



# Conservative management of intravesical erosion of a synthetic mid-urethral sling for the treatment of stress urinary incontinence, based on patient preference: A case report

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## ABSTRACT

**Background:** Intravesical mesh erosion is an uncommon late complication of placement of a synthetic mid-urethral sling (MUS) for the treatment of stress urinary incontinence, and only a few cases have been reported. Optimal management remains controversial, though there is a tendency toward surgical removal through a variety of routes. However, surgical removal comes with its own risks and is not necessarily associated with an improvement in symptoms. We, herein present the first case of a conservatively managed intravesical mesh erosion following MUS placement.

**Case:** Nine years after insertion of a tension-free vaginal tape (TVT), a patient presented with persistent lower abdominal pain and dysuria. Flexible cystoscopy demonstrated an erosion of the tape through the bladder wall. The patient declined surgical intervention at the time. Therefore, she was commenced on regular methenamine hippurate and vaginal oestrogen, and kept under surveillance with regular cystoscopies. Her symptoms responded to this treatment and 6 years later remained well controlled on this regime.

**Conclusion:** This case demonstrates that conservative management may be a safe and appropriate option for patients who decline surgical excision of mesh erosion.

## 1. Introduction

Following the introduction of the tension-free vaginal tape (TVT) by Ulmsten et al. in 1996 [1], the procedure grew in popularity over the next twenty years to become the treatment of choice for female stress urinary incontinence (SUI). Although only one of many types of mid-urethral sling (MUS) used to treat SUI, until recently it was widely accepted as the gold standard due to its minimally invasive technique, ease of use, and effectiveness, with short- and medium-term cure rates of 70–95% [2]. In addition, it was believed to be relatively safe, with serious complications being reported as rare, and more common events, such as bladder perforation, being easily identified and treated [3]. As such, it represented the ultimate 'high yield, low risk' operation.

However, since 2001, when mesh erosion was first described by Koelbl et al. [4], there has been an exponential increase in the number of reported cases of erosion into the vagina and lower urinary tract. This led to a "pause" in the use of surgical mesh for SUI surgery in the UK [5], and the commissioning of the Independent Medicines and Medical Safety Devices (IMMSD) Review, led by Baroness Cumberlege [6], in

2018. Mesh erosion is now recognised as a major complication of TVT surgery, and although the true burden of this complication is unknown, systematic reviews have estimated the incidence to be between 0.6 and 6% [7].

Optimal management of mesh erosion represents the next major challenge in urogynaecology. We present an unusual case of conservative management of intravesical mesh erosion, and demonstrate how, in carefully selected patients, a conservative approach can be beneficial.

## 2. Case Presentation

A 57-year-old woman was referred to a urogynaecology outpatient clinic in a tertiary referral hospital 9 years after having undergone insertion of a TVT in another healthcare facility. She was suffering from persistent lower abdominal pain and dysuria. This case report details her management over the next 6 years.

Following initial consultation, video urodynamic studies showed normal bladder function, and flexible cystoscopy demonstrated an erosion of the tape into the right lateral wall of the bladder (Fig. 1).

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Fig. 1. Right lateral bladder wall.

Otherwise, the bladder and urethra were entirely normal (Fig. 2).

She was offered surgical intervention at that time, but declined, so the decision was made, following multidisciplinary team (MDT) discussion, to keep her under surveillance by performing annual flexible cystoscopies. She was also commenced on methenamine hippurate, a urinary antiseptic, 1 g twice daily on a long-term basis to prevent stone formation and reduce the risk of recurrent urinary tract infections (UTIs).

Her symptoms responded to this treatment and remained well controlled, with repeat flexible cystoscopy unchanged, for three years. Unfortunately, nine months later she reported a two-month history of persistent UTIs and occasional left-sided vaginal pain. *Escherichia coli* was cultured from a mid-stream urine (MSU) specimen, and she had been given several courses of antibiotic treatment by her general practitioner. She was using oestradiol 10µg vaginal tablets on alternate days but had stopped taking methenamine hippurate. She was commenced on a two-week course of ciprofloxacin 500 mg twice daily in addition to restarting methenamine hippurate 1 g twice daily and continuing regular oestradiol vaginal tablets. Following MDT discussion, it was recommended that she proceed to a rigid cystoscopy and bladder biopsies to further investigate the sudden change in her symptoms. Four weeks later, she was once again asymptomatic and was keen to avoid general anaesthetic (required for the rigid cystoscopy procedure). She instead underwent repeat flexible cystoscopy, which showed the persistent area of mesh erosion with a small area of change, suggestive of follicular cystitis, surrounding it. There was no stone formation and the bladder otherwise appeared normal. No changes were made to her management.

At follow-up over the next two years, her symptoms remained well controlled whilst using regular methenamine hippurate and vaginal



Fig. 2. Bladder neck.

oestradiol tablets. During that time the patient expressed a desire to avoid further cystoscopies, as she associated them with the development of UTI symptoms.

Unfortunately, she reported another episode of UTI six months after her last review, associated with once again attempting to reduce her dose of methenamine hippurate. She also complained of mild dyspareunia. Vaginal examination was unremarkable. It was recommended that she trial Sylk© or Yes© lubricant during intercourse, increase methenamine hippurate to 1 g twice daily, and use vaginal oestradiol 10µg tablets on alternate days. Her symptoms resolved with this treatment regime, and she was encouraged to remain on this long term for symptom control.

### 3. Discussion

Intravesical and intraurethral mesh erosion is an unusual late complication of TVT surgery, with a recent systematic review finding that the median time until presentation after surgery is 34 months [8]. However, other case reports and case series have shown the interval between primary surgery and diagnosis to be anywhere between 1 and 13 years [9,10].

Clinical presentation varies and most commonly includes voiding lower urinary tract symptoms (LUTS), recurrent UTIs and haematuria, but can also include pain, urgency, frequency, SUI, urgency urinary incontinence (UUI), dysuria and dyspareunia [8,10]. These may be confused with postoperative bladder outlet obstruction or de novo detrusor overactivity [11]. This clinical presentation also significantly overlaps with that of genitourinary syndrome of the menopause (GSM). Given that 40–60% of postmenopausal women suffer with symptoms of GSM, conservative management with local vaginal oestrogen is appropriate [12]. However, the presence of a foreign body should be considered in patients with persistent LUTS that is resistant to pharmacotherapy, and they should proceed to careful clinical evaluation [13]. Failure to maintain a high index of suspicion, and to recognise the significance of these non-specific or recurrent symptoms, may result in a delay in the diagnosis of the underlying pathology.

Another plausible reason for the long interval between insertion and erosion is the mechanism by which erosion occurs. Although this is poorly understood, several theories have been proposed, which are secondary to 'host', iatrogenic or sling factors. Host factors include vaginal atrophy, local ischaemia, subclinical infection at the time of insertion and basic tissue incompatibility. Iatrogenic factors include occult intraoperative bladder or urethral perforation, subepithelial placement of the mesh with secondary pressure necrosis, or excessive tensioning of the sling, with subsequent 'cheese wiring' into the urethra [4,15]. Sling factors centre around the material used and its specific properties, i.e., pore size and weight [16].

Flexible cystoscopy is considered the investigation of choice for the diagnosis of mesh in a urethral, subepithelial or intravesical position. Ultrasonographic evaluation is a non-invasive, easily accessible tool which may assist in the diagnosis of urethral and bladder erosions [14].

Management of mesh erosion remains controversial because of a lack of substantial data and consensus regarding the best approach. Traditionally, an open surgical approach via a suprapubic, retropubic or transabdominal route has been used to achieve partial or complete excision of intravesical mesh [17], whereas intraurethral mesh removal has been undertaken transvaginally through open urethrotomy and urethral reconstruction [10]. More recently, several endoscopic transurethral techniques have been described. Standard transurethral resection (TUR) using a bipolar energy loop has reported success rates of 90% to 100%; however, there is an increased risk of bladder/urethral perforation and fistula formation with this approach [18]. An alternative to the bipolar energy loop is the transurethral application of holmium laser. This offers the advantage of greater precision when excising eroded material and minimal risk of perforation [10]. However, Jo et al. suggested that its success may be limited by the location of the mesh

erosion [18]. A laparoscopic transvesical/vesicoscopic approach for excision of intravesical mesh may be useful when the location of the erosion hinders transurethral techniques [19].

Unfortunately, surgical management of exposed mesh does not always result in resolution of troublesome symptoms and may even cause further complications. Dray et al. reported persistence of pain in 42.3% of patients undergoing revision surgery for pain related to mesh, and de novo pain in 6.3% of patients [20]. Similarly, Pace et al. found that only 33% of women reporting pain as their primary complaint experienced improved symptoms after mesh removal [21]. A recent systematic review found complication rates of 24–28% following endoscopic mesh excision, the majority of the complications being SUI [8]. Other studies have shown that approximately one-third of patients developed significant SUI within 1 year of mesh removal requiring further anti-incontinence surgery [22]. This can be devastating for patients, and equally as debilitating as the lower urinary tract symptoms caused by mesh erosion. Patients may therefore deem the risks of surgical intervention unacceptable. In addition, patients may simply prefer to avoid surgery (as in this case) or may be unsuitable for further surgery owing to medical comorbidities. For these reasons, there may be select cases where conservative management of mesh erosion could be considered not only appropriate but also safer.

Although management in this case was initially determined by patient preference, the symptoms responded to conservative treatment, and remained well controlled with sustained vaginal oestrogen replacement and a urinary antiseptic over six years. This highlights the potential safety of this approach in those willing to remain under long-term cystoscopic surveillance.

#### 4. Conclusion

To our knowledge, this is the only case report detailing a continued conservative approach in a case of mesh erosion into the urinary tract. Further studies are required to establish the overall safety of this approach in the long term, and comparative trials of expectant versus surgical treatment would be useful in determining this.

Given the widespread adoption of surgical mesh for the management of female stress incontinence, it is likely that the problem of mesh erosion and its subsequent management will become increasingly common. Once diagnosed, treatment of mesh erosion should be individualised and all treatment options and modalities explored. However, this case demonstrates that outpatient follow-up with regular interval cystoscopy may provide a safe alternative for those who wish to avoid surgical intervention.

#### Contributors

M O’Kane wrote the paper.  
G Araklitis was involved in initial patient care and edited the paper.  
A Rantell gained patient consent and edited the paper.  
D Robinson generated the idea and edited the paper.  
L Cardozo generated the idea and edited the paper.  
All authors saw and approved the final version.

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#### Conflict of interest statement

The authors declare that they have no conflict of interest regarding the publication of this case report.

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