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Robotic-assisted laparoscopic segmental resection with rectoanal anastomosis: a new approach for the management of complicated rectourethral fistula

Weill Cornell Medicine is an academic medical center that provides exemplary care for our patients. Our Division of Colon and Rectal Surgery includes the nation's leading surgeons for colon and rectal surgical treatments.

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Dr. Alessio Pigazzi was appointed the chief of Colon and Rectal Surgery at Weill Cornell Medical Center/NewYork-Presbyterian in 2020. His research focuses on minimally invasive techniques to improve recovery after cancer surgery, postoperative chemotherapy and the relationship between diet and colorectal cancer.

In this article, Dr. Pigazzi and his co-authors present a new technique for treating complicated fistulas (abnormal holes in the bowel or bladder), specifically rectourethral fistulas, holes between the urethra and rectum that can cause urine leakage to the rectum and fecal leakage to the urethra.

This technique is called robotic-assisted laparoscopic segmental resection with rectoanal anastomosis. Laparoscopic surgery is a type of surgery that uses thin tubes that are inserted into small incisions (cuts). Robotic-assisted surgery uses robotic technology to perform the operation. Dr. Pigazzi and his co-authors assert that this is a feasible alternative to open surgery or conventional laparoscopic surgery.

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TECHNICAL NOTE

Robotic-assisted laparoscopic segmental resection with rectoanal anastomosis: a new approach for the management of complicated rectourethral fistula

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Abstract Various transanal and perineal surgical techniques have been described for the treatment of rectourethral fistula (RUF). However, these techniques are poorly suited for complicated fistulas. Here, we present a novel minimally invasive procedure: robotic-assisted laparoscopic segmental resection with rectoanal anastomosis for the management of difficult RUFs. This novel technique may be valuable in the treatment of recurrent or complex RUFs.

Keywords Robotic-assisted · Segmental resection · Rectoanal anastomosis · Rectourethral fistula

Introduction

Rectourethral fistulas (RUF) are devastating complications that can develop after prostatic ablative or resective procedures, and other pelvic or perineal operations. The main advantages of the transanal or transperineal approaches such as the York-Mason repair for rectourethral fistula are the limited invasiveness and the lack of significant morbidity. However, these operations rely on tissue present immediately around the fistulas, so they may not be suited for radiation-induced or recurrent fistulas. While abdominal procedures may be indicated for difficult or recurrent fistulas, open dissection of the rectum is associated with substantial morbidity and can be difficult especially when dealing with inflamed or radiated tissue.

Having successfully employed robotic technology in rectal cancer surgery, we have utilized similar robotic techniques for the treatment of RUFs. We present our technique and initial results with a robotic-assisted laparoscopic segmental resection and rectoanal anastomosis for the management of complicated RUFs.

Patients

Patient A (76 years old) developed RUF after radioactive prostatic seed implantation and patient B (66 years old) after robotic-assisted prostatectomy for prostate cancer. A prior York-Mason repair with fecal diversion had been performed and failed in both patients. Both patients were operated by a single surgeon (A.P.) at City of Hope National Medical Center, CA, USA.

Methods and results

The patient was brought into the operating room, anesthetized, and positioned in the prone jackknife position. The perineal area was draped in a sterile fashion. A Lone-Star (TM) retractor (Lone Star Retractor System, Cooper Surgical) was used to dilate the anus. We began a transanal dissection, starting about 1 cm distal to the level of the fistula in the intersphincteric plane. After adequate dissection and debridement around the opening of the fistula, the urethral opening was approximated with 4/0 vicryl interrupted sutures. A sponge was packed around the dissected area.

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The patient was repositioned in the lithotomy position for the laparoscopic and robotic part of the procedure. After sterile draping, pneumoperitoneum was obtained using a Veress (TM) needle. A total of six ports were placed under vision. Using a laparoscopic medial-to-lateral approach, the descending and sigmoid colon were mobilized. The inferior mesenteric vein and superior rectal artery were identified, skeletonized and divided between Hem-o-lok clips (Weck Teleflex Medical), after identifying and preserving the left ureter and gonadal vessels. Then, the entire descending and sigmoid colon were medialized above Toldt's fascia.

At this point, the four-arm Da Vinci® robotic system was brought onto the field and docked over the left hip. Total mesorectal dissection and autonomic nerve preservation was carried out first posteriorly, then laterally, and finally anteriorly. The dissection of the rectum was continued all the way down until the transanal intersphincteric plane was met, freeing the distal rectum from its attachments around the anal hiatus. The port sites were closed.

The patient was repositioned in the prone jackknife position. The perineal area was draped in a sterile fashion. A wound protector was introduced through the anus. The specimen was extracted through the anus, followed by segmental resection of the diseased rectum and a hand-sewn rectoanal anastomosis (Figs. 1, 2). A Penrose drain was left in between the anastomotic sutures draining the pelvic cavity. Both patients already had an ostomy in place and this was kept for diversion.

The operative times were 210 and 192 min, respectively. Estimated blood loss was minimal. Patients were discharged on 3rd and 4th postoperative day, respectively. A small pelvic abscess developed in patient A, but it was treated with transanal drainage and resolved within 3 weeks. Diverting stomas of the patients were taken down on in postoperative weeks 8 and 6, respectively. Both patients were seen in the outpatient clinic 2 weeks postoperatively and then at approximately 4 months after stoma closure. Patient B is fully continent and patient A is occasionally incontinent to liquids. Both patients are free of recurrent fistula during a follow-up of 30 and 16 months, respectively. Both patients have an average of two bowel movements per day.

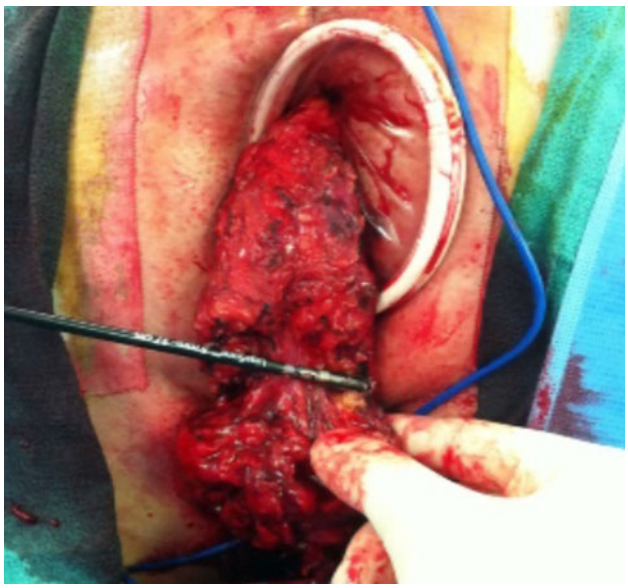

Fig. 1 Segmental resection of the rectum, containing the rectourethral fistula

Fig. 2 Healthy rectum for rectoanal anastomosis

Discussion

Patients with RUFs and a history of pelvic irradiation or failed prior repair may require closure with a well-vascularized, healthy tissue flap. Although gracilis muscle interposition has a reported success rate of 78–92 % [1, 2], the very low number of cases with a history of pelvic irradiation and failed prior procedure make it difficult to compare this approach with other methods. Rectal sleeve advancement has also been performed by a transanal approach or an abdominal approach for rectovaginal fistula [3]. However, adequate sleeve advancement with a non-irradiated rectum is often difficult via the transanal approach, and the procedure is a maximally invasive one with open abdominal surgery [2, 4].

Laparoscopic primary repair of rectovesical fistula and extraperitoneal laparoscopic repair of rectourethral fistula have been reported [5–7], but these approaches may be not

suitable for patients with complicated RUF who have failed prior repair and have received radiotherapy. Neither a laparoscopic nor a robotic rectal advancement has been described for the repair of RUF. We have chosen the robotic approach because laparoscopic techniques have certain ergonomic and technical constraints that can limit adequate and safe dissection of the rectum and fistula tract from the inflammatory adhesion to surrounding tissue. Furthermore, this procedure has the advantage of maximizing fresh tissue interposition without sacrificing the rectum in its entirety. Our experience is limited to two cases with a short follow-up period. More experience and longer follow-up is required before definitive recommendations can be made for the role of robotics for RUF repair. Nonetheless, thanks to the advantages in terms of visualization, precision, and ergonomics compared with conventional laparoscopy, we feel that robotic-assisted laparoscopic segmental resection with rectoanal anastomosis for the management of complicated RUF is a feasible alternative to open and conventional laparoscopic repair.

Conflict of interest The authors declare that they have no conflict of interest.

References

1. Samplaski MK, Wood HM, Lane BR, Remzi FH, Lucas A, Angermeier KW (2011) Functional and quality-of-life outcomes in patients undergoing transperineal repair with gracilis muscle interposition for complex rectourethral fistula. Urology 77:736–741
2. Wexner SD, Ruiz DE, Genua J, Nogueras JJ, Weiss EG, Zmora O (2008) Gracilis muscle interposition for the treatment of rectourethral, rectovaginal, and pouch-vaginal fistulas: results in 53 patients. Ann Surg 248:39–43
3. Schouten WR, Oom DM (2009) Rectal sleeve advancement for the treatment of persistent rectovaginal fistulas. Tech Coloproctol 13:289–294
4. Shin PR, Foley E, Steers WD (2000) Surgical management of rectourinary fistulae. J Am Coll Surg 191:547–553
5. Sotelo R, Mirandolino M, Trujillo G et al (2007) Laparoscopic repair of rectourethral fistulas after prostate surgery. Urology 70:515–518
6. Sotelo R, Garcia A, Yaime H et al (2005) Laparoscopic rectovesical fistula repair. J Endourol 19:603–607
7. Sotelo R, de Andrade R, Carmona O et al (2008) Robotic repair of rectovesical fistula resulting from open radical prostatectomy. Urology 72:1344–1346