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Voiding dysfunction
Original article

Use of the adjustable trans-obturator male sling system for the treatment of male incontinence. An initial experience

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Abstract
Objective: To evaluate the safety and efficacy of the "Adjustable Trans-Obturator Male Sling System (ATOMS)" as a new surgical technique for the treatment of different types of male urinary incontinence.
Subjects and methods: Between March 2012 and December 2013, 9 patients with a mean age of 56 (range 15–74) years were operated for urinary incontinence using the ATOMS system. Incontinence had developed following bladder exstrophy repair in 2, after radical cystectomy with construction of an orthotopic neobladder in 3, after transvesical open prostatectomy in one and after radical prostatectomy in 3 patients. Preoperative evaluation included a detailed medical history, physical examination, 24-h pad tests, urodynamic assessment and sonography.
Results: The mean number of pads used preoperatively was 4.6 (range 3–6). The mean operative time was 45 (range 36–50) min. No intraoperative complications were encountered. The mean hospital stay was 3.8 (range 3–6) days. Transient perineal/scrotal pain was observed in 6 patients (66.7%) and controlled with non-opioid analgesics. There were no perineal infections; however, two port infections occurred (22.2%) and repositioning of the port was done in these cases. At a mean follow-up of 9 (range 6–12) months, the overall success rate was 100% with 77.8% of the patients being completely dry (0 pads per 24 h) and 22.2% using less than 2 pads per 24 h.
Conclusions: Our early experience demonstrated that the ATOMS system may be a safe and effective procedure for the treatment of male urinary incontinence. It has the advantage of being feasible any time after an operation when necessary. However, long-term follow-up on a large number of cases is required to ensure its long-term efficacy and safety.

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Introduction

Male stress urinary incontinence (SUI) is a devastating complication mainly occurring after prostatectomy and having a significant impact on the patient's quality of life [1]. The incidence of post-prostatectomy SUI has been reported to be as high as 1–48% [2].

Treatment options include minimally invasive procedures such as electrical stimulation and bio-feedback. However, a poor outcome and their limitation to mild cases have prevented their popularity [3]. Despite the high success rate of the artificial urinary sphincter (AUS), its high cost and the risk of mechanical failure are major drawbacks. The concept of using sling material for the treatment of male SUI has been recently introduced with many advantages and promising results on short and intermediate-term follow-up [4]. However, a lack of postoperative adjustment and the risk of dislocation of the device due to insufficient anchorage which, in turn, compromise cure rates have been reported to be the main drawbacks of sling procedures.

The ATOMS system was developed to overcome these difficulties with the option of simple, minimally invasive postoperative adjustment. Using this system, a success rate of 80% has been reported in patients with post-prostatectomy incontinence [5]. Since its effectiveness in treating male SUI due to causes other than post-prostatectomy SUI has never been addressed, this study was designed to investigate the versatility of ATOMS for the treatment of male SUI due to different etiological factors.

Subjects and methods

Between March 2012 and March 2013, 9 men with a mean age of 56 (range 15–74) years were operated using the ATOMS system. They were suffering from mild to severe SUI which had developed following radical prostatectomy in 3, open prostatectomy in one, bladder exstrophy repair in two and radical cystectomy with orthotopic neobladder construction in 3 patients (Table 1).

All patients underwent preoperative evaluation including a detailed medical history, physical examination and gray-scale ultrasonography for the evaluation of the upper urinary tract as well as the assessment of the post-void residual (PVR) urine volume. Urinalysis and culture were carried out. All patients were subjected to retrograde urethrography in order to exclude concomitant strictures. A pressure flow study was carried out in accordance with the International Continence Society (ICS) guidelines. A 24-hour pad test was carried out and the number of pads used was recorded. Urinary incontinence was considered mild, moderate or severe depending on the number of pads used per day.

Table 1 Types of patients.

Cause of incontinence	Number of patients
Post radical prostatectomy	3
Post transvasical prostatectomy	1
Post bladder extrophy repair	2
Post radical cystectomy with orthotopic neobladder	3

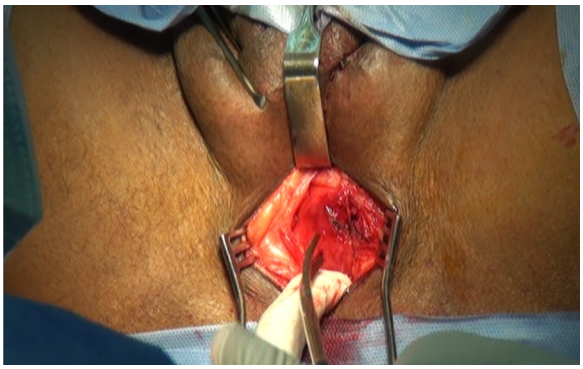

Fig. 1 Operative picture showing exposure of bulbospongiosus muscle, to create a space between the bulbospongiosus and ischiocavernosus muscles.

Surgical technique

All surgical procedures were carried out under spinal anesthesia. The patients were positioned in a modified lithotomy position. The skin was washed with a povidone–iodine solution. All patients were given a 3rd generation cephalosporine prior to surgery. After draping the patient with a sterile covering, an 18Fr Foley catheter was inserted. A medial vertical perineal incision of approximately 5 cm was made, with sharp dissection of the Colles fascia and exposure of the bulbospongiosus muscle, and a space was created between the bulbospongiosus and ischiocavernosus muscles (fossa ischiorectalis) (Fig. 1).

Application of ATOMS

The ATOMS system consists of a mesh implant with an integrated adjustable cushion, protection sheet and titanium port for the adjustment of the cushion volume. The silicone cushion is located in the middle of the mesh tape and filled intra- and postoperatively via the port and catheter (Fig. 2).

The system was implanted in all patients using an outside-in technique. The obturator foramen was passed subcutaneously with a helical tunneller. The mesh arms were drawn back to the central part of the cushion and sutured, thus anchoring the ATOMS device to the inferior pubic ramus. The titanium port was placed subcutaneously deep in the inguineal region and secured with two non-absorbable sutures. The perineal and suprapubic wounds were rinsed with saline solution and closed in multiple layers (Figs. 3 and 4).

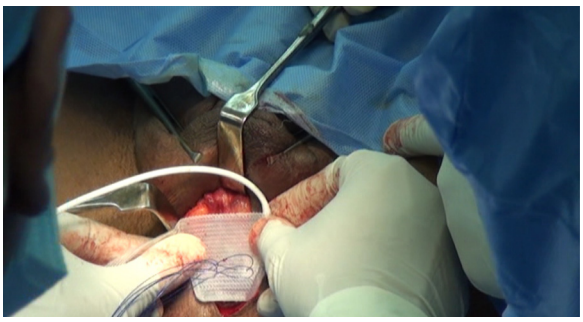

Fig. 2 Operative picture of application of the silicone cushion to measure if the dissected space is appropriate for its size or not.