Case Report

Late erosion of an Adjustable Transobturator Male System (ATOMS®) device

Jessica A Paynter,[1,2] Kirby R Qin,[1,2] Justin Chee,[3] Todd Manning[1] and Janelle Brennan[1,2]

[1]Department of Urology, Bendigo Health, [2]School of Rural Health, Monash University, Bendigo, and [3]Department of Urology, Alfred Health, Melbourne, Victoria, Australia

Abbreviations & Acronyms
ATOMS = Adjustable Transobturator Male System
AUS = artificial urinary sphincter
PPI = post-prostatectomy incontinence
PSA = prostate-specific antigen
RRP = radical retropubic prostatectomy

Correspondence: Jessica A Paynter MBBS (Hons), BMedSc, MTrauma, MSurg, School of Rural Health – Bendigo, Department of Surgery, Monash University, Building 20/26 Mercy Street, Bendigo, VIC 3550, Australia. Email: Jess.paynter@monash.edu

How to cite this article: Paynter JA, Qin KR, Chee J *et al*. Late erosion of an Adjustable Transobturator Male System (ATOMS®) device. *IJU Case Rep*. 2025; 8: 44–46.

Received 17 August 2024; accepted 14 October 2024. Online publication 27 October 2024

Introduction: This report describes late erosion of an Adjustable Transobturator Male System device which was inserted for post-prostatectomy incontinence. The Adjustable Transobturator Male System device eroded the bulbar urethra 5 years post insertion, despite initial improvement of symptoms.

Case presentation: Following an open radical retropubic prostatectomy, a 64 year-old male patient developed post-prostatectomy incontinence. He had a known urethral stricture and had also undergone salvage radiotherapy for biochemical recurrence of prostate cancer. His incontinence was initially successfully treated with an Adjustable Transobturator Male System device, yet this eroded his bulbar urethra 5 years post insertion, which was deemed to be a late erosion.

Conclusion: Urologists should be aware that late erosion of the Adjustable Transobturator Male System device can occur, and risk stratification of patients undergoing Adjustable Transobturator Male System device insertion may help to minimize erosion rates.

Key words: Adjustable Transobturator Male System, ATOMS, late erosion, post-prostatectomy incontinence.

Keynote message

This report describes a case of late erosion of an ATOMS device for PPI. The ATOMS device offers improvement in post-prostatectomy incontinence, but patient factors of previous radiotherapy and urethral strictures may increase the risk of urethral erosion, which can occur 5 years post insertion, as in this case report.

Introduction

The ATOMS® (Agency for Medical Innovations GmbH, Feldkirch, Austria) is a device used to treat male urinary incontinence following radical prostatectomy, commonly referred to as PPI. While AUS devices have traditionally been the gold standard, patient preferences for adjustability, durability, and passive voiding ability have led to increased use of the ATOMS device since its introduction in 2008.[1] ATOMS is inserted under general or regional anesthesia and compresses the bulbar urethra via an adjustable silicone cushion. The device is secured by four-point fixation to the pubic ramus and can be adjusted postoperatively under local anesthesia. Adjustability is a major benefit as there is a narrow balance between insufficient urethral compression resulting in persistent incontinence and excessive compression leading to urinary retention or device erosion.[2] Urethral erosion after ATOMS insertion has been reported at a rate of 0%–8.7% and is more common after prior radiotherapy or repair of urethral stricture.[2–5] Traditionally, ATOMS is regarded as a better choice after prostatic radiation than AUS as it has a lower rate of urethral erosion.[6] The natural history and time frame for urethral erosion post ATOMS insertion remains unknown.

Case presentation

We report the case of a 75-year-old male who presented with late urethral erosion of an ATOMS device.

Aged 64, an active Australian farmer underwent open RRP and bilateral pelvic lymph node dissection for prostate adenocarcinoma (pT2cN0M0, ISUP Grade Group 3 [Gleason 4 + 3], negative margins). He underwent salvage radiation (70 Gy in 35 fractions to the prostate bed) due to PSA recurrence 18 months post RRP. He subsequently developed a bulbar urethral stricture 2 years following the radiotherapy in addition to preexisting PPI. He had a 24-h pad weight of up to 300 g with light activity. The stricture was successfully treated with urethral dilatation and optical urethrotomy.

Five years after prostatectomy (age 69), the patient received a third generation ATOMS device for persistent PPI. An AUS was considered but given the patient's history of radiation and stricture, it was elected to place an ATOMS device as he had a high risk of needing further urethral instrumentation. The patient received a top up of the silicone cushion 1-month after implantation with excellent continence.

Five years after ATOMS insertion (age 75), he developed recurrent PPI and at this point received a second top up of the silicone cushion. The patient had initially good symptomatic relief for 2 weeks, but then developed dysuria and perineal pain. Flexible cystoscopy was performed which revealed an erosion of the ATOMS device cushion through the bulbar urethra (Fig. 1). Urine culture confirmed the absence of infection. The patient underwent emergent rigid cystoscopy, open explantation of ATOMS and bulbar urethral repair. The remainder of the urethra and bladder was normal.

Due to the history of urethral erosion in the setting of previous urethral strictures, he was referred to a specialist reconstructive urologist for insertion of an artificial urinary sphincter (AUS) with a bulbar urethral cuff, but unfortunately the cuff subsequently eroded at 6 months. The entire AUS was removed, and the patient received a suprapubic catheter. His PSA remains undetectable.

Discussion

The incidence of PPI varies from 1% to 40% and has a meaningful impact upon quality of life.[7] The AUS, introduced in 1973, is the gold standard treatment for PPI but is associated with drawbacks including recurrence of incontinence due to urethral atrophy and a mechanical pump requiring dexterity. These factors resulted in the development of male slings.[8] The ATOMS' device non-circumferential design theoretically reduced the risk of atrophy and erosion (compared to the AUS), as the ATOMS device does not apply circumferential compression on the urethra, and the bulbospongiosus muscle is not opened.[1,9] Risk factors associated with ATOMS device explantation (for any reason, not just erosion) include radiotherapy, severity of PPI symptoms prior to insertion and urethral stricture disease.[3,10] While ATOMS devices can be safely implanted in patients with prior radiotherapy, radiotherapy is an independent predictive factor for increased rates of early and overall explantation.[3,10,11] The case in question showcases a late erosion (5 years post implantation) in the setting of both radiotherapy and previously treated urethral strictures. Risk factors for ATOMS device urethral erosion have not been extensively documented, compared to risk factors for AUS urethral erosion (radiotherapy, prior urethroplasty, infection, small cuff size, androgen deprivation therapy, and high grade prostate cancer or prior AUS) which are well known.[12–14] Previous radiation therapy increases the risk of urethral stricture disease, which can increase the complexity of AUS insertion. AUS implantation is still, however, considered safe in irradiated patients, with patients able to achieve continence rates similar to nonirradiated patients.[15] AUS erosion typically occurs within the first 2 years of implantation.[14,16]

Long-term durability of ATOMS has been demonstrated as high as 80.4% at 8 years after implantation, although these results need to be tempered by the ongoing modification to the ATOMS device over the years.[10] The first generation was introduced in 2008 had a titanium inguinal port that required two incisions for placement. This was modified in 2013 when a scrotal port was introduced, and a third-generation device introduced in 2014 with a pre-attached silicone covered scrotal point. Given it is now a decade since the introduction of the third generation ATOMS device, long-term time trends of when urethral erosion typically occurs may now start to be documented. The device is often seen as a lower risk alternative to AUS with a more simple operative approach. Importantly, any exogenous operative device used for continence has an associated risk of erosion, and if erosion occurs, further attempts at incontinence surgery (e.g., an AUS) are associated with an increased risk of urethral erosion. Currently, no data exists on whether top up of the ATOMS device occurs via an even distribution, and whether a lack of this may be a risk factor for erosion. This requires further research.

Multiple slings are available for treatment of male stress urinary incontinence; yet very little information is available regarding the rate and time frame of urethral erosion,

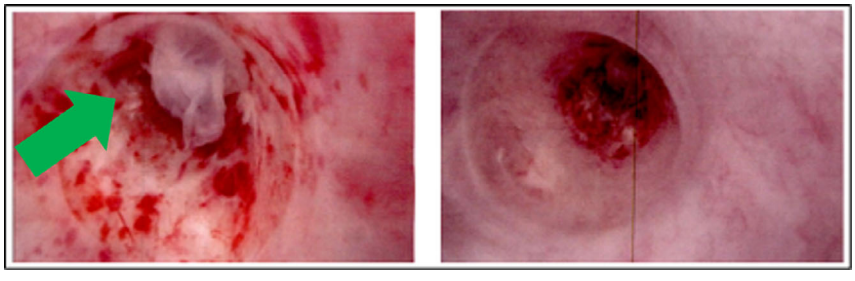

Fig. 1 Cystoscopic images showing bulbar urethral erosion of ATOMS device.

especially post radiotherapy.[17,18] In our case, the patient's recurrence of PPI at 5 years, may have actually represented erosion already occurring, which was further compounded by the top up of the silicone cushion. The rates of urethral sling erosion and efficacy post radiotherapy are important for pre-operative decision-making, as if rates of erosion are similar or higher to AUS, it may be better to place an AUS at the first attempt as further anti-incontinence surgery is likely to be complicated by high failure rates.

Conclusion

The structure of the ATOMS device seems to offer advantages for the treatment of PPI in the setting of an irradiated urethra (good improvement of continence, adjustability, and the preservation of normal voiding). Due to the potentially decreased risk of erosion and urethral atrophy provided by the cushion being placed outside the bulbospongiosus, it is crucial to document the real-world erosion risk and how this may relate to cushion top ups. Patients and doctors can then make informed decisions in the management of incontinence in this complex patient group.

Acknowledgements

Not applicable.

Author contributions

Jessica A Paynter: Conceptualization; writing – original draft; methodology; writing – review and editing; formal analysis; resources; data curation. Kirby R Qin: Writing – original draft; writing – review and editing. Justin Chee: Writing – review and editing. Todd Manning: Writing – review and editing; supervision. Janelle Brennan: Supervision; writing – review and editing; visualization; conceptualization.

Conflict of interest

The authors have no conflicts of interest to declare.

Approval of the research protocol by an Institutional Reviewer Board

The study did not require ethical approval.

Informed consent

Written informed consent has been obtained from the patient to publish this case. The patients consent was required, voluntary and informed.

Registry and the Registration No. of the study/trial

Not applicable.

Data availability statement

Not applicable.

Funding

This research received no external funding.

References

1 Esquinas C, Angulo JC. Effectiveness of adjustable transobturator male system (ATOMS) to treat male stress incontinence: a systematic review and meta-analysis. *Adv. Ther.* 2019; **36**: 426–41.
2 Redmond EJ, Nadeau G, Tu L-M *et al*. Multicentered assessment of clinical outcomes and factors associated with failure of the adjustable transobturator male system (ATOMS). *Urology* 2021; **148**: 280–6.
3 Mühlstädt S, Angulo JC, Mohammed N, Schumann A, Fornara P. Complications of the urinary incontinence system ATOMS: description of risk factors and how to prevent these pitfalls. *World J. Urol.* 2020; **38**: 1795–803.
4 Friedl A, Mühlstädt S, Zachoval R *et al*. Long-term outcome of the adjustable transobturator male system (ATOMS): results of a European multicentre study. *BJU Int.* 2017; **119**: 785–92.
5 Mühlstädt S, Friedl A, Mohammed N *et al*. Five-year experience with the adjustable transobturator male system for the treatment of male stress urinary incontinence: a single-center evaluation. *World J. Urol.* 2017; **35**: 145–51.
6 Hoda MR, Primus G, Fischereder K *et al*. Early results of a European multicentre experience with a new self-anchoring adjustable transobturator system for treatment of stress urinary incontinence in men. *BJU Int.* 2013; **111**: 296–303.
7 Herschorn S, Bruschini H, Comiter C *et al*. Surgical treatment of stress incontinence in men. *Neurourol. Urodyn.* 2010; **29**: 179–90.
8 Desai TJ, Rozanski AT. Artificial urinary sphincter erosion and infection: a contemporary review of perioperative considerations and management. *Transl. Androl. Urol.* 2024; **13**: 857–67.
9 Juliebø-Jones P, Roth I, Tzelves L *et al*. Current status of the adjustable transobturator male system (ATOMSTM) for male stress urinary incontinence. *Front. Surg.* 2024; **11**: 1377788.
10 Angulo JC, Virseda-Chamorro M, Arance I *et al*. Long-term outcome of adjustable transobturator male system for stress urinary incontinence in the Iberian multicentre study. *Neurourol. Urodyn.* 2020; **39**: 1737–45.
11 Téllez C, Szczesniewski J, Virseda-Chamorro M, Arance I, Angulo JC. Update on adjustable trans-obturator male system (ATOMS) for male incontinence after prostate cancer surgery. *Curr. Oncol.* 2023; **30**: 4153–65.
12 Brant WO, Erickson BA, Elliott SP *et al*. Risk factors for erosion of artificial urinary sphincters: a multicenter prospective study. *Urology* 2014; **84**: 934–9.
13 Angulo JC, Téllez C, Giammò A *et al*. Results of adjustable trans-obturator male system in patients with prostate cancer treated with prostatectomy and radiotherapy: a multicenter study. *J. Clin. Med.* 2023; **12**: 4721.
14 Johnson BE, Morey AF. Surgical management of male stress urinary incontinence: artificial urinary sphincter versus male slings. *Curr. Sex. Health Rep.* 2022; **14**: 158–64.
15 Sathianathen NJ, McGuigan SM, Moon DA. Outcomes of artificial urinary sphincter implantation in the irradiated patient. *BJU Int.* 2014; **113**: 636–41.
16 Welk BK, Herschorn S. The male sling for post-prostatectomy urinary incontinence: a review of contemporary sling designs and outcomes. *BJU Int.* 2012; **109**: 328–44.
17 Alwaal A, Harris CR, Awad MA, Allen IE, Breyer BN. Comparison of complication rates related to male urethral slings and artificial urinary sphincters for urinary incontinence: national multi-institutional analysis of ACS-NSQIP database. *Int. Urol. Nephrol.* 2016; **48**: 1571–6.
18 Harris SE, Guralnick ML, O'Connor RC. Urethral erosion of transobturator male sling. *Urology* 2009; **73**: 443.e19–443.e20.