W37: Pelvic floor ultrasound in assessment of complex voiding dysfunction and mesh complications

Workshop Chair: Lewis Chan, Australia

Start	End	Topic	Speakers
		Introduction and overview	Lewis Chan
		Techniques of pelvic floor imaging and how to optimize the ultrasound image	Lewis Chan Stephanie The
		Assessment of female urinary incontinence and sling complications	Lewis Chan Vincent Tse
		Imaging of pelvic organ prolapse	Vincent Tse Stephanie The
		Using 3D/4D ultrasound of pelvic floor in complex mesh complications (case discussion)	Lewis Chan Vincent Tse Stephanie The
		Assessment of the male pelvic floor and post prostatectomy incontinence	Lewis Chan Sean Mungovan
		How to choose ultrasound equipment for pelvic floor imaging and training/accreditation issues	All

Aims of Workshop

There is increasing interest in using ultrasound for assessment of complex voiding dysfunction, pelvic organ prolapse and sling/ mesh complications. This workshop aims to provide participants with the knowledge and skills to utilize ultrasound imaging in assessment of complex pelvic floor problems.

The workshop covers principles of pelvic floor imaging, sonographic anatomy, applications of ultrasound in evaluation of female and male urinary incontinence, slings/mesh complications such as obstruction/ erosion, and pelvic organ prolapse. Ultrasound modalities covered include transabdominal, transperineal and transvaginal scanning of the pelvic floor as well as 3D imaging techniques useful in the assessment of complex cases.

Learning Objectives

Acquire knowledge of the principles of ultrasound imaging of the pelvis and utilize ultrasound as the imaging modality in assessment of voiding dysfunction, pelvic organ prolapse, sling and mesh complications

Target Audience

Urology, Urogynaecology and Female & Functional Urology, Conservative Management

Advanced/Basic

Intermediate

Suggested Learning before Workshop Attendance

Pelvic floor ultrasound in the diagnosis of sling complications: Chan L, Tse V, World J Urol. 2018 May;36(5):753-759

Pelvic Floor Ultrasound – Principles, Applications and Case Studies. Chan L, Tse V, The S, Stewart P. Springer-Verlag London 2015 ISBN 978-3-319-04310-4

Faculty disclosure information

The presenters disclose that they have no relevant financial relationships to make relevant to this workshop.

Workshop Notes

Clinician performed ultrasound – why should we do this?

- Extension of physical exam/ answers specific clinical questions
- Provides valuable clinical information
- Streamline patient management
- Ultrasound equipment widely available and reducing in cost
- More efficient use of resources in the healthcare environment

Applications of ultrasound in voiding dysfunction/ female urology - Transabdominal and transperineal pelvic floor imaging can be used as non-invasive assessment modality for evaluation of voiding dysfunction, urinary incontinence in males and females and pelvic organ prolapse. Ultrasound can also be a useful imaging modality for urodynamics and pelvic floor physiotherapy. The scanning techniques can be easily learnt by clinicians, nurses and physiotherapists.

Ultrasound imaging of pelvic floor/ pelvic organs

- Transabdominal
- Transperineal/ translabial
- Intracavity (transvaginal/ transrectal)

Choice of equipment

- Imaging requirements (grayscale 2D/ Doppler/flow imaging/ procedures/3D capability)
- Type of transducers (General purpose curved probe eg 2-5MHz for abdominal/perineal imaging and high frequency eg 5-7.5Hz for intracavity imaging)
- Cart based vs portable/laptop units
- Durability/ number of users- medical/ nursing/allied health
- Procedures/ disinfection protocols
- Training/'knobology'- how easy is it to use?

Female pelvic floor imaging

Tips for transperineal imaging

- Use adequate gel to ensure good transducer coupling
- Start scan in sagittal plane
- Identify bladder, urethra, vagina and rectum
- Adjust depth of field and focus
- Movement of transducer by rocking to capture desired field of view (ie anterior/middle/posterior compartments)
- Ask patient to cough, Valsalva and contract their pelvic floor for dynamic assessment

Protocol and Tips for transperineal imaging of pelvic organ prolapse

- Lighting should be dim in the examination room
- Female chaperone should be present during the examination
- Imaging may be performed in the setting of urodynamic testing or in the office with at least 200ml of bladder volume
- Static images obtained first of the disposition of the pelvic viscera
- Dynamic images with the patient performing a Valsalva maneuver are obtained, noting bladder neck/urethra mobility, presence of urodynamic stress incontinence or occult stress incontinence after reduction of the prolapse, also note the most dependent point of the prolapse for POP-Q assessment
- Avoid excessive pressure on the introitus with the transducer during the examination as it may cause discomfort, and may obscure the severity of the prolapse
- Upper tract imaging (hydronephrosis/ calculi) especially in higher stage prolapse or in a patient with unexplained deterioration in renal function
- Assessment of pelvic floor contraction
- Postvoid residual measurement if done in conjunction with urodynamics

Imaging protocol for urodynamics in the female patient

- Transabdominal imaging of bladder at beginning of filling phase to confirm catheter position if necessary
- Bladder imaging at filling volume of 150mls
- Upper tract imaging (hydronephrosis/ calculi) especially in neurogenic bladder patients
- Repeat bladder imaging +/- upper tract imaging at or near capacity
- Dynamic translabial imaging (bladder neck/urethra/ POP) performed with patient standing after removal of filling catheter, at rest and on Valsalva/cough
- Bladder neck descent/mobility measured relative to inferior aspect of pubic symphysis in mid sagittal plane
- Assessment of pelvic floor contraction
- Postvoid residual measurement at end of urodynamics

3D ultrasound of pelvic floor

Technique of acquiring 3D volume datasets

- results of 3D data analysis depend on the quality of image data acquired
- high quality 2D image acquisition will allow good 3D data capture
- Use the same gain adjustments (TGC, LGC, Gain, ROI) settings to optimize image before performing 3D acquisition
- Keep patient relaxed and comfortable to minimize unintended pelvic floor activation especially in assessment of pelvic organ prolapse
- Use lots of gel and ensure good contact between perineum and transducer (but not excessive pressure to distort anatomy)
- Start in mid-sagittal plane

Applications of 3D pelvic imaging

- assessment of pelvic organ prolapse
- sling and mesh failures
- obstructive voiding and defecation
- complex perineal/ perianal sepsis

Ultrasound in assessment of voiding dysfunction in males

Imaging for pelvic floor physiotherapy

- Can be done via transabdominal or transperineal approaches
- Performed with some urine in bladder (eg about 150-200mls) but not overfilled
- Dynamic imaging to detect pelvic floor contraction/'lift'

Imaging protocol for urodynamics in the male patient

- Imaging of bladder at beginning of filling phase to confirm catheter position if necessary
- Bladder/ prostate imaging at filling volume of 150mls (anterior bladder wall thickness measured on mid sagittal plane and intravesical protrusion of prostate)
- Upper tract imaging (hydronephrosis/ calculi) especially in neurogenic bladder patients
- Repeat bladder imaging +/- upper tract imaging at or near capacity
- Postvoid residual measurement at end of urodynamics

Ultasound imaging in assessment of post-prostatectomy incontinence

- Transperineal imaging of bladder neck, external sphincter
- Assessment of pelvic floor contraction
- Imaging during filling(supine) and standing (to assess urethral mobility/ bladder neck position)
- Imaging of prosthesis - male slings (eg in failed sling cases), measurement of reservoir volume in patients with artificial urinary sphincter