

Late complication of bladder outlet obstruction following mid urethral sling with concurrent detrusor underactivity: A case report

Nurul Hikmah MN (Master of Obstetrics & Gynaecology), Zalina Nusee (Urogynaecology Fellowship)

Department of Obstetrics & Gynaecology, Kuliyyah of Medicine, International Islamic University Malaysia

SUMMARY

Late presentation of voiding dysfunction (VD) secondary to bladder outlet obstruction (BOO) following mid urethral sling (MUS) is seldom reported. A concurrent detrusor underactivity (DUA) could worsen the voiding dysfunction symptoms. We present a case of a 71-year-old woman presented with VD 12 years following MUS. Investigations showed evidence of partial BOO with concurrent DUA. Despite total mesh removal, the symptoms persisted requiring self-intermittent catheterization. Conclusion: This case highlights the importance of long term follow up of more than 10 years, as VD following MUS may still present late. Preoperative urodynamic evaluation of concurrent DUA is also crucial as it may further complicate outcomes.

INTRODUCTION

Mid urethral sling (MUS) is regarded as the gold standard treatment for stress urinary incontinence (SUI) as it is highly effective. However, despite its effectiveness, complications may arise such as mesh exposure, de novo urgency, and voiding dysfunction (VD). VD has been described in approximately 2-25% of women following MUS, and objectively confirmed obstruction may be identified in a substantial proportion of symptomatic patients.^{1,2} The presentation ranges from transient postoperative retention to chronic bladder outlet obstruction (BOO). The most common reported timing of occurrence is within two weeks, whilst late presentation is rarely reported.

Detrusor underactivity (DUA) is a urodynamic diagnosis that represents poor contractility of the bladder. Women may be asymptomatic or present with VD such as incomplete bladder emptying which may then lead to chronic urinary retention. This condition may co-exist in women presenting with SUI but often undiagnosed. We present a case of late presentation of BOO 12 years after MUS surgery with concurrent DUA, highlighting the importance of long term follow up and preoperative detection of DUA.

CASE PRESENTATION

A 71-year-old woman, para 3, presented to the urogynaecology clinic with VD and recurrent UTIs. She had undergone transobturator tape 12 years earlier. For the past four years, she complained of impaired bladder sensation, urinary frequency, incomplete voiding, and eventually

overflow incontinence. She then developed recurrent UTIs requiring hospital admission for intravenous therapy. Otherwise, she denied recurrence of stress incontinence. Examination findings were unremarkable. The post void residual is significantly high at 300ml.

Multiple investigations were conducted to assess the cause of VD and recurrent UTIs. Transperineal ultrasound showed the sling was positioned correctly at the mid urethra while the sling-pubis gap was 18.9 mm which did not suggest an overtight sling (Figure 1). Urodynamic study revealed that she had early first sensation at 69 ml, the bladder capacity was small at 132 ml, and a low compliance bladder (Figure 2). In the voiding phase, she had difficulty to void with Qmax of only 3 ml/s and PdetQmax of 28.6 cmH₂O. The Bladder Outlet Obstruction Index (BOOI) was 22 while the Bladder Contractility Index (BCI) was 53. The micturating cystourethrogram (MCUG) showed bladder distension with irregular wall and narrowing at mid-urethra, which was consistent with partial obstruction, otherwise there was no reflux or hydronephrosis reported. Cystoscopy was also performed and showed generalized trabeculated bladder with no evidence of mesh erosion on both the bladder and urethra. Our diagnostic dilemma was whether the chronic obstruction was contributed by BOO alone or by DUA as well. Even though the sling-pubis gap did not suggest an overtight sling, imaging with MCUG shown partial obstruction while the urodynamic study suggested equivocal obstruction and presence of DUA. In view of the severity of obstruction, we decided for total mesh removal, but preoperatively she was counselled the possibility of persistence of symptom post removal due to the presence of DUA. Post mesh removal, she reported return of voiding sensation however difficulty to initiate urination persisted requiring self-intermittent catheterisation. The frequency of UTI was also similar prior to mesh removal. We continue to monitor her condition to ensure no further complication arise such as upper tract infection or deterioration of renal function.

While the rates of VD after MUS have been reported at 2-25 %, urodynamic-confirmed BOO has been seen in up to 60% of symptomatic cohorts post sling surgery.^{1,2} The presentation of BOO is mostly reported early within the postoperative period with limited study reporting the exact time of occurrence. A long term study on outcome of MUS shown that majority of sling revision/removal occurred within the first few years after index sling surgery, with a cumulative risk of

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Corresponding Author: Nurul Hikmah MN

Email: nurulhikmah@iiu.edu.my

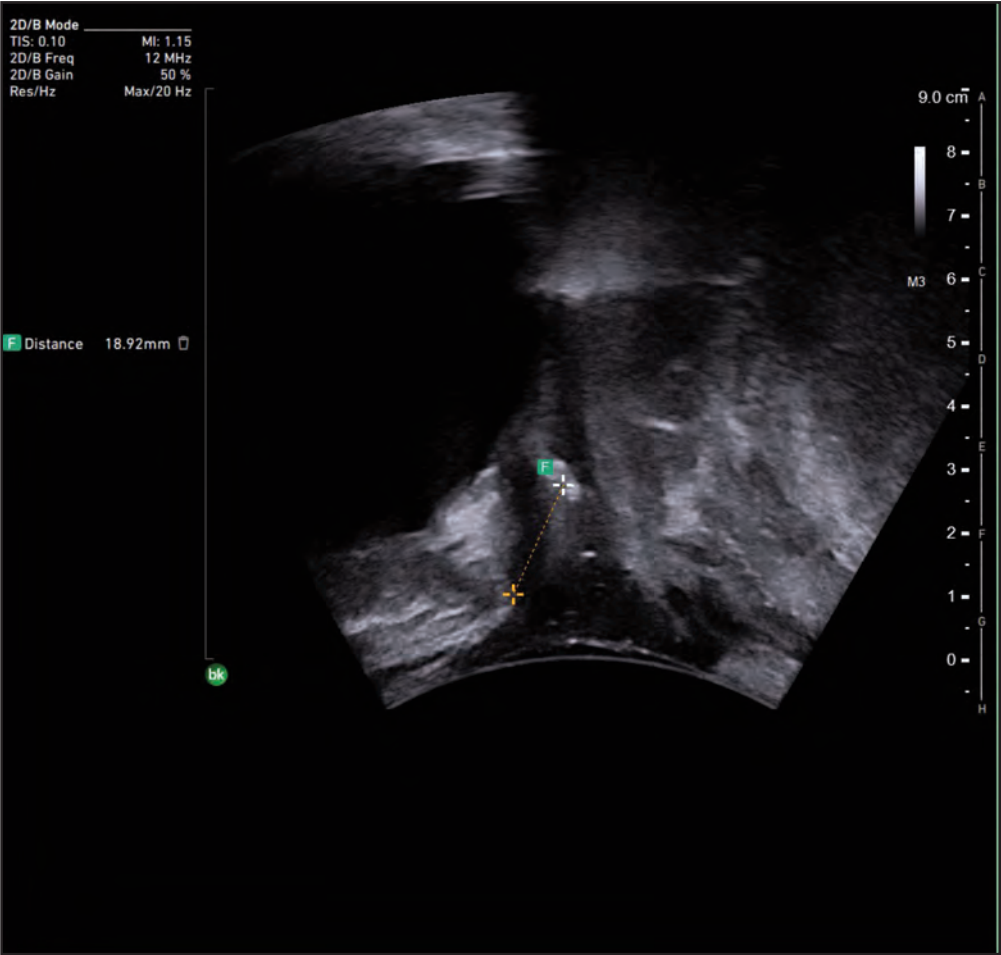


Fig. 1: Transperineal ultrasound showing sling-pubis gap

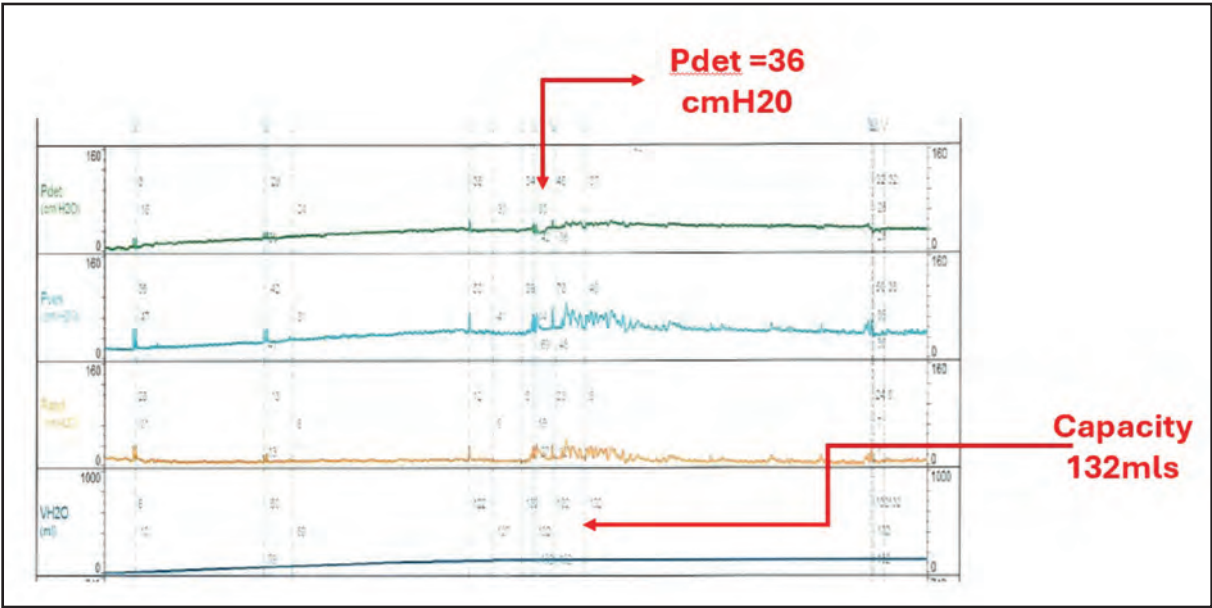


Fig. 2: Urodynamic study result showing low bladder compliance

0.9% (95% CI 0.9,1.0) at 1 year, increased to 1.3% (95% CI 1.2,1.4) at 6 years then remains plateauing until 9 years.³ This proves that BOO can also present late, and in our case even after 10 years. However, to date there is no standardized guideline suggesting the exact duration of mandatory follow up after MUS to allow early detection of VD. This case demonstrated that late detection of VD has led to low compliance bladder with potential irreversible bladder damage. A long-term follow-up for MUS is therefore mandatory as VD can still present late with possibility of needing lifelong monitoring. Follow-up visit should address specific question of obstructive symptoms such as incomplete emptying, frequency, weak stream, straining, and hesitancy. Post-void residual, uroflowmetry and transperineal ultrasound are useful adjunct for assessing sling position and potential obstruction.

VD after MUS may result from BOO due to an overtight sling, or from an underlying DUA. Differentiating between the two entities is often difficult, particularly when symptoms develop insidiously. DUA is increasingly recognised among women with SUI undergoing preoperative evaluation for MUS with one study reported 54.6% of women have concurrent DUA and SUI.⁴ In this case, we were unable to acquire the preoperative urodynamic study result to evaluate presence of concurrent DUA prior to surgery. The temporal association between sling surgery and new symptoms is important, however, in this case, the symptom only arose more than 10 years after the surgery, suggesting that it may not be caused directly by the sling alone but also contributed by other causes such as DUA. The current urodynamic result suggested both element of BOO and DUA given the equivocal BOOI and very low BCI, hence the decision to proceed with total mesh removal.

Several mechanisms may underlie obstructed voiding after MUS. The most frequently proposed is mechanical: excessive tape tension, urethral over-elevation, or mid-urethral kinking increases outlet resistance and compresses the urethra.⁵ Progressive peri-tape fibrosis and scar contracture may further tether or narrow the urethra over time, offering a plausible explanation for obstruction that presents years after an initially uncomplicated recovery, as in our patient. A neurogenic contribution from peri-urethral denervation during dissection has also been postulated, although evidence in minimally invasive MUS is limited and mechanical factors are generally regarded as dominant. Importantly, sustained partial obstruction can itself drive detrusor decompensation, whereby chronic outlet resistance leads to detrusor hypertrophy followed by fibrosis, reduced compliance, and ultimately impaired contractility.⁶⁻⁷ This continuum may account for the coexisting low-compliance, underactive bladder observed in our case and underscores why obstruction and DUA become difficult to disentangle once the disease is established.⁸

Urodynamic study is not a routine preoperative assessment for women planned for MUS, especially among the uncomplicated SUI. This case suggests that urodynamic study is crucial for all women undergoing MUS as this will allow objective assessment of the detrusor contractility. One mid-term outcome study of DUA at two years suggested the

impact is mainly at early post operative retention with no significant lasting effect.⁹ Therefore, a proper preoperative counselling is essential and compliance to follow up schedule should be emphasized to allow earlier detection and treatment of VD which could be contributed by both MUS placement and DUA.

CONCLUSION

This case highlights the importance of long term follow up for MUS of more than 10 years, potentially needing lifelong surveillance as VD may still present late. Evaluation of concurrent DUA by routine preoperative urodynamic study is also crucial prior to MUS as it may contribute to worsening of the VD and further complicate outcomes if remain undetected.

Ethical considerations & Patient Consent

This case report was prepared in accordance with the Declaration of Helsinki. Approval for publication of anonymised case material was obtained from the institutional research committee of SASMEC @ IIUM. The authors certify that they have obtained all appropriate patient consent forms, in which the patient had given her consent for images and other clinical information to be reported in the journal. She understands that her name and initial will not be published, and due efforts will be made to conceal the identity, but anonymity cannot be guaranteed.

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