Tricks of the Trade

Robotic Urethrovessical Anastomosis: Combining Running and Interrupted Sutures*

Alexander M. Berry, M.D., M.B.A., Fernando Korkes, M.D., Marcos Ferreira, M.D., and Jim C. Hu, M.D., M.P.H.

Problem

FOR SURGEONS EARLY IN THE LEARNING CURVE of laparoscopic or robotic-assisted prostatectomy, the urethrovessical anastomosis may pose a difficult challenge. The use of sounds or perineal pressure to aid needle placement may be technically challenging and time consuming. Furthermore, the use of the Van Velthoven suture with a monofilament suture may lead to uncertainty regarding posterior approximation with possible excess suture tension resulting in tearing of urethral tissue and suture breakage. We present a technique that combines the stability of posterior interrupted suture fixation with the efficiency of a running anastomosis.

Technique

We prefer two absorbable 3-0 polyglactin sutures cut to 6 inches on a CT-3 needle (Vicryl, Ethicon, Somerville, NJ). The poly-Versus monofilament suture material provides greater friction that better holds running suture line tension against the urethrovessical tissue. The anastomosis consists of three knots tied posteriorly on the inside of the anastomosis to allow direct visualization of the posterior vesicourethral apposition, and a single anterior knot tied on the outside of the bladder.

First, place a 6 o’clock posterior urethral suture in an inside-out fashion prior to division of the posterior urethra (Fig. 1). This prevents subsequent urethral retraction, which may require the use of urethral sounds or perineal pressure to facilitate posterior anastomatic suture placement, particularly in obese men. The posterior urethra is then divided and the prostate placed in a laparoscopic bag. After ensuring hemostasis, a corresponding outside-in 6 o’clock bite is placed in the posterior bladder lip. The bladder is parachuted down to the urethral stump with a surgeon’s knot tied on the bladder mucosa, which is critical to maintaining the knot tension. This is accomplished by placing the needle drivers in a “water-skier” position; pulling in a 45-degree anterior-cephalad direction (Fig. 2). Bladder advancement is facilitated by decreasing the pneumoperitoneum to 3 to 5 mm Hg.

Next, two lateral posterior sutures are placed with the knots tied on the bladder mucosa (Fig. 3). The reinforcement of the posterior aspect of the anastomosis minimizes the likelihood of false catheter passage and creates watertight mucosal apposition. This is confirmed by catheter insertion under direct camera vision. The needle is placed inside-out through the urethra, ready to be run in a continuous fashion. The contralateral needle driver is then used to take full-thickness bites outside-in, entering the bladder neck and exiting the urethra (Fig. 4). Use of the contralateral needle driver creates the proper working angle to facilitate suture placement in a single pass, achieving greater efficiency. Bilaterally, two to three bites are typically required to complete the anastomosis, resulting in both sutures exiting the urethra anteriorly. The longer suture is driven through the anastomosis out the anterior bladder neck and tied. Anastomotic integrity is tested by placing 120 mL of saline into the bladder. The working catheter is exchanged under camera vision for a final 20-French catheter, and return of irrigant confirms proper catheter placement. Postoperatively, we only obtain cystograms in men requiring extensive bladder neck reconstruction with leakage of saline while testing anastomotic integrity or urine leak confirmed by elevated drain creatinine.

Conclusion

The described anastomosis, with experience, takes less than 10 minutes to complete. In over 300 cases, prolonged catheterization of ≥10 days occurred in 2.8% of men due to voiding trial failure or contrast extravasation on cystogram. In 294 men with more than 3 months of follow-up, we have experienced three anastomotic strictures (1%), and early continence, defined as no pad usage or one small liner used for security purposes, is 74% at 3 months and 84% at 6 months. Although knot placement inside the anastomosis is un-
FIG. 1. Suture placed inside-out, right-to-left through urethra without transection.

FIG. 2. Posterior suture placed on bladder mucosa cinched down with “water-ski” traction.

FIG. 3. Completion of left lateral posterior urethra suture with three knots on posterior bladder wall.

FIG. 4. Right-side suture completed in running fashion with contralateral arm.
conventional, we prefer the direct visualization of the knot tension that results from this approach. The knot can be clearly placed on the bladder mucosa allowing buttressing during formation of the posterior sutures, thus reducing the risk of urethral “shredding.” Finally, in rare instances where postoperative cystoscopy was performed to assess obstructive urinary symptoms, we have noted that the suture material dissolves by 6 weeks.

**Recommended Readings**


Address reprint requests to:
Jim C. Hu, M.D., M.P.H.
Division of Urology
Brigham and Women’s Hospital
Dana Faber Cancer Center
Harvard Medical School
Boston, MA 02155

E-mail: jhu@partners.org