



## Short communication

## Intravesical midurethral sling mesh erosion secondary to transvaginal mesh reconstructive surgery

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## ABSTRACT

**Objective:** We sought to evaluate the feasibility and the outcomes of correcting the intravesical mesh erosion after secondary mesh augmented pelvic reconstructive surgery pervaginally.**Methods:** We evaluated a case of mesh erosion following midurethral sling that occurred 4 years after secondary mesh surgery. Prior to second surgery, ultrasound and cystoscopy examination were performed to exclude mesh complication. Serial examinations during follow-up after the operation were uneventful until the patient presented 4 years after the second surgery with a history of dysuria and hematuria. Cystoscopy examination discovered intravesical mesh erosion 4 years after the secondary surgery. Removal of the midurethral sling mesh erosion and bladder repaired were done vaginally.**Results:** The patient was still symptom free and continent 1 year following tape excision. Urodynamic evaluation 6 months post-tape excision was also normal.**Conclusion:** Repeated vaginal reconstructive surgery may jeopardize a primary mesh or sling, and pose a high risk of mesh erosion, which may be delayed for several years. Removal of the mesh erosion and bladder repair are feasible pervaginally with good outcome.

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## Introduction

Since the introduction of midurethral sling in 1996, it is estimated approximately > 1 million procedures have been performed worldwide for the management of stress urinary incontinence (SUI). With the evolution of gynecologic surgery, minimally invasive therapy has become the mainstream of surgical treatment.<sup>1,2</sup> Based on the integral theory, continence can be achieved by placing a vaginal tape under the midurethra without tension to reinforce the weakened pubourethral ligament.<sup>3</sup> It has become one of the most popular procedures for female SUI because of its excellent results with a 5-year success rate of > 80%.<sup>4,5</sup> Eleven-year

follow-up with the tension-free vaginal tape procedure has shown high efficacy with 90% objective cure rates without any reported cases of mesh erosion.<sup>6</sup> Although the procedure is minimally invasive, associated complications can occur preoperatively (bladder perforation and vascular injury), early postoperative (infection and acute urinary retention), and late postoperative (bladder outlet obstruction, *de novo* detrusor overactivity, chronic pain, and mesh erosion).<sup>7</sup>

The overall reported incidence of mesh erosion is around 6%.<sup>8</sup> Early and delayed erosions and extrusions through the vaginal epithelium, urethra, bladder and skin have been reported.<sup>8</sup> Generally, 66% of mesh erosion is usually discovered within the first 3 months after surgery and, because delayed mesh erosion cases are rare, they can easily be overlooked.<sup>7</sup> Factors related to erosion include a prior history of pelvic surgery or pelvic radiation.<sup>8</sup>

With the advancement of modern medical care, the life expectancy of woman is also improved; therefore, it is not uncommon for patients to present again with pelvic floor dysfunction (pelvic organ

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prolapse) that may require reconstructive surgery many years after an incontinence surgery. Primary reconstructive prolapse surgery with anterior mesh reinforcement may cause negative impact on the pre-existing midurethral sling and may predispose to potential complication. We presented a case of a female patient with intravesical mesh erosion from a sling suspension that developed 4 years after primary prolapse surgery with mesh reinforcement, and its management.

## Report

A 66-year-old multipara, postmenopausal woman presented in 1996 with symptoms of SUI for first time. She underwent a trocar assisted sling suspension procedure after confirmation of urodynamic stress incontinence. She recovered well without any complication and her SUI was cured postoperatively. Subsequently, 8 years after first surgery she was referred back to our hospital when she presented with following symptoms: difficulty in emptying her bladder; a progressive bearing-down sensation, and a protruding vaginal mass. Initial assessment with pelvic examination revealed pelvic organ prolapse stage III, according to the International Continence Society grading system. Multichannel urodynamic tests were performed and the results showed an obstruction of the bladder outlet associated with the prolapse. Ultrasound examination showed a presence of suburethral echogenic vaginal tape, which was 1 cm distal to the bladder neck. After proper counseling was given, she agreed to surgical intervention. She underwent primary prolapse surgery: vaginal hysterectomy with mesh enforcement Perigee and Apogee mesh (American Medical Systems, Minnetonka, MN, USA). No bladder perforation or intravesical mesh erosion was noted during intraoperative cystoscopy. Regular follow-up examinations were scheduled at 6-month intervals. She claimed a marked improvement in her quality of life post operatively. At 1 year after the surgery, a 1-hour pad test (1.0G) and urodynamic test were performed and revealed neither urine leakage nor bladder outlet obstruction noted. An ultrasonographic examination also confirmed the presence of both suburethral sling and submucosa Perigee mesh *in situ*.

Subsequently, she presented again at 4 years after the surgery with complaints of urinary frequency, urgency, dysuria, hematuria, and suprapubic pain. Initially she was diagnosed and treated as recurrent urinary tract infection (UTI). An ultrasonographic examination showed a well-placed submucosa echogenic mesh beneath the bladder representing the Perigee mesh. The ultrasound examination also noted a J-shape echogenic tape piece with the tip penetrating the bladder at about 1 cm away from the bladder neck around the trigon area, which indicates the presence of intravesical mesh erosion. This finding was confirmed by cystoscopy examination (Figs. 1 and 2). After proper counseling and explanation, surgical intervention was offered where the entire protrusion of the mesh was removed surgically via the vaginal route. The bladder and vagina mucosa were identified and separated. The tissues were separated until a tension-free suture could be applied to close the bladder and vagina. Cystoscopy showed no remaining intravesical mesh filaments. The patient was counseled and the high risk of recurrence mesh erosion and recurrent SUI symptom explained. A repeated cystoscopy and ultrasonography done at regular follow-up showed normal findings, and she remained asymptomatic and able to maintain continence up to 4 years after tape removal and excision. A urodynamic examination was also normal after 6 months post excision.

## Discussion

Misrai et al<sup>9</sup> reported that the development of urgency and recurrent UTI after a sling procedure are nonspecific and may be

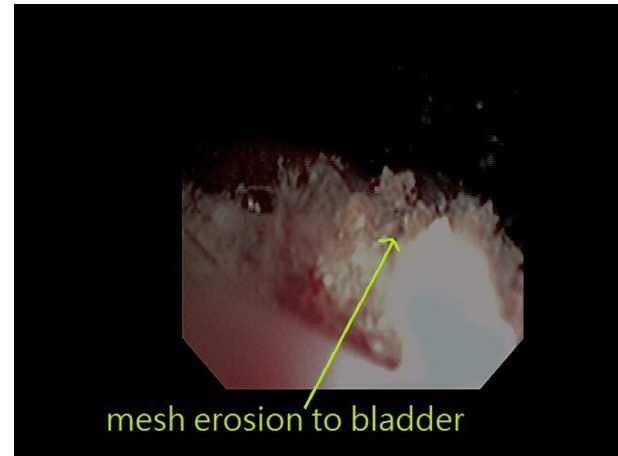


Fig. 1. Mesh extrusion in the bladder under cystoscopic examination.

confused with postoperative bladder outlet obstruction or *de novo* detrusor instability. A diagnosis of recurrent UTI that is not cured with usual antibiotic therapy may suggest the presence of a foreign body (intravesical tape). For those who had suburethral or vaginal mesh surgeries, a complete examination by cystoscopy is warranted, because it may indicate a serious underlying condition. Symptoms may vary, and includes severe urethral, pelvic, and genital pain, some patients have even undergone treatment with anticholinergic therapy without significant improvement.<sup>10</sup>

Bladder perforation is a known complication of midurethral sling procedures, occurring in approximately 10% of cases.<sup>11</sup> Lo et al<sup>6</sup> reported that intravesical mesh erosion could occur > 10 years after the primary procedure. Although the exact mechanism is unknown, proposed mechanisms for this complication include: placement of the mesh through the bladder at the time of surgery (undiagnosed during cystoscopy); placement of the mesh beneath the mucosa with subsequent erosion through the mucosa; or migration of the mesh under excessive tension with subsequent erosion into the bladder.<sup>12</sup>

A confirmatory diagnosis of bladder mesh erosion requires evidence of mesh extrusion into the bladder. Therefore, a cystoscopy examination is a standard procedure for the diagnosis of intravesical mesh erosion. Ultrasonography will help to provide real-

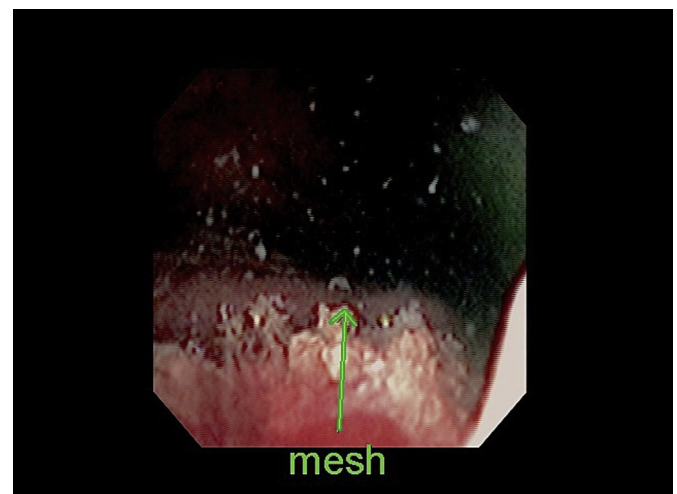


Fig. 2. Mesh extrusion at the trigon area under cystoscopic examination.

time images of the mesh in a suburethral, submucosal, or intravesical location. The serial images of the sling mesh from the ultrasound examination performed in this patient may suggest that the suburethral sling possibly moved and perforated the bladder mucosa. This possibility of the migration may be caused by tension on the sling with secondary erosion. It may also due to suburethral tissue scarring and ischemic change that occurs from the secondary surgery. Suburethral sling movement over time has been documented by Dietz et al.<sup>11</sup> and Lo et al.,<sup>3</sup> using ultrasonographic evaluation of the morphology of tensionless vaginal tape, and suprapubic arc procedure intravaginal slingplasty. Ultrasonography is a noninvasive and easily accessible tool. It also provides morphological information of the implants and is useful to study the relation of the slings or meshes in those who have had more than one mesh-augmented surgery.<sup>9</sup>

Cystoscopic examination during the second surgery confirmed that the bladder mucosa was intact and no intravesical mesh erosion was seen. During the removal of the extruded mesh and repair of the bladder, the excised mesh was confirmed to be a part of a suburethral sling. We believe the prolapse surgery could have jeopardized the preexisting midurethral slings and may have contributed to the increased risk of erosion and migration of midurethral slings.

No single standardized management and treatment for mesh erosion and extrusion exist. The mesh can be dissected free of the urethra and excised as superiorly as possible. Urethral defect repair by primary closure and periurethral fascia was developed as a second layer closure where possible. The vagina skin is then advanced and closed to avoid any overlap in the suture line. Open excision of the mesh and surrounding bladder followed by primary closure has been previously described.<sup>10</sup> In complicated bladder erosion with stone formation, bleeding, or recurrent infection, an open suprapubic approach with cystotomy is recommended to ensure access to the intravesical parts of the tape.<sup>7</sup> However, experience shows that only complete removal of the mesh that has traversed or is embedded in the bladder wall can alleviate the symptoms.<sup>10</sup> The surgical intervention option can be performed with partial or complete removal of the tape. About 52% of patients who underwent surgical resection had recurrence of incontinence in a 3-year follow-up study.<sup>12</sup> Cases of urethral diverticulum, partial cystectomy and urethrovaginal fistula following repair have being described.<sup>10</sup> Our patient was persistently asymptomatic in the first

4 years after surgery but long-term follow-up is recommended to evaluate the possibility of recurrences.

In conclusion, a repeated vaginal reconstructive surgery may predispose a high risk of mesh erosion in a primary mesh or sling. The occurrence of mesh erosion may be delayed and only appear several years postoperatively. Removal of the mesh erosion and bladder repair are feasible pervaginally and good outcomes can be expected. Long-term follow-up is advised after pelvic mesh surgery and ultrasonography is an effective screening tool and paramount examination in detecting intravesical mesh erosion.

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