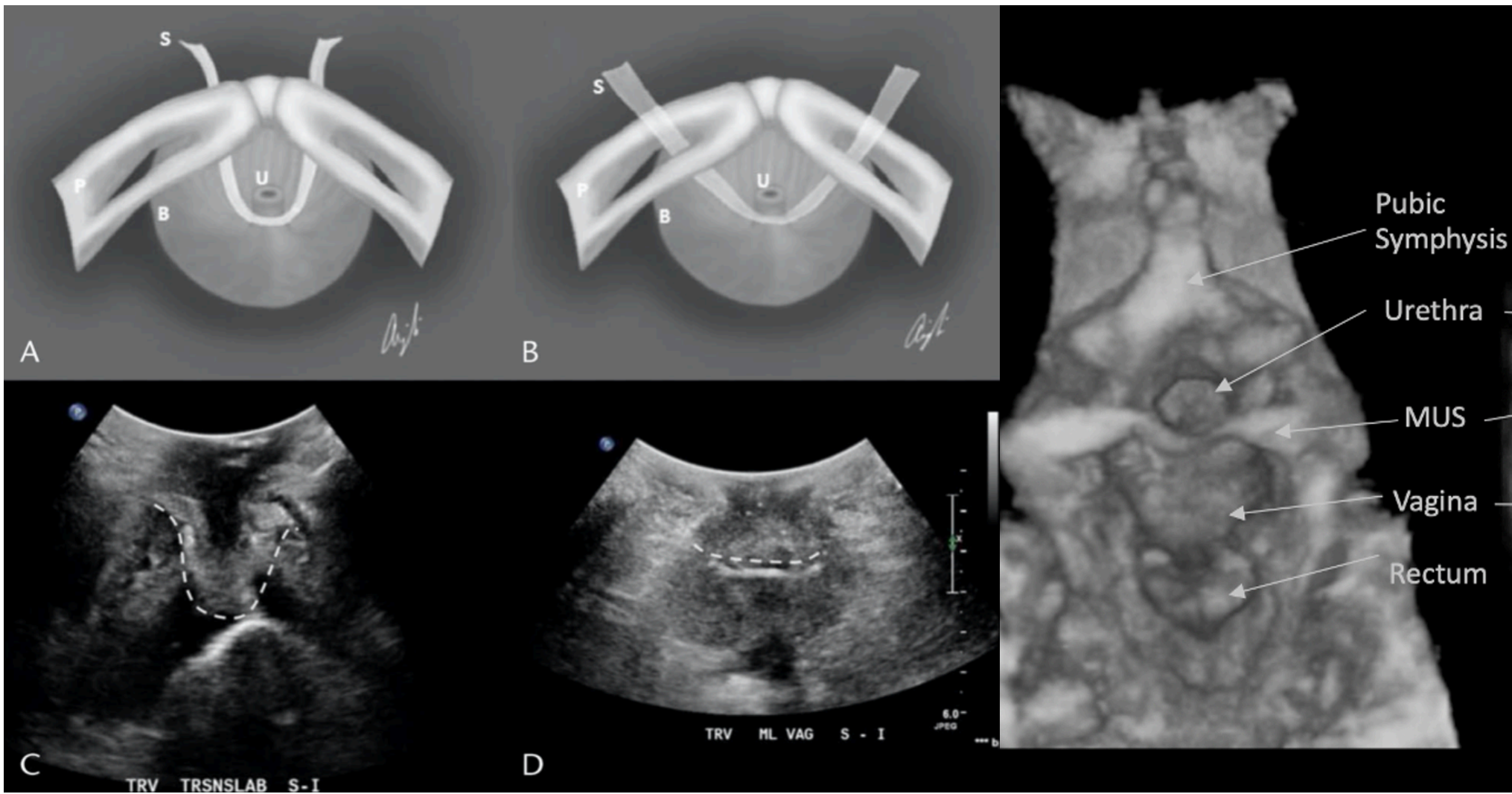


Translabial Ultrasound for Assessment of Synthetic Midurethral Sling Complications

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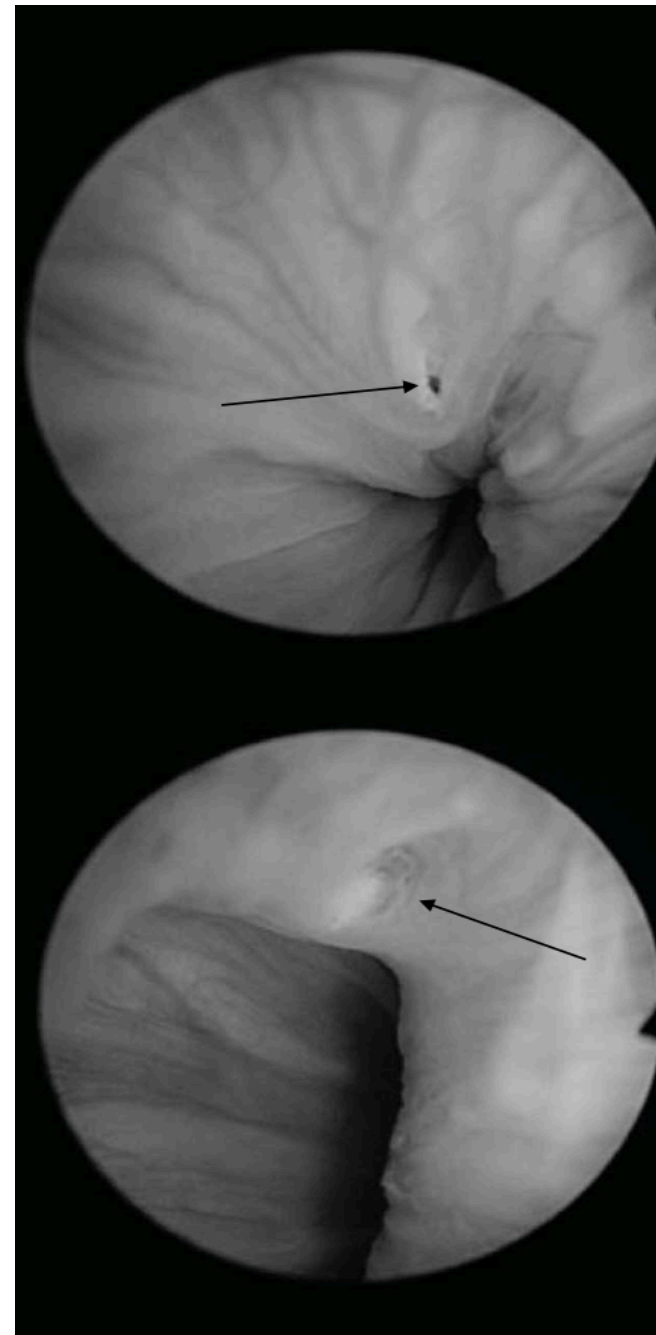
INTRODUCTION

- Synthetic midurethral slings (MUS) are placed around the posterior urethral wall for treatment of stress urinary incontinence (SUI).^{1,2}
 - MUS functionally reinforces urethral support by the pubourethral ligament and the suburethral vaginal hammock.
 - 2 main configurations: retropubic & transobturator
 - 5.9% 5-year risk of sling-related readmission and a 9.8% 5-year risk of sling-related complications.³
- Purpose / Question: how can we assess sling integrity in patients with MUS presenting with symptoms suspicious for sling complications?
- Translabial ultrasound (TLUS)
 - Ultrasound is an optimal imaging modality for evaluation of synthetic polypropylene MUS in the lower urinary tract as these are readily identified as echogenic foreign bodies.
 - A translabial approach is preferred because the insertion of a transvaginal ultrasound probe distorts the vesicourethral anatomy that is being imaged.⁴
 - Ultrasound offers the additional benefits of being cost-effective, well-tolerated, and non-irradiating.
- It is important for radiologists to recognize the different configurations of MUS and their associated complications on TLUS. The protocol described also allows for standardization in terminology and measurement techniques, presenting an opportunity for consistent and comparable reporting.



INDICATIONS FOR TLUS

- TLUS evaluation may be warranted in patients with a surgical history of MUS presenting with:
 - urethral mesh erosion
 - bladder mesh erosion
 - dyspareunia
 - urgency
 - obstructive voiding
 - dysuria
 - chronic pelvic pain
 - recurrent UTI's
 - visible vaginal mesh extrusion



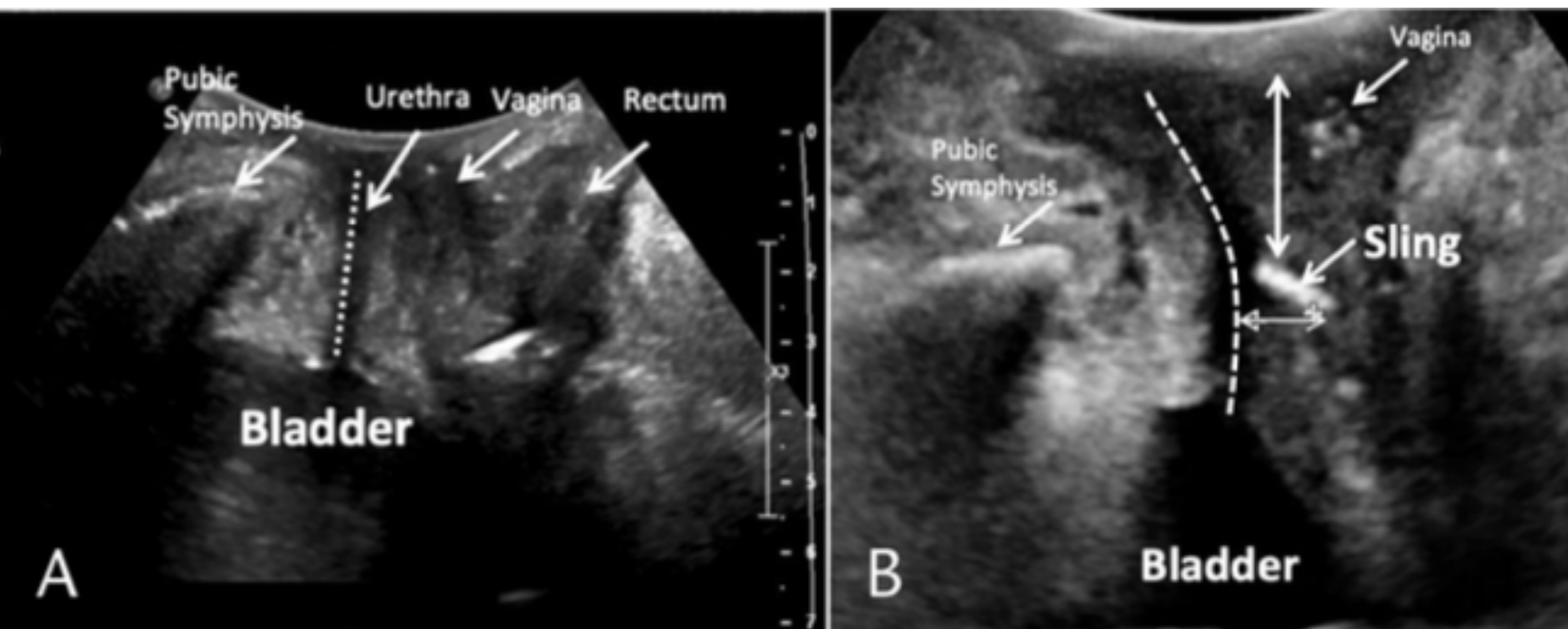
MATERIALS & METHODS

- Equipment: Our institution uses a Phillips, Epiq 7 ultrasound machine (Bothell, Washington, USA). Ultrasound examination is performed with a three-dimensional (3D) convex multifrequency transducer, typically in the range of 5.0-9.0MHz
- Patient Preparation: empty bladder prior to the exam or present with a partially full bladder, depending on imager preference. Patients are positioned supine with flexed knees and abducted hips. Mild elevation of the perineum via towels or a pillow may improve access for the TLUS. A continence pad can be placed beneath the patient in the event of urinary incontinence.

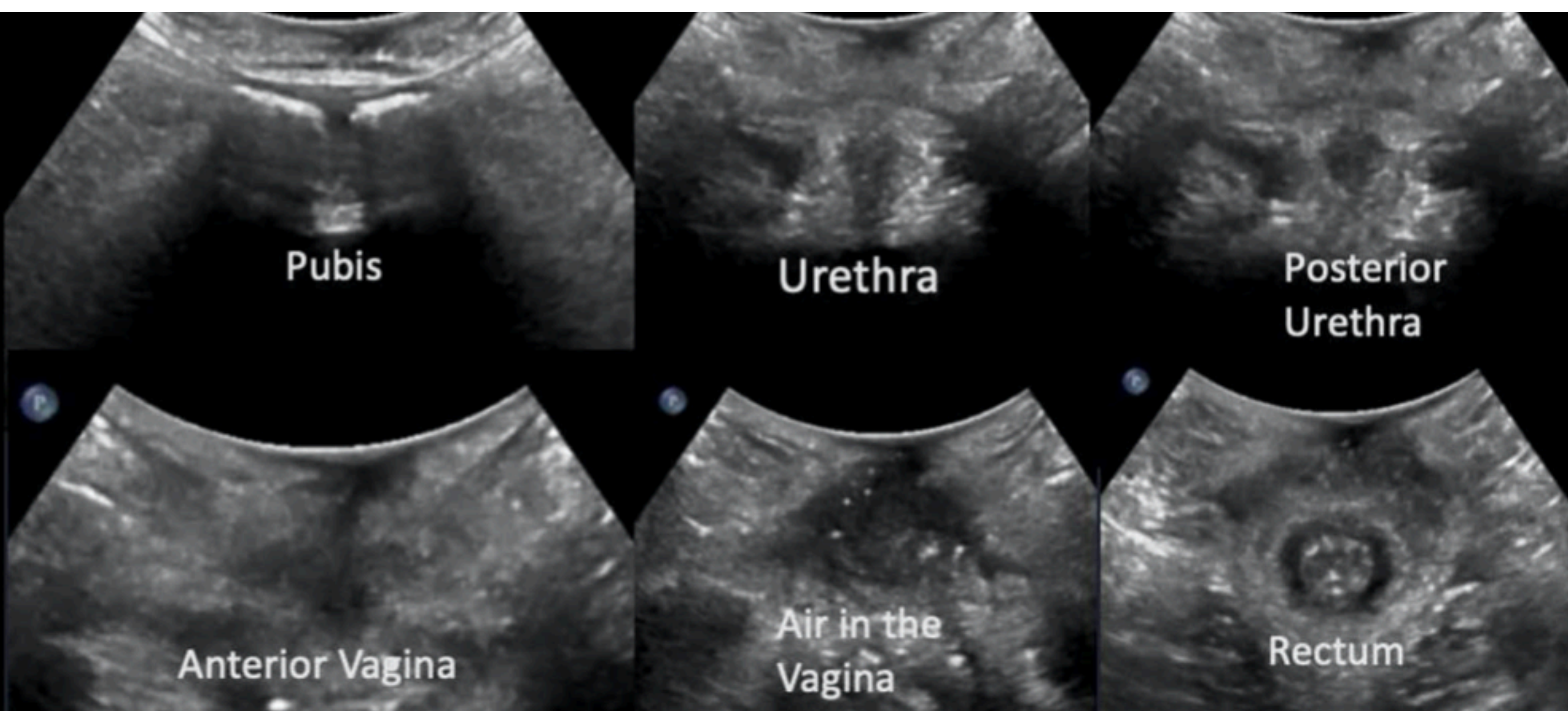
TABLE 1. Imaging Protocol for Assessment of Synthetic Midurethral Slings

Steps	At Rest	Comments
1	Sagittal Midline	Include landmarks of the pubis, urethra, bladder neck, vagina, and anorectal junction
	Sagittal Sweep	Cine-loop: capture from right to left to include obturator internus on both sides Static images in 1-2 cm increments equidistant
2	Dynamic Sagittal Midline	Perform Valsalva maneuver during cine-loop acquisition – Typically require several attempts to reach maximum sustained strain maneuver Ensure sling material remains within view
3	Coronal Sweep	Cine-loop: capture from anterior pubis to posterior rectum/anal junction Static images in 1-2 cm increments, equidistant
4	3D volume Acquisition	Include landmarks of the pubis, urethra and bladder neck, vagina, and anorectal junction – Settings generally maximum angle and quality. May decrease angle to increase detail – Place render box in plane of minimum dimension from pubis to anorectal junction – Confirm symmetrical alignment in planes (A, B, C or sagittal/coronal/axial) then obtain rendered view May use C plane (axial) to obtain slices at 1 cm increments through region of interest
5		Focused evaluation of MUS as needed

Sagittal Plane

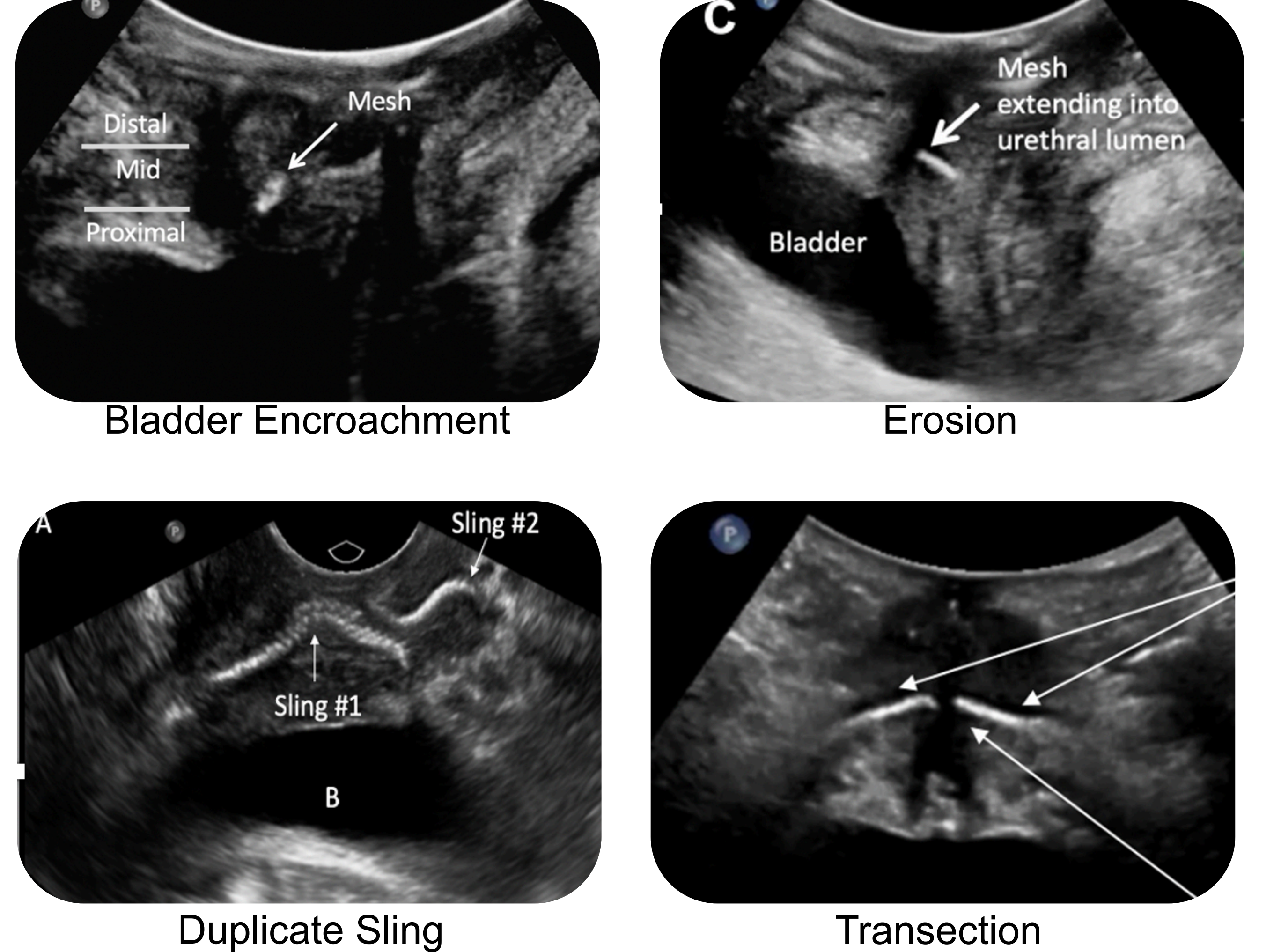


Coronal Sweep



MUS COMPLICATIONS VISUALIZED

- Possible complications of MUS include non-optimal placement of mesh, persistent urinary incontinence, obstructive voiding symptoms and in some cases recurrent urinary tract infections, erosion into surrounding tissues, bladder encroachment and redundancy of surgically implanted slings.



CONCLUSIONS

- TLUS provides an inexpensive, non-invasive method to directly visualize MUS with 2D, 3D and dynamic imaging. TLUS is increasingly being utilized by urologists and urogynecologists in the care of women who have undergone MUS procedure.
- Radiologists and sonographers should familiarize themselves with TLUS techniques, as TLUS can provide valuable information regarding the configuration, location, and certain complications of MUS.

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The authors of this poster have no disclosures or COI; correspondence can be directed to Daniela Escobar (Daniela.escobar@cuanschutz.edu).