Tandem Transcorporal Artificial Urinary Sphincter Cuff Salvage Technique: Surgical Description and Results

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Purpose: Complications associated with placement of artificial urinary sphincter may make reoperation necessary. We present a surgical description and outcome data for tandem transcorporal artificial urinary sphincter salvage technique for nonmechanical artificial urinary sphincter failure.

Materials and Methods: A retrospective analysis from July 2002 to December 2005 identified 198 consecutive men who underwent artificial urinary sphincter placement by a single surgeon (DSE) for postoperative stress urinary incontinence. Tandem transcorporal salvage artificial urinary sphincter surgery was performed in 18 patients with 1 (10 of 18) or both (8 of 18) cuffs placed transcorporally. Etiology of previous artificial urinary sphincter failure leading to the insertion of both cuffs in the transcorporal position included 3 infections, 2 erosions, 2 impending erosions, and 1 failed male sling. A self-administered standardized questionnaire was used to assess continence and quality of life outcomes.

Results: At a median followup of 26 months (IQR 14 to 30), pad use decreased from a median of 5.0 (IQR 3.5 to 5) to 2.0 (IQR 1 to 3) ($p < 0.001$). Two patients experienced explantation of the device (1 erosion, 1 infection) without reimplantation and, thus, were excluded from outcome analysis. Eleven (69%) required 2 or fewer pads daily, and 5 (31%) required 3 pads daily. Eleven (69%) reported being very or extremely improved. Of the 5 patients reporting some or no improvement 4 were also on androgen deprivation therapy, suggesting that the transcorporal technique may be less durable in this group of patients.

Conclusions: Tandem transcorporal artificial urinary sphincter placement is an effective approach to salvage cases with a high risk of repeat erosion or infection after failed artificial urinary sphincter placement.

Key Words: prostatectomy; quality of life; urinary incontinence, stress; urinary sphincter, artificial

Artificial urinary sphincter implantation is an effective treatment for intrinsic sphincter deficiency following radical prostatectomy and transurethral resection of the prostate.[1] Since the introduction of the narrow back cuff in 1987, mechanical durability has significantly improved.[1] However, a reoperation rate of 17% to 21% has been reported since this design improvement due to mechanical and nonmechanical factors.[1,2]

Several techniques have been reported for salvage AUS implantation due to nonmechanical failure including tandem cuff placement, cuff downsizing[3] and cuff relocation.[4] Specifically, tandem cuff placement has been reported as an effective approach in the salvage setting by our institution and others.[5,6] In addition, a recent report by Guralnick et al describes distal bulbar urethral AUS implantation using a transcorporal approach after failed AUS implantation at the proximal bulbar urethra.[7] The authors of this study noted that the additional bulk provided by the transcorporal approach facilitated successful salvage in patients with multiple previous urethral erosions. In addition, avoiding dissection of the urethra from the corporal bodies in the salvage setting minimizes the chance of urethral thinning that may predispose the patient to erosion. Combining the approach of tandem AUS cuff configuration with transcorporal placement in the salvage setting provides an attractive option when surgical planes are effaced and risk of urethral injury is high. We report the results of our experience with the transcorporal placement of 1 or both AUS cuffs in a tandem configuration in the salvage setting.

MATERIALS AND METHODS

Patient Selection

Upon approval from the Mayo Clinic Institutional Review Board, retrospective review revealed 198 AUS placements in men by a single surgeon (DSE) from July 2002 to December 2005. Subsequently, 18 patients were identified that had tandem AUS placement with 1 or both cuffs placed transcorporally including 10 with the distal cuff implanted in a transcorporal fashion to supplement an existing proximal bulbar urethral cuff implanted in the standard fashion (fig. 1, *A*). The indication for this approach was cystoscopic evidence of a functioning proximal cuff without evidence of impending urethral erosion with incontinence of 3 or more pads per day. The remaining 8 patients had distal and proximal cuffs placed in a transcorporal fashion (fig. 1, *B*). The primary indication for this approach is salvage AUS placement after erosion or infection. In this setting, when tissue planes were found to be effaced, safe dissection of the urethra from the corporal bodies posed a risk of urethra

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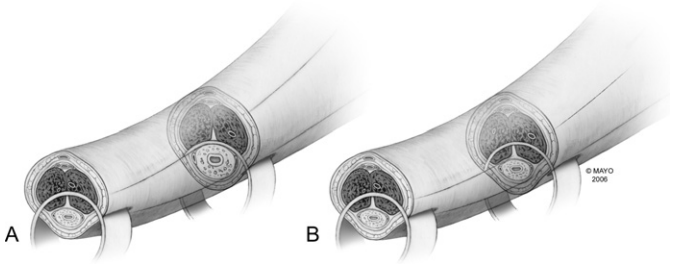

FIG. 1. Difference in transcorporal cuff configuration. Single transcorporal cuff on distal bulbar urethra placed in tandem with existing cuff in standard position on proximal bulbar urethra for treatment of subcuff atrophy (*A*). Transcorporal cuffs on distal and proximal bulbar urethra placed in tandem for salvage after infection or erosion of previous AUS (*B*).

injury. Thus, an intraoperative decision was made to perform tandem transcorporal cuff placement to provide the highest chance of urinary continence while minimizing the risk of intraoperative urethral injury and postoperative urethral erosion. Followup information was obtained from chart review, surgical records and standardized questionnaire. Data including the etiology of incontinence, number and date of previous urethral surgeries, cuff size and implantation location, preoperative pad use, and postoperative complications were noted. In addition, confounding factors including prior radiation therapy and androgen deprivation therapy were noted (table 1). Degree of postoperative continence was assessed by standardized questionnaire. In addition, quality of life was assessed in 16 patients who completed the IIQ-7 and UDI-6.[8] Analysis of the data from the IIQ-7 and UDI-6 was identical to the process described by Haab et al for assessment of continence in men after AUS placement.[9] Specifically, both questionnaires were scored on a scale from 0 (excellent continence) to 100 (severe incontinence).[9] Followup was defined as the date of transcorporal AUS surgery to the date of questionnaire completion. Statistical analyses were done using SAS® version 8.2. The Wilcoxon signed rank test was used to compare pad use before and after tandem transcorporal cuff placement and the Wilcoxon rank sum test was used to compare IIQ-7 and UDI-6 results of the 2 surgical configurations (fig. 1).

Surgical Technique

Preoperative parenteral antibiotics were administered in all cases. The standard regimen includes vancomycin and gentamicin. In the 10 patients undergoing distal transcorporal AUS placement in tandem with an existing AUS cuff at the standard site on the proximal bulbar urethra, the AUS was deactivated in standard fashion. A 14Fr urethral catheter was placed following standard 10-minute povidone-iodine skin preparation.

In all patients a perineal incision was made. Dissection was performed through the previous surgical field that often contained effaced tissue planes and abundant scar tissue. With a combination of meticulous sharp and blunt dissection the bulbar urethra and corpora cavernosa were exposed. The site of previous urethral surgery was noted. The exact location of transcorporal cuff placement was selected intraoperatively. For the 8 patients undergoing transcorporal placement of both cuffs, 1.5 cm corporotomies were performed 0.5 cm lateral to the proximal bulbar urethra. A right angle clamp was used to enlarge the corporotomy and a window developed in the corporal tissue. The corporal septum was perforated and the window extended through the contralateral corporal tissue. A Penrose drain was passed through this window and the urethra subsequently measured (video segment 1). The most proximal site before corporal body separation was typically selected for proximal cuff placement. The distal transcorporal cuff site was than selected 1 cm from the proximal cuff. Using the same approach

TABLE 1. *Clinical features by tandem transcorporal cuff configuration*

	Proximal + Distal Transcorporal Cuff Placement	Proximal Standard + Distal Transcorporal Cuff Placement	Totals
No. pts	8	10	18
Median age at surgery (IQR)	77 (72–80)	79.5 (76–81)	78 (72–81)
Median mos followup* (IQR)	19 (10–26)	30 (22–35)	26 (14–30)
No. etiology of incontinence:			
Radical retropubic prostatectomy without radiotherapy	5	7	12
Radical retropubic prostatectomy with radiotherapy	2	2	4
Transurethral prostatic resection	1	1	2
No. androgen deprivation therapy	2	3	5
Prior urethral surgeries:			
Median (IQR)	2.5 (1.5–4.5)	1 (1–2)	1.5 (1–2)
No. AUS	7	10	17
No. male sling	1	0	1
Median mos last urethral surgery to tandem transcorporal surgery (IQR)	8.8 (6.8–30.6)	78.4 (73.3–94.3)	54.8 (9.9–90.8)
No. indication for transcorporal AUS:			
Subcuff atrophy	2	10	12
Previous AUS infection	3	0	3
Previous AUS erosion	2	0	2
Previous male sling	1	0	1
No. proximal cuff size (cm):			
4.0	1	2	3
4.5	7	8	15
No. distal cuff size (cm):			
4.0	1	2	3
4.5	7	8	15

* Explantation without subsequent reimplantation in 2 cases led to exclusion.