New Enhancements of the Transverse Scrotal Surgical Technique for Placement of the Artificial Urinary Sphincter Allows More Proximal Placement of Cuffs

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Abstract

Introduction: Traditional artificial urinary sphincter (AUS) implantation requires the patient be placed in lithotomy, a perineal incision for cuff placement, and a inguinal incision for reservoir and pump placement. We believed AUS could also be placed more through one transverse scrotal incision (J Urol 169:261, 2003). Cuffs placed in this procedure were usually 4.0 cm. Questions about the efficacy of one transverse scrotal incision have focused on the frequency of 4.0 cm cuff placement. To effect a more proximal cuff placement in transverse scrotal approach, we report enhancements to the original technique with improved proximal cuff placement and resultant use of a preponderance of 4.5 cm cuffs.

Methods: In this new approach, the surgeon stands between the patient's mildly abducted and minimally flexed legs, uses the new SKW Scrotal Retractor System (AMS) modified by the addition of two deep rake shaped retractors for deep bulb exposure, uses a rolled Raytex sponge placed under the rakes, and uses a weighted "swan neck" vaginal speculum over the rakes to further facilitate urethral exposure. First time AUS patients and patients requiring revision were implanted with both perineal and scrotal cuff placement.

Results: Improved exposure of the proximal bulb in all three categories of patient: virgin implantation, revision of scrotal placed cuff, and perineal placed cuffs. The bulbocavernosus muscle required dissection with 4.5 cm cuffs deployed more often than 4.0 cm cuffs.

Conclusions: New enhancements to the transverse scrotal technique of AUS allows more proximal cuff placement as evidenced by the use of larger cuffs.

Introduction

Surgical placement of an AMS 800 Urinary Control Device (AUS) traditionally has required a perineal incision for placement of the cuff and an additional abdominal incision for placement of the pressure regulating balloon and pump.1 We believed AUS could be placed easier and quicker through one transverse scrotal incision.2 Since publication of the article 7 years ago describing the surgical technique of the transverse scrotal incision, the number of AUS in this country has almost tripled and almost 70% are now done through the new one-incision technique.3 Despite the popularity of transverse scrotal sphincters, one series reported better outcomes with the perineal two-incision approach.4 Recently Henry et al published comparison of patient outcomes with the original, traditional two-incision technique and the new one-incision procedure. Henry's study found patients with the one incision placement were less likely to be socially continent.5 In a similar comparison, Sotelo and Westney addressed patient outcomes when they compared their transcrotal results in 83 high-risk patients with the literature implanted in the traditional technique. In disagreement with Henry's study, they concluded "outcomes for pad use after surgery, rate of erosion, infections and mechanical malfunctions were similar to those in other series using the traditional approach.6 Henry's comparative study also indicated that perineal incision placement of the cuff resulted in a preponderance of 4.5 cm cuffs being employed versus the scrotal technique that utilized a majority of 4.0 cm cuffs. The theory was that the urethra narrows from proximal to distal bulb and a higher usage of smaller cuffs would indicate that the one incision technique resulted in more distal bulb placement when compared to the perineal incision placement.

(Introduction continued on next page)
New surgical techniques are a work in progress. Some of the transcrotal patients used for Henry’s comparison were operated very early in the development of the technique. Since publication of the original description of the one incision technique in January 2003, adjustments, and utilization of new instruments have been made. We believe these enhancements effect deeper placement of the cuff on the proximal bulb. We describe these techniques.

Surgical Technique

Positioning of the patient in the original description was with the legs gently abducted and the surgeon standing on the right hand side of the table. We have since found that better bulbar exposure can be obtained with the legs gently abducted, knees slightly flexed and surgeon standing between the legs. It must be stressed that this positioning is not classic lithotomy as in the perineal approach to cuff placement. In our opinion, lithotomy puts the urethra on stretch making it less mobile and more difficult to dissect the back wall free from surrounding tissues.

Coincident with publication of the one incision AUS, we introduced the SKW Scrotal Retraction System (distributed by American Medical Systems, Minnetonka, MN) to facilitate transverse scrotal incision use for both penile implants and AUS. The SKW Retraction System has a sharp hook for placing the penis on stretch and 7 blunt hooks to secure the scrotal incision upon the penoscrotal area. It contains a self-retaining retractor, a penile strap and two plastic baby Deavers. In an effort to make proximal dissection of the urethra easier we have modified the retractor components. The tensile strength of the hooks has been increased making them less likely to stretch and two large rake hooks have been added. Figure 1

The transverse scrotal incision is made and blunt hooks applied at 1:00, 3:00, 5:00, 7:00, 9:00, and 11:00. The tunica albuginea is exposed on each corporal body. Metzenbaum scissors are then passed along the outside surface of both tunicas to the proximal corporal body’s insertion on the ischial tuberosity. Next, the plastic baby Deavers are placed in the defect in Buck’s fascia and pulled toward the feet. This results in effectively dissecting both sidewalls of the urethra and places the midline urethral attachment to the raphe on stretch. Sharp dissection incises this scrotal septum and the dissection of the septum and bulbocavernous muscle is continued until the proximal bulb is reached. Placing the rakes deep in the scrotal tissue at 4:00 and 8:00 duplicates the exposure obtained by the Deavers and eliminates the awkwardness of an assistant holding the Deavers. Placing a rolled Raytec sponge (“the cowboy blanket roll”) under the rakes widens their retraction and further improves deep bulbar urethra access. Figure 2

Even better depth of field can then be obtained by then placing a weighted “swan neck” vaginal speculum over the rakes. Figure 3

Figure 1
SKW Retraction System with new rake hooks

Figure 2
Rolled Raytec sponge aka “Cowboy Blanket Roll”

Figure 3
Sponge place under rakes
Sequential employment of these enhancements i.e. first the Raytec sponge underneath the rakes and then the weighted vaginal speculum give the best exposure. Any type of retractor e.g. a medium Richardson can be utilized. The advantage of the weighted vaginal speculum is it does not require an assistant holding it. **Figure 4a and 4b** have allowed placement of the cuff more proximally than when the original technique was described.

**Figure 4a**
Exposure with rake hooks

**Figure 4b**
Exposure improved with weighted speculum

**Discussion**

Use of this change of positioning and new equipment has made it much easier to obtain deep bulbar exposure. The bulbocavemosus muscle is visualized in every case. Use of these enhancements has resulted in a preponderance of 4.5 cm cuffs used rather than 4.0 cm as we employed early in the development of the technique. In viewing photos of cuffs placed early in our experience it is obvious the new enhancements are allowing deeper bulbar placement of the cuff. **Figure 5a and 5b**

**Figure 5a**
Cuff placed 2004

**Figure 5b**
Cuff placed 2008

Without the new enhancements to the surgical technique, in our opinion, it was too easy to abandon urethral dissection before the corpora decussated resulting in a more distal placement of the cuff as witnessed by, early in our experience, the majority of cuffs placed being 4.0 cm.

We have recently accumulated 30 cases of AUS placement utilizing the enhanced transcrotal technique and have submitted the study for publication. In this series, the use of the enhanced scrotal technique has allowed us the opportunity to revise malfunctioning sphincters placed through a perineal incision by very experienced AUS implanters. These cuffs were removed through a scrotal incision despite placement originally via perineal incision. Our experience with these AUS revisions have suggested that our cuff position now seems similar, in most instances, to that by experienced implanters utilizing the perineal incision.

One final point needs to be emphasized concerning AUS in the USA. Occasional (1-3 implants yearly) implanters perform the vast majority of sphincters. There are also centers focused on the treatment of male incontinence that do a large number of sphincters yearly. The combined volume of these focused centers is small compared to the overall number of sphincters done by occasional implanters. This scrotal one-incision method was developed to facilitate AUS implantation by the occasional implanters. In teaching residents, the authors have noted it is quicker, easier and safer (less urethral trauma) for the infrequent sphincter surgeon. It is our hope that the new enhancements to the transverse scrotal technique will encourage the occasional sphincter surgeon to achieve more proximal cuff placement and, hopefully, equivalent continence outcomes when compared to the traditional approach. The authors and one large implant center believe it possible.

**Conclusions**

New surgical techniques are works in progress. New positioning and exposure methods to the transverse scrotal incision technique of AUS allow more proximal cuff placement as evidenced by the use of larger cuffs. It is hoped utilization of these enhancements will encourage deeper cuff placement during scrotal placement of AUS and subsequent outcome studies will confirm a continence rate similar to the traditional surgical technique.


3. Data obtained from Patient Information Forms from American Medical Systems, Minnetonka MN

