

Robotic-assisted artificial urinary sphincter implant complicated by ureteric obstruction

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Robotic-assisted surgery is gaining popularity for the implantation of artificial urinary sphincters (AUS) in female patients.

We present a case of a 76-year-old woman with refractory stress urinary incontinence. She underwent an uncomplicated robotic-assisted AUS implant. Post activation of the system, she experienced right-sided flank pain and developed urosepsis shortly thereafter.

On imaging with an activated system, grade 3 hydro-ureteronephrosis (HUN) was seen.

Robotic-assisted revision showed a right-sided ectopic ureter draining towards the bladder neck, which was compressed on activation of the system. A new cuff was successfully placed distal to the orifice with complete continence 3 months after the procedure.

Key Words: robot assisted surgery ↔ artificial urinary sphincter ↔ stress urinary incontinence

CASE REPORT

A 76-year-old woman was referred by our urogynaecology colleagues for stress urinary incontinence refractory to previous incontinence surgery. She underwent a TVT-O placement in 2018 with a subsequent retropubic (TVT) sling in 2022. Despite these two procedures she was still suffering from severe incontinence ranging from 200–500 ml per 24 hours regarding her bladder diary, depending on the level of physical activity.

She underwent hysterectomy in her mid-forties and suffered from a transient ischemic attack in 2023 after which she was diagnosed with atrial fibrillation and was put on direct oral anticoagulants.

Urological history showed clear signs of stress urinary incontinence without raising suspicion for the presence of overactive bladder.

On clinical examination, there were no mesh-related complications; no erosion or extrusion of the previously placed material. Clear incontinence was noted when performing the Valsalva manoeuvre without urethral hypermobility.

Cystoscopy showed no mesh-related problems of the urethra or bladder. Intravesical inspection was normal besides more pronounciation of the bladder rugae and oedema on the right side of the bladder base and trigone. The physician did however report an orthotopic left and right ureteric orifice (UO).

On video-urodynamic testing, a rather small maximal cystometric capacity of 300 ml was seen, and low-pressure filling was measured without detrusor overactivity. Low urethral closing pressure was seen with funnelling of the bladder neck. Normal voiding phase was noted with a maximal detrusor pressure of 21 cmH₂O.

After discussion of the different treatment options, she opted for robotic-assisted placement of an artificial urinary sphincter (AUS).

AUS placement was performed on 04/04/2024 using the DaVinci Xi® robotic system, with a posterior approach. The Boston Scientific AMS800® AUS was placed without complications and a console time of 140 minutes. A 7.5 cm cuff size was used and was correctly positioned at the level of the bladder neck. Recovery was smooth with discharge on postoperative day one. The initial 6 weeks went as planned, with per-protocol activation of the system 6 weeks after surgery. Cycling of the system by the physician as well as by the patient went in standard fashion after which she was sent home. A few hours after activation, she was readmitted through the emergency department due to a slight fever and severe right-sided flank pain. Subsequent imaging (CT-urography) showed a dilated right-sided collecting system and ureter up to the level of the sphincter cuff (Figure 1).

The pain decreased, and hydronephrosis resolved on ultrasound after deactivation of the system, thus raising suspicion about ureteric involvement in the AUS cuff.

This diagnosis was confirmed on subsequent investigation under general anaesthesia. Although stated in pre-operative workup, no orthotopic UO could be seen on the right side. Presumably, visualisation of the right side of the bladder was skewed in the outpatient clinic due to pronounced bladder rugae and bladder oedema. When deacti-

vating the cuff, there was the impression of the UO located on the bladder neck, but catheterisation of this UO was impossible.

After discussion with the patient, a robotic-assisted revision was carried out on 21/01/2025. The bladder was dropped, and the cuff dissected and released. Hereafter, the right UO could be seen cystoscopically, situated on the proximal bladder neck (Figure 2) and being compressed by the cuff. Stents were placed bilaterally, after which dissection was carried out one centimetre more distally, where a new cuff could be placed. Due to the more distal position, a 6-centimetre cuff size was used. Cystoscopic control with inflation and deflation of the cuff showed no compression of either UO.

The patient was discharged on postoperative day one, the system was activated after 6 weeks without further complications, and complete continence was achieved three months post-operative.

DISCUSSION

AUS is widely recognized as the gold standard treatment for male stress urinary incontinence, particularly post-prostatectomy [1]. In recent years AUS is gaining popularity for female incontinence mainly due to the implementation of robotic assisted implantation. Work has been done to describe a standardisation of the robotic implantation technique [2, 3], nevertheless patient selection and surgeon experience remain essential in achieving optimal outcomes.

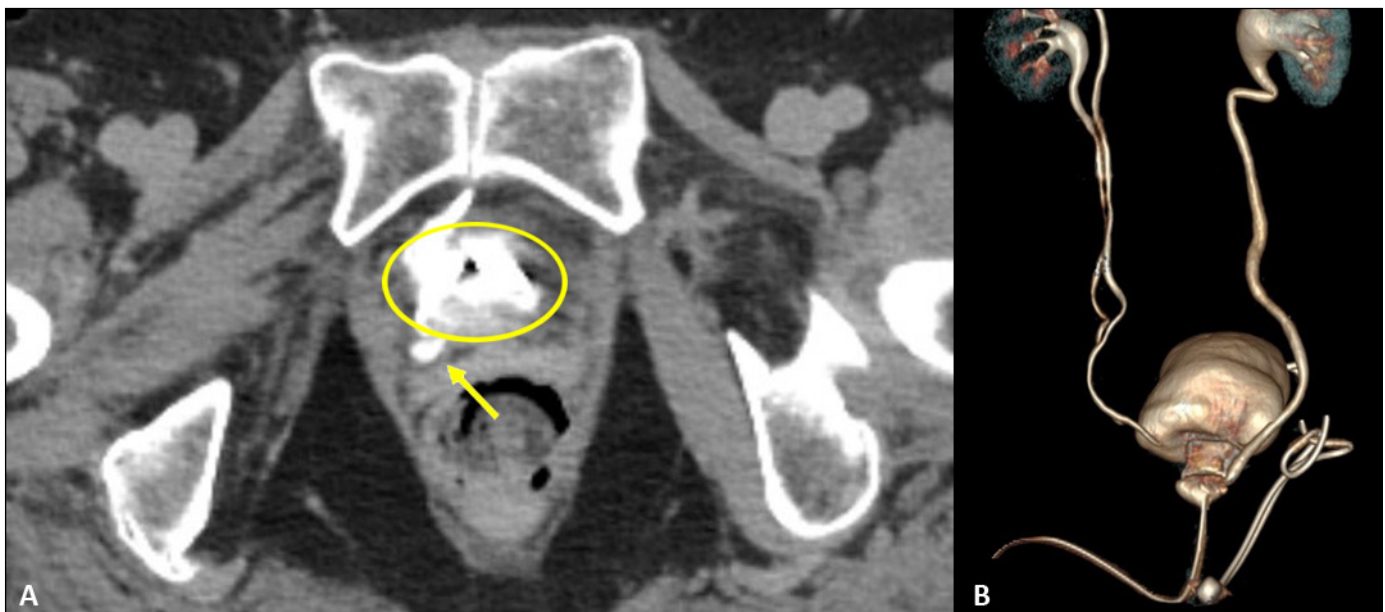


Figure 1. CT-urography showing right ureteric involvement in AUS cuff: **A)** CT-urography, tapered distal right ureter (arrow) towards the AUS cuff (circle); **B)** posterolateral 3D reconstruction.

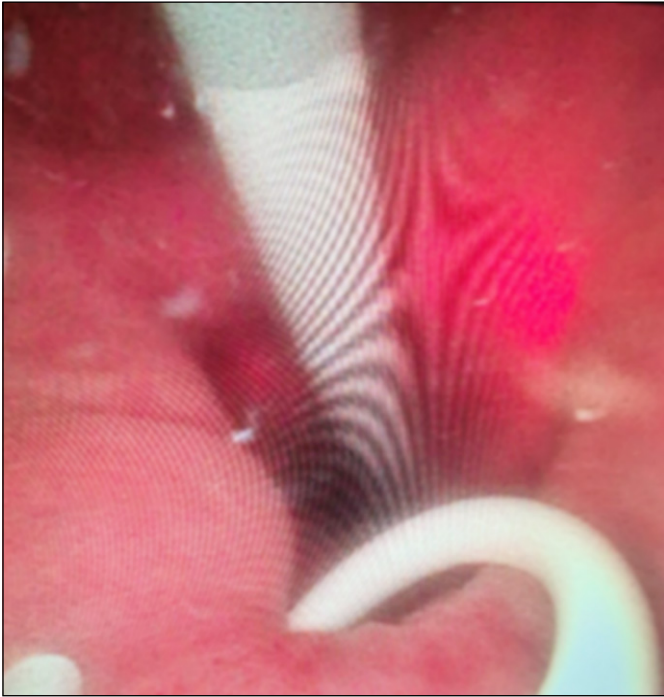


Figure 2. Endoscopic image in retroflexion showing the right UO on the bladder neck.

Recent data on 101 women report high patient satisfaction with 80.4% of patients being either “very much improved” or “much improved” at one-year post-implantation on PGI-I (Patient Global Impression of Improvement) score. Continence rates from the same paper at 18 months follow-up were com-

plete continence in 67.3%, improved in 10.9% and unchanged or worsened in 21.8% [4].

Complications, however, are not uncommon. Most studies are focusing on mechanical failure, device erosion, or urethral atrophy [5]. Current literature is less focused on intra-operative complications. Mainly, iatrogenic vaginal perforation and urethral or bladder neck injury during cuff placement are described, particularly in patients with prior pelvic surgery, radiation, or compromised urethral tissue [4, 5].

To the best of our knowledge, we present the first described case of ureteric involvement in the AUS cuff. In our case, this was due to an aberrant UO in this patient. Theoretically, this can also be an issue with duplex systems, where the upper pole moiety can also be implanted on the bladder neck or proximal urethra.

With an incidence of 1.5–2.5%, duplex systems are not a rare condition, especially in the female population [6]. With a growing interest in female AUS, we believe it is essential to check for aberrant ureteric anatomy on available imaging and to perform a pre-operative cystoscopy to check for UO position.

CONFLICTS OF INTEREST

The authors declare no conflict of interest.

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ETHICS APPROVAL STATEMENT

The ethical approval was not required.

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