CASE REPORT

A complication of Artificial Urinary Sphincter: migration of pump onto the rectus sheath in a patient with cauda equina syndrome

Michelle Christodoulidou,¹ Mathew Thomas,² Gurpreet Singh¹

¹Department of Urology, Southport and Ormskirk Hospital NHS Trust, Southport, UK

²Department of Urology, Royal Liverpool and Broadgreen University Hospitals, Liverpool, UK

Correspondence to

Dr Michelle Christodoulidou, ematmichelle@hotmail.com

SUMMARY

We describe a very rare complication of migration of Artificial Urinary Sphincter pump device, following an elective implantation in a male patient with significant stress incontinence secondary to cauda equina syndrome. Looking through existing literature there has not been a similar complication reported. Usual complications reported include erosion, infection and mechanical failure.

BACKGROUND

Artificial Urinary Sphincters (AUS) with controllable cuffs were first used in 1972 for the management of incontinence secondary to sphincter weakness. They have been most commonly used in patients with incontinence post radical prostatectomy and incontinence secondary to spinal cord injury.^{1–3}

CASE PRESENTATION

A 33-year-old male patient was admitted for an elective implantation of an AUS (American Medical Systems, AMS-800) for the management of incontinence. His incontinence was secondary to cauda equina syndrome with conus involvement, after a fall and burst fracture of his first lumbar vertebrae (L1) 18 months prior to the AUS implantation. He required an emergency open reduction and internal fixation of his fracture, and he recovered from his injury with good power in both legs, fully ambulant and no loss of perineal sensation. However, he did have long-term bladder and bowel problems. He had significant stress incontinence especially when coughing or sneezing. He performed clean intermittent self-catheterisation (CISC) to manage his urinary symptoms and required laxatives intermittently to treat his constipation.

Video urodynamic study was performed to investigate his bladder and sphincter function. It demonstrated a hypocompliant bladder during the end filling phase and an incompetent sphincter which led to the significant stress incontinence. Stress incontinence is defined by the involuntary leakage of urine with any exertion, cough or sneeze. Compliance in urodynamics is defined by the bladder being able to maintain a stable intravesical pressure from empty to full. In a hypocompliant bladder the pressure within the bladder rises during the filling phase. After discussion of treatment options, the patient opted for an AMS-800

sphincter implantation to manage his incontinence which was his most troublesome symptom.

The AUS has three parts: the reservoir, the pump and the cuff which is placed around the urethra. The operation was uneventful and the pump was placed in the right hemiscrotum. He was discharged 2 days postoperatively and had an outpatient appointment in 6 weeks to activate his AUS. Ten days postoperatively, he presented to the emergency department—unable to feel the pump in his scrotum. Examination of his scrotum confirmed the absence of the pump.

INVESTIGATIONS

An X-ray revealed that the pump had migrated to the suprapubic region (figure 1). Clinically the pump was not palpable in this area (figure 1).

TREATMENT

A planned exploration of the suprapubic area revealed the pump to be lying superior to the rectus sheath. The components of the sphincter and connections were intact. The pump was placed in the left hemiscrotum this time and a purse-string suture was used to ensure the pump remained within the scrotum.

Figure 1 X-ray of the pelvis revealing the sphincter pump (blue arrow) in the suprapubic area with the reservoir (red arrow) and the cuff (green arrow) in place.

To cite: Christodoulidou M, Thomas M, Singh G. *BMJ Case Rep* Published online: [please include Day Month Year] doi:10.1136/bcr-2013-010308

OUTCOME AND FOLLOW-UP

When reviewed postoperatively in outpatients, he reported of slight discomfort in the left scrotum. Mild inflammation was present, but no obvious sign of infection. A prophylactic course of ciprofloxacin was started to prevent infection of the implant. A further review revealed the inflammation had settled. The sphincter was activated 6 months after his second operation and has since been working satisfactorily.

DISCUSSION

AUSs with a controllable cuff (AMS 721) were initially introduced in 1972 and the latest model AMS 800 was introduced in 1987.¹⁻⁴

This system consists of a pressure regulating balloon reservoir in the prevesical space, a pump which is implanted in the scrotum or labium majorum and the cuff which is placed around the bulbous urethra or bladder neck.¹ We used a traditional approach of a midline perineal incision. The urethra was dissected circumferentially to accommodate the cuff. The balloon was placed in the prevesical space beneath the rectus muscle through a suprapubic incision. The pump was placed in a dependent subdartos pouch in the hemiscrotum ipsilateral to the balloon, and all the tubes were connected. Purse-string sutures are not routinely used in practice to close the subdartos pouch in the scrotum.

Migration of the pump from the scrotum is a rare presentation. Normally, AUS devices remain deactivated for at least 6 weeks after implantation to allow healing and formation of scar tissue.⁵⁻⁷

Reported complications following AUS insertion are: scrotal or labial haematomas,⁴ urinary retention requiring CISC,⁴ infection or erosion of the cuff,¹⁻³ system failure due to blockage, kinks or disconnecting of the connecting tubing and leakage of fluid from the closed system.^{1,5}

From literature search we found only one case of migration, where the reservoir from the AUS device migrated intravesically.⁴ This patient had salvage prostatectomy after radiotherapy and he underwent a placement of AMS 800 urinary sphincter. Unfortunately, he had cuff erosion and therefore this was surgically removed and the system was deactivated. A year later a large bladder stone was found and was removed transvesically. It was found to contain a calcified reservoir balloon.⁴

In our case the pump had migrated onto the rectus sheath. Although a formation of a false passage between the subcutaneous tunnel in the right hemiscrotum and the suprapubic area was considered, this was not confirmed during the second operation. The patient denied any injury to area prior to the pump migration. We are unsure of the cause of this presentation, and as mentioned previously the placement of a pump in this area is

practiced routinely and does not require sutures to keep in place. This complication was discussed with other urology departments where AUS devices are implanted on a weekly basis and no clear explanation could be found.

Another complication we faced was the presence of inflammation in the left scrotum after the second operation. This could have put the device at risk of infection, erosion and system failure. Eventually this settled and the wound healed, allowing activation of the device which has since been working well.

Learning points

- Migration of any part of an Artificial Urinary Sphincter (AUS) is a rare but possible complication and should always be considered.
- X-ray is a valuable tool in viewing the placement of the device in cases where migration is suspected.
- AUS device infection and erosion are serious risks associated with the implantation and can lead to mechanical failure and deactivation of the system. It is important to maintain a sterile technique during the implantation and to monitor closely the area if any inflammation occurs that could put the device at risk.

Contributors MC wrote the manuscript whereas MT and GS reviewed and edited it.

Competing interests None.

Patient consent Obtained.

Provenance and peer review Not commissioned; externally peer reviewed.

REFERENCES

- 1 Hamilton S, Flood HD, Shetty MK, *et al.* Radiology of the AS 800 Artificial Urinary Sphincter; normal appearances, complications. *Eur J Radiol* 1991;1:122-5.
- 2 Martins FE, Boyd SD. Post-operative risk factors associated with Artificial Urinary Sphincter infection-erosion. *Br J Urol* 1995;75:354-8.
- 3 Kill PJM, Devries JDM, Van Kerrebroeck PEVA, *et al.* Factors determining the outcome following implantation of the AMS 800 Artificial Urinary Sphincter. *Br J Urol* 1989;64:586-9.
- 4 Bartoletti R, Gacci M, Travaglini F, *et al.* Intravesical migration of AMS 800 Artificial Urinary Sphincter and stone formation in a patient who underwent radical prostatectomy. Case Report. *Urol Int* 2000;64:167-8.
- 5 Rose SC, Hansen ME, Webster GD, *et al.* Artificial Urinary Sphincters: plain radiography of malfunction and complications. *Radiology* 1998;168:403-8.
- 6 Wilson SK, Delk JR. Ectopic placement of AMS 800 urinary control system pressure regulating balloon. *Surg Tech Urol* 2005;65(1):167-70.
- 7 Bestard Vallejo JE, Garcia Montes F, Cecchini Rosell L, *et al.* Implantation technique of Artificial Urinary Sphincter "Flowsecure™" in the bulbar urethra. *Arch Esp Urol* 2009;62:195-200.

Copyright 2013 BMJ Publishing Group. All rights reserved. For permission to reuse any of this content visit

<http://group.bmj.com/group/rights-licensing/permissions>.

BMJ Case Report Fellows may re-use this article for personal use and teaching without any further permission.

Become a Fellow of BMJ Case Reports today and you can:

- Submit as many cases as you like
- Enjoy fast sympathetic peer review and rapid publication of accepted articles
- Access all the published articles
- Re-use any of the published material for personal use and teaching without further permission

For information on Institutional Fellowships contact consortiasales@bmjgroup.com

Visit casereports.bmj.com for more articles like this and to become a Fellow