Surgical Management of Recurrent Stress Urinary Incontinence Following Artificial Urinary Sphincter Placement due to Urethral Atrophy Utilizing the Mature Cuff Pseudocapsule

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Introduction: Urethral atrophy is a common cause of recurrent stress urinary incontinence (SUI) following artificial urinary sphincter (AUS) implantation. Traditional management includes cuff downsizing or repositioning, altering the pressure-regulating balloon (PRB), or bulbar urethral modification. We describe a novel AUS revision technique utilizing the mature cuff pseudocapsule to restore urethral bulk, while minimizing perineal dissection and corporal involvement.

Methods: Patients with urethral atrophy and recurrent SUI who underwent AUS revision between 09/2005 and 03/2025 were retrospectively reviewed. All underwent removal and replacement of all three AUS components. The cuff was reimplanted utilizing the existing bulbourethral pseudocapsule (Figure 1a-d).

Surgical Technique:

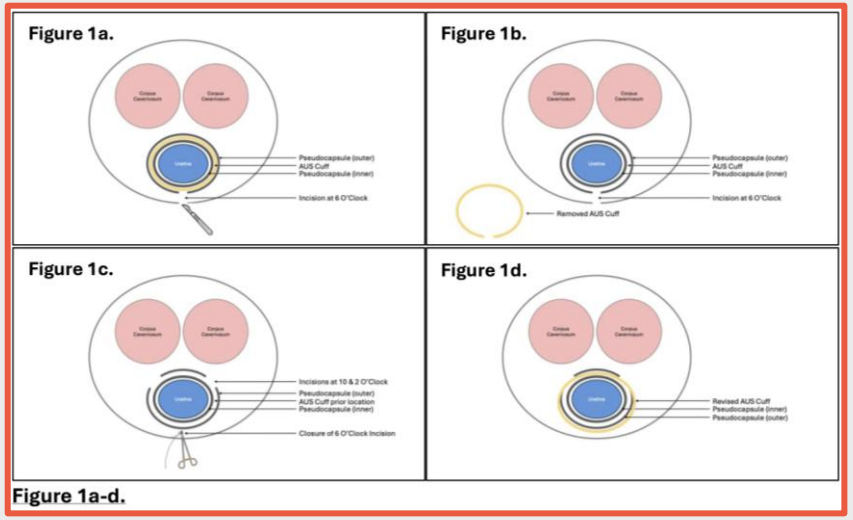


Figure 1a-d.

1a. Urethral anatomy showing the inner and outer pseudocapsule layers surrounding the original AUS cuff.
1b. Original AUS cuff removed with pseudocapsule preservation.
1c. Two 2cm posterolateral incisions are made in the outer pseudocapsule.
1d. New AUS cuff is placed circumferentially around the bulbar urethra, passing between the pseudocapsule layers dorsally, through the posterolateral incisions, and along the external surface of the outer pseudocapsule ventrally.

Results: Twenty-nine patients met inclusion criteria. Mean age at initial AUS placement was 67.1 years (range 49-76). Mean time to revision was 5.1 years (range 2.3-13.8) and mean follow-up after revision was 42.0 months (range 12-116). Two patients underwent explantation for infection and two required AUS removal for cuff erosion following catheterization.

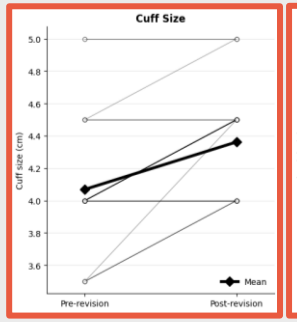


Figure 2 - Median cuff size increased from 4.0cm (range 3.5-5.0) to 4.5cm (range 4.0-5.0).

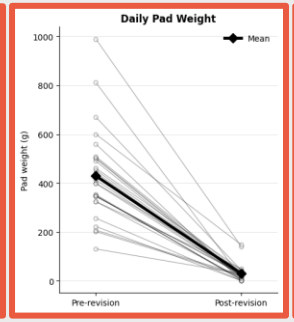


Figure 3 - Mean daily pad weight decreased from 423g (range 130-990) to 29g (range 0-147) ($p<0.05$).

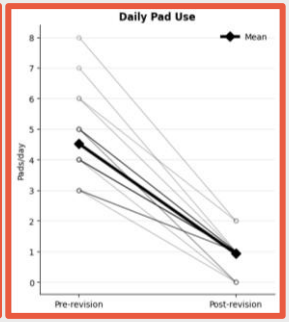


Figure 4 – Mean daily pad use decreased from 4.5 (range 2-8) to 0.9 (range 0-2) ($p<0.05$).

Conclusions:

- AUS revision utilizing the original cuff pseudocapsule significantly reduced pad use and weight in patients with urethral atrophy.
- The technique restores urethral bulk, minimizes perineal dissection, avoids transcorporal placement, and represents a viable surgical option for recurrent SUI after AUS implantation.