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Original article

# Suprapubic mini-laparoscopy-assisted transurethral thulium laser excision of intravesical mesh after anti-incontinence sling procedures

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ABSTRACT

*Objectives:* We present our innovative technique of excising intravesically exposed mesh resulting from anti-incontinence sling procedures using transurethral thulium laser assisted by a suprapubic transvesical mini-laparoscopic grasper.

*Methods:* Two patients agreed to anti-incontinence sling surgery for stress urinary incontinence several years ago prior to presentation. Because of symptom recurrence, they underwent repeat anti-incontinence sling surgery. One patient developed dysuria and mild lower abdominal pain gradually 1 month after the operation. Cystoscopy was performed and revealed exposed mesh at the left anterolateral wall, which might have resulted from missed intraoperative bladder perforation. The other patient presented with dysuria 2 years following the second sling procedure. Cystoscopy demonstrated a calcified mass attached to the right lateral wall. Bladder erosion by a previously implanted mesh was thought to be the cause. Intravesical mesh was removed transurethrally with thulium laser assisted by a suprapubic transvesical mini-laparoscopic grasper for the former patient. Vesicolithotripsy was performed for the latter patient first and the intravesical mesh was removed in the same manner as in the former patient.

*Results:* The intravesical mesh was removed smoothly with thulium laser with the assistance of a suprapubic mini-laparoscopic grasper. As the procedure was minimally invasive, both patients recovered well after removal of the intravesical mesh. The irritative voiding symptoms also subsided following removal of the mesh.

*Conclusion:* Removal of eroded or misplaced intravesical mesh after anti-incontinence sling procedures can be accomplished by transurethral laser excision with the assistance of suprapubic transvesical mini-laparoscopic instruments. The procedure is safe, effective, and minimally invasive, with a fast recovery.


## 1. Introduction

There are several options for surgical treatment of stress urinary incontinence. The use of a synthetic mesh such as the tension-free vaginal tape has gained popularity because of the simplicity of the procedure. It is a minimally invasive procedure with a cure rate as high as 90%.[1] However, it is associated with certain risks, including bowel or major vessel injury, intraoperative bladder perforation, and chronic erosion of the mesh into the bladder. As for the intraoperative complications, bladder perforation is most frequent.[2] Some advocate the use of cystoscopy routinely during surgery and repositioning of the tape if bladder perforation is seen. However, the perforation can still be missed due to technical unfamiliarity with cystoscopy.[3] In addition, chronic mesh erosion can be a late complication of the procedure. The exposed intravesical mesh due to either missed intraoperative bladder perforation or bladder erosion may cause complications such as irritative voiding symptoms or bladder stone formation.

Removal of the exposed mesh from the bladder is mandatory for the management of tape-related intravesical complications. Several techniques have been reported, such as open exploration,[4,5] combined transurethral and transabdominal endoscopic procedures,[6]

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or laparoscopy-assisted procedures.[7] Recently, we managed two cases of tape-related intravesical complications after anti-incontinence sling surgery with a novel approach using transurethral thulium laser assisted with a suprapubic transvesical mini-laparoscopic grasper. We present specifically the technical points with a video demonstration.

## 2. Materials and methods

### 2.1. Case 1

A 46-year-old female complained of stress urinary incontinence on sneezing, coughing, and fast walking for many years. Operation with a tension-free vaginal tape secure system (Ethicon, Somerville, NJ, USA) was performed, and the symptoms resolved. However, the symptoms recurred 2 years later, and repeat anti-incontinence surgery was performed using an Align urethral support system (Bard, Covington, GA, USA). Dysuria and lower abdominal discomfort occurred following the operation. Cystoscopy revealed exposed mesh at the left anterolateral bladder wall (Fig. 1A). Missed intraoperative bladder perforation during the anti-incontinence surgery was thought to be the cause. Following informed consent, the patient was positioned in lithotomy, and cystoscopy was performed. A suprapubic transvesical 3 mm laparoscopic trocar was placed and a mini-laparoscopic grasper was inserted to grab the mesh for countertraction (Fig. 1B). A novel thulium laser (120 W, RevoLix; LISA Laser Products OHG, Katlenburg-Lindau, Germany) was then introduced via a bare-ended quartz fiber (440 μm core diameter) transurethrally for resection of the exposed mesh. With the assistance of a mini-laparoscopic grasper, the mesh could be resected deeply to part of the submucosa (Video). The mesh was removed transurethrally after resection (Fig. 1C). A urethral Foley catheter was left indwelling for 2 weeks. Her symptoms improved following the removal of the intravesical mesh.

Supplementary video related to this article can be found at http://dx.doi.org/10.1016/j.urols.2014.05.002.

### 2.2. Case 2

A 44-year-old female had undergone a Burch colposuspension for cystocele in 1999. However, the cystocele recurred 8 years later, and she underwent another anterior and posterior vaginal wall repair with concurrent anti-incontinence sling surgery. Refractory dysuria was experienced after the second operation. Pelvic examination revealed severe tenderness at the right anterior vaginal wall associated with urgency. Computed tomography showed a calcified lesion at the right urinary bladder wall (Fig. 2). On cystoscopy, an encrusted polypropylene mesh tape was seen on the right side of the bladder wall near the bladder neck (Fig. 3A). Chronic erosion of the mesh was thought to be the most likely cause. Vesicolithotripsy was performed first using a lithoclast, with subsequent exposure of the intravesical mesh. The mesh was removed in the same manner as described previously (Fig. 3B and 3C; Video).

**Fig. 2.** Vesical stone at the right lateral bladder wall, as revealed on computed tomography scan.

## 3. Results

In both cases, with the effective assistance of a suprapubic mini-laparoscopic grasper for countertraction, the intravesical mesh was removed with thulium laser. The Foley catheter was retained for 1 week after removal of the intravesical mesh. The patients were followed up regularly after the removal of the intravesical mesh. The irritative symptoms were significantly relieved. Cystoscopy

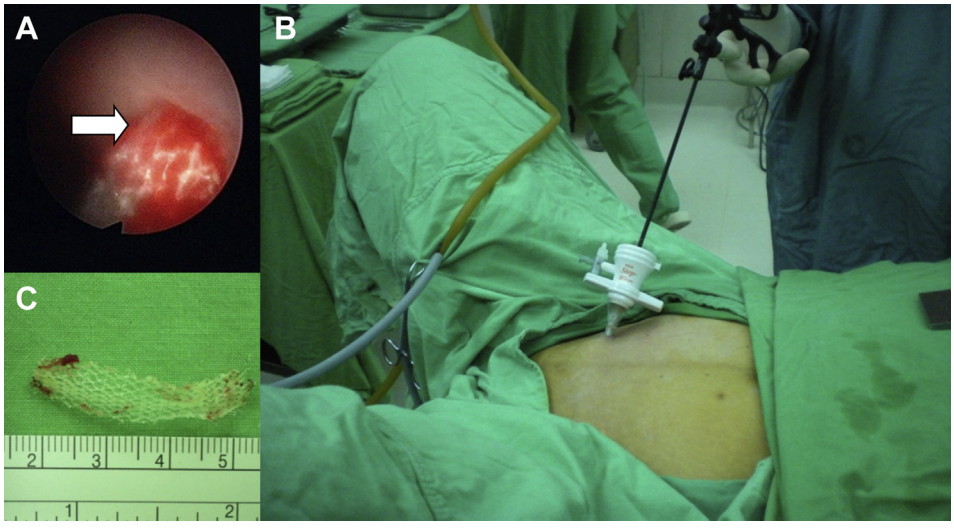


**Fig. 1.** Case 1. (A) Exposed mesh is seen at the left anterolateral bladder wall (arrow). (B) Insertion of a mini-laparoscopic grasper through a suprapubic transvesical 3 mm trocar for countertraction of the intravesical mesh. (C) Mesh segment that was removed from the patient.