Surgical Challenges in Radical Prostatectomy

Robotic Repair of Rectovesical Fistula Resulting From Open Radical Prostatectomy

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OBJECTIVES
Rectovesical fistula (RVF) is a rare complication of radical prostatectomy. A 57-year-old man underwent open radical prostatectomy with recognized rectal injury, primary closure of the rectal wall, and loop colostomy. The patient developed urine leakage per rectum after colostomy closure. We diverted the fecal stream with end colostomy and placed a suprapubic tube. An open transsacral (Kraske) repair failed 1 month later. We have previously described the laparoscopic approach, and report the technique and results of our first robotic assisted operation.

METHODS
The operative steps were as follows: (1) cystoscopy, (2) RVF catheterization (3) five-port transperitoneal laparoscopic initial dissection (4) mobilization of omental pedicle flap, (4) cystotomy extending toward the fistulous tract, (5) robot docking (6) dissection of the rectovesical plane, (7) interrupted rectal closure, (8) omental interposition, (9) bladder closure, and (10) drain placement.

RESULTS
Operative time was 180 minutes. Hospital stay was 1 day. The suprapubic tube was removed at 2 months after normal cystography. Bowel continuity was restored at 4 months, with no fistula recurrence at 1-month follow-up.

CONCLUSIONS
We await longer follow-up and experience in larger series. For now, robotic repair of rectovesical fistula appears feasible and represents an attractive alternative to open and laparoscopic approaches.


Rectourethral fistulae (RUF) are uncommon. Although they may develop in patients with inflammatory bowel disease and perirectal abscesses, they most frequently appear as an iatrogenic complication of extirpative or ablative prostate procedures. The incidence of rectal injuries after radical prostatectomy is 1%-11%.1,2 A review of complications after radical prostatectomy in the Medicare population (n = 25,561) revealed a 1% incidence of RUF.3 With ablative treatments to the prostate, RUF incidence is as follows: 0.4%-8.8% after brachytherapy,1 0%-6% after external beam radiotherapy,4 and 0.4% after cryotherapy.5 Clinical findings suggestive of RUF include pneumaturia, fecaluria, and urine leakage per rectum.6 Imaging and endoscopic studies aid in delineating the fistulous tract. Cystoscopy, cystography, colonoscopy, and barium enema have been used. Cystoscopy has a sensitivity of 80%-100%,7 but combined endoscopic and radiographic evaluation affords the most precise anatomic depiction of the fistula. Distal obstruction (urinary or fecal) is a risk factor for repair failure and must be determined to plan surgical repair effectively.

Regardless of the surgical approach, the best chance of success is the first surgical attempt. The following clear surgical tenets must be satisfied: (1) fecal and urinary diversion, (2) elimination of distal obstruction, (3) debridement to healthy tissue, and (4) tension-free tissue approximation. When possible, and particularly in the setting of poor tissue healing potential (such as radiation or nutritional deficiency), interposition of vascularized tissue (omentum, peritoneum, muscle flaps, and so forth) is advisable.

Several open surgical approaches have been described, including perineal, transanal, abdominal, and combined abdominoperineal. Encouraged by our experience in robotic surgery, and having demonstrated feasibility with the laparoscopic approach,8 we report our initial experience with a robotic assisted approach to rectovesical fistula repair.

PATIENTS AND METHODS
A 57-year-old male with a clinically localized prostate cancer had undergone an open radical prostatectomy for high-risk disease (prostate-specific antigen of 20, Gleason score of 3+4 = 7, pT2N0M0). A rectal injury occurred and was repaired pri-
Results of the laparoscopic assistance were encouraging. At 1 month since restoration of bowel continuity, there has been no fistula recurrence.

**COMMENT**

Rectourethral fistula is a rare but devastating complication that can develop after prostatic ablative or extirpative procedures. Treatment of this entity is challenging. Conservative management consisting of urinary diversion, broad-spectrum antibiotics, and parenteral nutrition is often initially attempted. Success rates as high as 25%-50% have been reported,9,10 but conservative measures often fail. If the fistula remains open in 3-6 months, further healing is unlikely.11-20 More than 40 surgical techniques for the management of RUF have been described and there are no data clearly favoring one approach.7 Transanal, transanorectal, transsphincteric, transabdominal, perineal, and combined approaches are frequently used.

Basic surgical principles include excision and debridement of the fistula tract to healthy vascular tissue, separation of the rectal and bladder suture lines with tissue interposition, and effective urinary and/or fecal diversion.1 Some authors believe that fecal diversion is mandatory; others feel that it is necessary only when there have been previous failed repairs, complex fistulae, pelvic sepsis, or a history of radiotherapy, or in the absence of bowel preparation.2

The laparoscopic approach to RVF repair is modeled directly after open principles, with notable nuances. When RVF fistulae develop after radical prostatectomy, they usually occur along the vesicourethral anastomotic line. In that case, the technique involves an extravesical approach, opening of the bladder toward the fistula tract, dissection between the rectum and bladder, closure of the rectum, interposition of omentum, and closure of the bladder.

Our technique offers the advantages of minimally invasive surgery, with excellent visualization, adequate space for instrument maneuvering, and the availability of omentum, peritoneum, or epiploic appendages for tissue interposition. If needed, a cystostomy, colostomy, or both can be performed simultaneously. The bladder neck is easily accessible with this approach, even with a “deep"
pelvis. However, this technique requires advanced laparoscopic experience.

We have had a 100% success rate after minimally invasive fistula repair, and no complications, but our experience is limited to 5 laparoscopic cases with only 1 year of follow-up. Follow-up for this robotic case is short-term, at 1 month after restoration of bowel continuity, and the patient is without recurrence. At this writing, we have performed one additional case of robotic rectovesical fistula repair. This iatrogenic fistula recurred following open trans-perineal closure, and has remained closed at 1 month following robotic repair. More experience and longer follow-up is required before definitive recommendations can be made for the role of minimally invasive fistula repair in the surgical armamentarium for this entity.

Certainly, our subjective impression is that features of the robot have simplified the robotic approach compared with standard laparoscopy. These include three-dimensional vision, six degrees of freedom with wrested movements, and downscaling of movements (for instance, modulation of the amplitude of surgical motions by up to five times). Mounting experience with deep pelvic robotic surgery, in addition, lay the groundwork for familiarity with maneuvering in tight spaces. Robotics might permit the popularization and careful diffusion of this technique.

CONCLUSIONS

Robotic rectourinary fistula repair is feasible, and represents an attractive alternative for the management of rectourinary fistulae. Longer follow-up and experience with more patients are required before its ultimate role in treating these difficult cases can be defined.

References