Therapy	蕭智陽 Chih-Yang Hsiao 臺大醫院創傷部
15:20-15:40	Coffee break	
15:40-16:05 S-S04	Focused Ultrasound Treatments for Pancreas Cancer	蕭智陽 Chih-Yang Hsiao 臺大醫院創傷部
16:05-16:30 S-S05	腦瘤的聚焦超音波進展	周聖哲 Sheng-Che Chou 臺大醫院神經外科
16:30-16:55 S-S06	Ultrasound-Mediated Brain Drug Delivery: A Trial Snapshot	王奐之 Huan-Chih Wang 臺大醫院神經外科
16:55-17:00	Closing Remarks	陳炯年 Chiung-Nien Chen 臺大醫院外科

ePoster

S-P01	Remission of Fatty Liver after Gastric Bypass Surgery	陳榮堅 Jung-Chien Chen 敏盛綜合醫院

S-S01

The Advance and Application of Therapeutic Ultrasound on Musculoskeletal Diseases

Chun-Han Hou
Department of Orthopedic Surgery, National Taiwan University Hospital

Therapeutic ultrasound is widely used in the treatment of musculoskeletal disorders, with surveys indicating high utilization among physical therapists in Canada, the United States, and the United Kingdom. Its proposed thermal and mechanical effects are believed to enhance local metabolism, circulation, connective tissue extensibility, and tissue regeneration, potentially improving pain, swelling, and joint mobility. It has been used in wide variety of disorders, such as lateral epicondylitis, knee/ hip/ shoulder osteoarthritis, rheumatoid arthritis and various autoimmune -related arthritis, postpartum breast pain, soft tissue pain reduction, calcified tendonitis, orthopedic infection, and perineal trauma. Despite this widespread use, evidence from randomized controlled trials remains inconclusive, and the clinical effectiveness of ultrasound therapy continues to be debated. Outcomes of interest include treatment success, pain reduction, improvement of functional disability, and range of motion should be further addressed or studied in the future.

S-S02

Applying Ultrasound in Non-surgery Therapy for Thyroid Disorders

Shih-Ming Huang M.D
Show Chwan Memorial Hospital

The non-surgical treatment of thyroid disorders using ultrasound can be divided into two main categories:
1) Ultrasound only for guiding procedures, such as radiofrequency ablation (RFA), MWA, LA. 2) ultrasound for both imaging guide and the energy source generating thermal effects inducing tissue coagulation and ablation eg. HIFU.

Anatomically, the thyroid gland is closely related to trachea, esophagus, major vessels, recurrent nerve and the cervical sympathetic chain. The recurrent laryngeal nerve and the cervical sympathetic chain lie immediately posterior to the thyroid gland, closely adherent to its posterior capsule. On the thyroid surface there are often abundant and relatively large vessels, which frequently become the main source of bleeding during the needle-based approach.

HIFU generating thermal coagulative necrosis by focusing and absorbing acoustic energy is a truly non-invasive therapeutic approach without any skin lesion. Currently, the only HIFU device introduced for thyroid treatment in Taiwan is ECHO-PULSE. It performs best when the lesion lies 13–27 mm below the skin surface and has a size of about 2–4 cm lesions without excess fluid content or coarse calcifications. The thermal focus typically reaches 60–90 °C. Since nerve damage may occur at temperatures above ~55 °C, and permanent nerve injury can occur above 60 °C, meticulous planning is required to avoid thermal nerve injury particularly the recurrent laryngeal nerve and the cervical sympathetic chain. To avoid nerve injury, it is recommended to maintain a minimum safety distance of ≥ 5 mm away from the thyroid posterior capsule. Because maintaining patient immobility during sonication is crucial to prevent mis-focused energy, some degree of sedation and analgesia to minimize motion during treatment. Since the procedure alternates between heating and cooling phases, each treatment usually takes about one hour. At 12-month follow-up, the volume-reduction rate can be approximately 70 %. Some studies have also reported beneficial outcomes of HIFU in patients with Graves' disease.

S-S03

Introduction to Histotripsy: A Novel Noninvasive Ultrasound Therapy

Chih-Yang Hsiao
Department of Traumatology, National Taiwan University Hospital.

Histotripsy is an emerging noninvasive therapeutic ultrasound technology that mechanically disrupts targeted tissue using precisely controlled acoustic cavitation. Unlike traditional thermal-based ablation techniques, histotripsy achieves tissue destruction without relying on heat, thereby minimizing damage to surrounding structures. This presentation will provide an overview of the fundamental principles, technical developments, and current clinical applications of histotripsy. Key topics will include the mechanisms of action involving cavitation bubble dynamics, real-time ultrasound imaging guidance, and recent advances in transducer design and control algorithms. In addition, current preclinical and clinical studies—particularly in liver, kidney, and prostate tumors—will be discussed to highlight the safety, precision, and potential advantages of histotripsy over conventional thermal ablation. Finally, the talk will explore future directions and the expanding role of histotripsy in noninvasive oncologic and non-oncologic interventions.

S-S04

Focused Ultrasound Treatments for Pancreas Cancer

Kai-Wen Huang[1,2,3]
[1]Graduate Institute of Clinical Medicine, National Taiwan University, [2]Center for Functional Image and Interventional Therapy, National Taiwan University, [3]Department of Surgery, National Taiwan University Hospital

Focused ultrasound treatments are novel ablative technology that uses high-intensity focused ultrasound to create local destruction in cancer cells non-traumatically. During the recent 10 years, more and more Focused ultrasound treatments were performed, with a majority being pancreatic cancers.

Now, focused ultrasound treatments of locally advanced pancreatic adenocarcinoma have been used to palliate appropriate stage 3-4 pancreatic cancers and who have undergone appropriate induction therapy. Technique of focused ultrasound treatments are described with the emphasis on continuous image-guidance

This speech will discuss the evolution of focused ultrasound treatments as well as its safety and efficacy accepted now. It will also introduce the earliest clinical experience about focused ultrasound treatments on pancreatic cancer in Taiwan, and we believe focused ultrasound treatments is feasible for appropriate patients with locally advanced unresectable pancreatic cancer.

S-S05

S-S06

Ultrasound-Mediated Brain Drug Delivery: A Trial Snapshot

Huan-Chih Wang
Division of Neurosurgery, Department of Surgery, National Taiwan University Hospital, Taipei, Taiwan

Ultrasound-facilitated drug delivery across the blood–brain barrier (BBB) has emerged as a practical strategy to improve the effectiveness of systemic therapies for malignant brain tumors. Low-intensity focused ultrasound (FUS) with circulating microbubbles can transiently and reversibly open the BBB, permitting higher local drug exposure while preserving surrounding tissue. The NaviFUS® system is a neuronavigation-guided, frameless FUS platform that has demonstrated first-in-human feasibility and safety of BBB opening in patients with recurrent glioblastoma (rGBM), establishing the technical basis for therapeutic combinations. Building on this foundation, the current clinical program pairs BBB

opening with bevacizumab (Avastin®), a standard-of-care anti-angiogenic agent in rGBM, with the hypothesis that enhanced intratumoral delivery will translate into better disease control. This talk will briefly review the mechanism of FUS-mediated BBB modulation and the early clinical evidence that informed trial design, then introduce the pivotal, randomized, open-label, multicenter study now registered as NCT06496971. In this trial, eligible adults with rGBM are randomized 1:1 to bevacizumab alone versus bevacizumab plus microbubble-mediated FUS using the NaviFUS system. Evaluators of radiologic response are blinded, and treatments recur on a two-week cadence. For the combination arm, bevacizumab 10 mg/kg IV is followed by microbubbles (SonoVue® 0.1 mL/kg) and acoustic-emission-guided sonication to open the BBB; therapy may be repeated for up to 34 weeks or until progression or intolerance, with a target of up to 32 evaluable patients across multiple sites. The study is designed to assess efficacy and safety relative to standard care and to generate practical insights into patient selection, targeting, and workflow. This presentation will also discuss how image-guided, noninvasive BBB opening could be integrated with biologics and small-molecule regimens to broaden therapeutic options in neuro-oncology, and outline the key readouts expected to clarify efficacy and inform future combination strategies.

S-P01

Remission of Fatty Liver after Gastric Bypass Surgery

Jung Chien Chen, Pei Ying Tsai
Minimally Invasive Surgical Center, Min-Cheng General Hospital

Background:

Obesity is one of the leading preventable causes of death worldwide. Obesity increases the risk of fatty liver disease, a condition that happens due to excessive fat deposit in the liver. Fatty liver can develop into hepatic fibrosis, cirrhosis or liver cancer. For people affected by it, the 10-year survival rate was about 80%. Gastric bypass surgery is a surgical procedure used to manage obesity and obesity-related conditions.

Materials and Methods:

From 2022 Feb to 2023 Sep, there were 60 morbid obesity patients with fatty liver pre-operatively. The comparisons of pre-operative and post-operative abdominal sonography were made.

Results:

After 3-months post-operative follow-up, the fatty liver improved dramatically accompanied by decreasing BMI. The maintaining results were kept till 1 year follow-up and longer.

Conclusion:

Gastric bypass surgery is an efficient procedure for improving fatty liver and maintaining weight reduction. And abdominal sonography is a convenient tool for diagnosis of fatty liver.

Key words:

Obesity, Fatty liver, Gastric bypass, Abdominal sonography