腎臟泌尿科 Nephrology & Urology

October 19, 2025 (Sun)
Room 104

主　　題：腎臟超音波

Moderator: 郭錦輯 Chin-Chi Kuo 中國醫藥大學附設醫院
吳明修 Ming-Shiou Wu 臺大醫院

時間 Time	題目 Topic	演講者 Speaker
09:00-09:40 KU-S01	Artificial Intelligence for Predicting Interstitial Fibrosis and Tubular Atrophy Using Diagnostic Ultrasound Imaging and Biomarkers	林彥仲 Yen-Chung Lin 臺北醫學大學附設醫院
09:40-10:20 KU-S02	Update on the Application of Ultrasonography in Understanding Autosomal Dominant Polycystic Kidney Disease	李文欽 Wen-Chin Lee 廖上智 Shang-Chih Laio 高雄長庚醫院
10:20-10:40	Coffee Break	

主　　題：早期攝護腺癌的精準診斷與治療
Precision Diagnosis and Treatment of Early Prostate Cancer

內容簡述：攝護腺癌又名前列腺癌，在臺灣男性十大癌症發生率中高居第三名。由於早期沒有明顯症狀，早期診斷除了攝護腺癌（PSA ）與肛門指診外， 經直腸超音波扮演重要的角色， 革命性的高解析度 29mHZ micro Ultrasound 已經引進臺灣， 預計將帶來早期攝護腺癌診斷上的新進展， 搭配多參數核磁共振(mpMRI)與精確病理切片地圖， 引領早期攝護腺癌的局部治療（Focal Therapy)新時代！

Moderator: 黃昭淵 Chao-Yuan Huang 臺大醫院
黃書彬 Shu-Pin Huang 高醫附設醫院

10:40-11:20 KU-S03	Micro-ultrasound for Prostate Cancer: Clinical Applications and Future Perspectives	邱士庭 Tristan Shih-Ting Chiu 臺大醫院
11:20-12:00 KU-S04	Focal Therapy for Early Prostate Cancer：Current Status and What We Should Know?	謝博帆 Po-Fan Hsieh 中國醫藥大學附設醫院

ePoster

KU-P01	Successful Treatment of Simple Lobar Nephronia with Short Term Intravenous Antibiotics and Prolonged Oral Antibiotics in an Adult Female	王震宇 Jenn -Yeu Wang 臺北市立聯合醫院忠孝院區
KU-P02	An Infiltrative Renal Tumor Mimicking a Hypertrophied Column of Bertin: A Diagnostic Pitfall	林士鈞 Shih-Jiun Lin 嘉義長庚紀念醫院
KU-P03	An Anteriorly Located Midline Prostatic Cyst Causing Bladder Outlet Obstruction	楊國雲 Kwok-Wan Yeung 輔英科技大學附設醫院

KU-S01

Artificial Intelligence for Predicting Interstitial Fibrosis and Tubular Atrophy Using Diagnostic Ultrasound Imaging and Biomarkers

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Chronic kidney disease (CKD) is a major global health issue, typically requiring invasive renal biopsy to evaluate interstitial fibrosis and tubular atrophy (IFTA), which are critical for disease management. This study explored the use of machine learning (ML) models to predict IFTA by combining ultrasonography (US) images with patient biomarkers. Data from 632 CKD patients across three hospitals were retrospectively collected, pre-processed, and analyzed using a dual-path convolutional neural network for feature extraction. ML models including XGBoost, random forest, and logistic regression were developed and validated via five-fold cross-validation. The combination of US image features and biomarkers yielded the highest predictive performance, with logistic regression achieving an area under the receiver operating characteristic curve (AUROC) of 99% at the image level and 96% at the patient level. Models using only US image features or biomarkers also showed strong results, with AUROC values over 80%. These findings indicate that ML-based method, especially using biomarkers alone, can provide a non-invasive, accurate, and practical approach for early IFTA assessment in CKD, potentially reducing the need for invasive procedures.

KU-S02

Update on the Application of Ultrasonography in Understanding Autosomal Dominant Polycystic Kidney Disease

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Autosomal Dominant Polycystic Kidney Disease (ADPKD) is a prevalent hereditary renal disorder affecting approximately 1 in 1,000 individuals worldwide. Ultrasound has emerged as the primary imaging modality for the diagnosis and monitoring of ADPKD due to its non-invasive nature, cost-effectiveness, and absence of radiation exposure. Characteristic sonographic findings include bilateral renal cysts of varying sizes, which typically manifest between the ages of 30 and 40 and increase in number and size over time. Although ultrasound cannot distinguish between PKD1 and PKD2 genotypes, PKD1 mutations are generally associated with more severe disease progression, larger cortical cysts, and a higher risk of complications.

Age-specific diagnostic criteria have been established to facilitate accurate identification of ADPKD across different genetic backgrounds. Beyond diagnosis, ultrasound plays a critical role in monitoring disease progression and evaluating therapeutic responses, particularly in assessing the efficacy of pharmacological agents such as tolvaptan. Measurement of total kidney volume (TKV) via ultrasound is essential for predicting renal function decline and identifying patients at elevated risk for end-stage renal disease (ESRD).

While computed tomography (CT) and magnetic resonance imaging (MRI) offer superior resolution, ultrasound remains the preferred initial imaging technique due to its safety profile and accessibility. Recent advancements, including three-dimensional ultrasound and artificial intelligence-assisted segmentation tools, have

further enhanced the accuracy of cyst detection and volume measurement, with performance comparable to MRI.

In conclusion, ultrasound continues to be an indispensable tool in the clinical management of ADPKD, with ongoing innovations aimed at improving its diagnostic precision and prognostic utility.

KU-S03

Micro-ultrasound for Prostate Cancer: Clinical Applications and Future Perspectives

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Microultrasound (microUS) is a high-resolution, real-time modality that enables targeted prostate biopsy using the PRI-MUS scoring framework. The multicenter OPTIMUM randomized clinical trial established noninferiority of microUS-guided biopsy versus MRI/ conventional ultrasound fusion for detecting clinically significant prostate cancer in biopsy-naïve men, positioning microUS as a viable alternative when MRI access is limited or contraindicated. Beyond equivalence, microUS and MRI appear complementary: several studies report discordant lesions visible on only one modality, and in men with negative mpMRI but persistent clinical suspicion, microUS has identified additional cancers, including clinically significant disease. Clinically, microUS consolidates imaging and biopsy into a single visit, supports real-time targeting aligned to PRI-MUS categories, and can streamline confirmatory or event-triggered biopsies within active surveillance pathways. Looking forward, AI-assisted ultrasound analysis and risk-adapted "microUS-first" triage with selective MRI offer promising routes to improve efficiency and widen access without sacrificing diagnostic yield. The session will pair evidence with image pearls and a pragmatic adoption roadmap for everyday practice, emphasizing when to use microUS alone, when to combine with MRI, and how to build quality and training into the workflow.

KU-S04

Focal Therapy for Early Prostate Cancer：Current Status and What We Should Know?

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Focal therapy (FT) has emerged as a promising treatment modality for selected patients with early-stage, localized prostate cancer. Aiming to strike a balance between oncologic control and preservation of quality of life, FT targets the index tumor while sparing surrounding structures such as the neurovascular bundles, external sphincter, and urethra. Techniques such as high-intensity focused ultrasound (HIFU), cryotherapy, and irreversible electroporation are currently in clinical use, with increasing support from multiparametric MRI and fusion biopsy for accurate lesion localization.

Although FT offers lower rates of urinary incontinence and sexual dysfunction compared to radical prostatectomy or radiotherapy, questions remain regarding long-term oncologic outcomes, standardized patient selection criteria, and follow-up protocols. Moreover, as prostate cancer is often multifocal, precise imaging and risk stratification are critical to minimize under-treatment.

This presentation will review the current evidence on focal therapy, its indications, technologies, and reported outcomes. We will also discuss ongoing challenges, such as integrating genomic data and establishing optimal surveillance strategies. Understanding the current status and future direction of focal therapy is essential for clinicians aiming to provide individualized, organ-preserving treatment options for men with early prostate cancer.

KU-P01

Successful Treatment of Simple Lobar Nephronia with Short Term Intravenous Antibiotics and Prolonged Oral Antibiotics in an Adult Female

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Backgrounds:

Simple and complicated forms of acute lobar nephronia based on the findings of contrast enhanced computed tomography of abdomen differ in clinical manifestations, pathogenesis and pathology and treatments.

Materials and Methods:

We presented a female adult with simple lobar nephronia with uneventful outcome. Besides, review of literatures was done.

Results:

This 55-year-old female patient presented to emergency room with frequency, dysuria, intermittent chillness, fever up to 38.4 C and general malaise on 2024/04/23. Hydration and high dose intravenous ciprofloxacin were done. Fever subsided on the next day of admission. Urine culture yielded Klebsiella pneumoniae, then intravenous antibiotics was shifted to ceftriaxone. Renal ultrasound revealed left renal hypoechoic lesion sized about 1.0cm and bilateral hydronephrosis. Contrast enhanced computed tomography of abdomen revealed an 18 x 16 x 15 mm ill -defined hypodense nodular lesion at upper pole of left kidney and no evidence of obstructive hydronephrosis (Figure 1). Follow- up renal echo through prone position with longitudinal scan revealed enlarging diameter of left hypoechoic lesion upto 3.3 cm (Figure 2). The urological consultation recommended continuing the current antibiotic treatment, while also emphasizing the need to contact the urologist if worsening of patient's conditions. Her clinical conditions and laboratory data improved after 5- day course of the above intravenous antibiotics, then she asked for discharge. Subsequently, the results of two sets of blood culture tests were both negative. Oral 7- day course of cefixime 200 mg bid was given. Another 7- day course of second-generation cephalosporin was given at NTUH outpatient department. She was proved to recover from simple acute lobar nephronia by repeated renal ultrasound after the above 19- day course of intravenous and oral antibiotics.

Renal ultrasound findings of prescreen criteria for contrast-enhanced CT scan for the diagnosis of acute lobar nephronia consist of focal loss of corticomedullary differentiation, hyperechoic renal parenchyma, focal hypodense parenchyma, marked renal enlargement, or severe renal enlargement (i.e., kidney length greater than the mean plus 3 standard deviations). In simple acute lobar nephronia, the Hounsfield units of renal area are uniformly reduced under contrast enhanced computed tomography of abdomen; while in complex acute lobar nephronia, the Hounsfield units of the renal area are unevenly reduced, moreover the above areas may have low and extremely low Hounsfield units

Conclusion:

Repeated renal ultrasound for decision of further evaluation by contrast enhanced computed tomography of abdomen and as follow- up tests during treatment were highlighted.

KU-P02

An Infiltrative Renal Tumor Mimicking a Hypertrophied Column of Bertin: A Diagnostic Pitfall

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Background:

Infiltrative renal tumors often present as isoechoic lesions on ultrasonography. When located at the middle pole, they may mimic a benign hypertrophied column of Bertin (HCB), leading to diagnostic difficulty and potential misdiagnosis.

Case presentation:

An 82-year-old man presented with gross hematuria. Ultrasonography revealed an isoechoic lesion at the middle pole of the right kidney, suspected to be either an infiltrative renal tumor or an HCB. Further contrast-enhanced CT demonstrated an infiltrative renal mass, with direct invasion of liver and colon, along with regional lymphadenopathy and liver metastasis. Biopsy confirmed the diagnosis of urothelial carcinoma with metastasis.

Conclusion:

Middle pole infiltrative renal tumors may mimic a benign HCB on ultrasonography, which may result in misdiagnosis and delayed treatment. In patients with ultrasound findings suggestive of an HCB but who also present with high-risk features such as advanced age or hematuria, further cross-sectional imaging with CT or MRI is warranted to confirm or exclude the possibility of malignancy.

Key words:

Infiltrative renal tumor, Hypertrophied column of Bertin, Renal ultrasonography

KU-P03

An Anteriorly Located Midline Prostatic Cyst Causing Bladder Outlet Obstruction

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Background:

Prostatic cysts are rare, with a prevalence of nearly 1 %. These cysts are often discovered incidentally and asymptomatic in 95 % of cases. Symptomatic prostatic cysts can cause dysuria, urinary obstruction, pain, hematuria, hemospermia, or ejaculation disorders. Midline prostatic cysts are less common and are mostly located posteriorly. Midline prostatic cysts located on the anterior aspect of the bladder neck are exceedingly rare. We now present a case of anteriorly located midline prostatic cyst causing bladder outlet obstruction.

Materials and methods:

A 52-year-old male patient presented with micturition pain, difficulty in voiding, and interruption of urine stream for one week. Urinalysis showed elevated red blood cell count (20-29/ high power field).

Results:

Transrectal ultrasound showed a 1.5 cm, round and anechoic nodule located anteriorly in the midline location. Intravenous uropathy revealed a round filling defect in the inferior midline portion of the urinary bladder. Cystoscopy demonstrated a bulging nodule at the bladder neck on the 11 o'clock position, corresponding to the anterior wall of the bladder neck. Contrast-enhanced CT showed a 1.5 cm, round and cystic nodule at the anterosuperior aspect of the prostate protruding into the urinary bladder, and CT diagnosis of a prostatic cyst was made. Transurethral resection of prostate was performed by the urologist to remove the prostatic nodule, which was proved to be a prostatic cyst pathologically. The symptoms of the patient improved after surgery, and the patient was discharged on the 2nd postoperative day.

Conclusion:

Anteriorly located midline prostatic cysts are exceedingly rare and pose a diagnostic and therapeutic challenge due to difficulty of access and are associated with bladder outlet obstruction. Endoscopic management is recommended as the first choice for the symptomatic patients with a cyst near the urethra.

Key words:

Anteriorly midline prostatic cyst, Bladder outlet obstruction