CASE REPORT

Vesicovaginal Fistula Repair Without Intentional Cystotomy Using the Laparoscopic Robotic Approach: a Case Report

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ABSTRACT

Background and Objectives: Fistulas inaccessible from the vagina may require abdominal repair; we sought to evaluate the robotic-assisted laparoscopic approach for this procedure.

Methods: A 41-year-old nulliparous woman presented with urinary incontinence following an abdominal hysterectomy, and office evaluation identified a vesicovaginal fistula. After discussion with the patient regarding the surgical options, the robotic approach was chosen to facilitate precise dissection, fine visualization, and suturing. A stent was placed from the bladder into the vagina, and no intentional cystotomy was made. The bladder was dissected away from the anterior vaginal wall at the fistula site, and the defects were closed independently with interposition of a fatty epiploica from the sigmoid colon. Total operative time was approximately 4 hours, and robotic time was about 2.5 hours.

Results: At 3 months after surgery, the patient had no recurrent symptoms.

Conclusions: The robotic-assisted laparoscopic approach is a viable option for successful repair of a vesicovaginal fistula in a patient in whom a vaginal approach is not indicated.

Key Words: Robotic surgery, Vesicovaginal fistula, Laparoscopic surgery, Urinary incontinence.

INTRODUCTION

Most vesicovaginal fistulas in the United States today are the result of abdominal gynecologic surgery and may not have been detected or predictable based on the original surgery.[1] Patients typically complain of incontinence of urine, particularly upon standing.[1] After confirming the absence of urinary tract infection, a careful speculum examination should be done to look for vaginal mucosa defects. Additionally, use of medication to dye the urine while a tampon is in the vagina may confirm the presence of a connection. Cystourethroscopy is indicated to identify and describe the fistula.[1] With that information, imaging should be used to investigate for involvement of the upper urinary tract.[1]

If conservative options fail and after allowing postoperative inflammation to subside, traditional surgical options have included vaginal repair, usually using the Latzko technique, or an abdominal incision for open repair.[1] Patients are typically offered an abdominal repair if the defect is large, multiple, involves other pelvic structures including the ureters, or if there is poor descent of the vaginal cuff causing the defect to be inadequately visualized from a vaginal approach. Success with a similar technique using laparoscopy has also been described.[2–4] Prior reports, however, have often included the use of an intentional cystotomy to facilitate dissection.[2–6]

Because of the morbidity and recovery required for an abdominal incision, we sought to evaluate the role of the da Vinci robotic system (Intuitive Surgical, Sunnyvale, CA, USA) to facilitate repair of a vesicovaginal fistula.

CASE REPORT

A 41-year-old, nulliparous woman presented with urinary incontinence after an emergent total abdominal hysterectomy with bilateral salpingectomy. The hysterectomy was performed for bleeding following a hysteroscopy performed for fibroids. Bilateral hydrosalpinges were noted at the time of laparotomy. There was no difficulty with dissection of the bladder or cystotomy noted at the time of the procedure. A phenazopyridine tampon test in the office 2 weeks after the surgery confirmed a connection

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Dr Wagner receives teaching honoraria from Intuitive Surgical. None of the other authors has any financial interests relevant to this report. This is an unfunded case report. Institutional Review Board approval is not required for single-patient case reports at our institution. This patient signed a consent form regarding the making of a surgical video.

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from the bladder to the vagina. Medical and surgical histories were otherwise unremarkable.

Speculum examination failed to identify the fistula, and office cystoscopy was performed. A 1 cm opening was identified on the base of the bladder above the trigone to the right of the midline and 2 cm posterior to the interureteric ridge. The ureteral orifices did not appear to be compromised by the fistula and outflow was seen from both.

The patient declined prolonged drainage with a catheter after counseling that this might promote healing. Given the difficulty in visualizing the lesion and the lack of cuff descent in this nulliparous woman, an abdominal rather than vaginal approach for repair was recommended. After discussion with the patient regarding the risks and benefits of an open abdominal procedure, a laparoscopic repair, or a robotic approach, the patient chose the robotic surgery. The similarities and differences between the 3 procedures were discussed with the patient, along with the attending surgeon's experience with robotic surgery, which spans 4 years. The patient was aware that the surgery could be converted to laparoscopy or an open procedure should there be any difficulty with the robotic approach. The surgery was scheduled approximately 3 months after the hysterectomy had been performed.

In the operating room, the patient was positioned in the dorsal lithotomy position similar to that used in standard laparoscopy. Both arms were carefully tucked using padding at the patient's side. Prophylactic doses of cefazolin and heparin were given before the beginning of surgery. On cystoscopy, the fistula was noted, and a 5-French Pollack stent was placed from the bladder through the fistulous tract into the vagina. Double J ureteral stents were placed over guide wires, given the close proximity of the ureteral orifices to the fistula and repair.

The Hasson technique was chosen for umbilical port access due to the patient's previous surgery. A steep Trendelenburg positioning was used. The camera was placed through a 12 mm port located superior to the umbilicus and approximately 18 cm superior to the symphysis pubis. Twelve mm and 5 mm assistant ports were placed on the right side, and 8 mm robotic trocars were inserted on the lateral edge of the rectus muscles bilaterally **(Figure 1)**. The da Vinci robot was positioned. Lysis of omental and small bowel adhesions in the area of the previous incision was performed using hook cautery and the 30-degree "up" lens.

The vaginal cuff was identified by a sponge stick in the vagina and dissection proceeded along the anterior vaginal wall. The bladder was dissected away from the anterior vaginal wall by using hook cautery and the 0-degree lens for the robotic camera. Gentle traction on the stent was used to identify the site of the fistula. No cystotomy was made. Sharp dissection was used to mobilize the tissue around the fistulous tract. Fluid containing indigo carmine was instilled into the bladder and was seen coming from the fistula site.

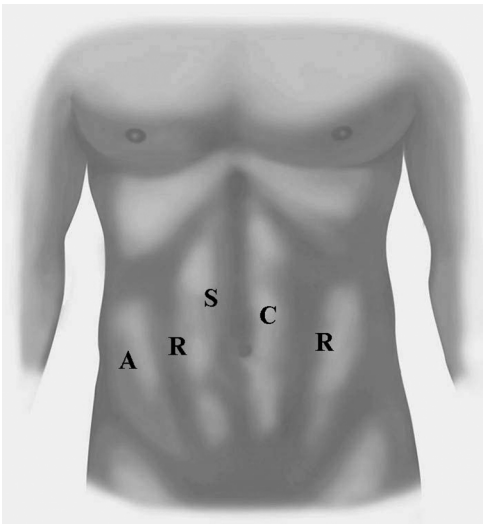

Figure 1. Port placement for robotic-assisted vesicovaginal fistula repair: C = 12 mm camera port; R = 8 mm robotic ports located on lateral edge of rectus muscles; S = 5 mm suction port; A = 12 mm assistant port located superior and medial to anterior superior iliac spine.

The bladder was repaired by using a running stitch of 3–0 Vicryl on an RB needle using the da Vinci robot. Knots were tied intracorporeally. A second layer of closure was performed in an imbricating fashion with the same suture. The vagina was closed using a running stitch of 2–0 monocryl on an SH needle. The ureteral stents were removed without difficulty, and backfill of the bladder again using indigo carmine failed to reveal any interruption of bladder integrity. A fatty epiploica from the sigmoid colon was interposed between the vagina and bladder repair sites. This was done using 2 stitches of 3–0 Vicryl. A Jackson-Pratt drain was placed in the pelvis.

The da Vinci robot was disconnected and the port sites were closed. Estimated blood loss for the case was minimal. Time for the robotic portion of the procedure was approximately 2.5 hours. Total operative time, including patient positioning, cystoscopy for ureteral stents, and fistula identification, was approximately 4.5 hours.

The patient was continued on intravenous cefazolin postoperatively for prophylaxis. She was discharged home on postoperative day #1. She returned for a follow-up 3 weeks after surgery and reported no continuing symptoms of urinary incontinence. Cystogram at that time confirmed successful repair. She continues to do well 3 months postoperatively.

CONCLUSION

As in this patient, abdominal hysterectomy is the most common cause of vesicovaginal fistula in developed countries, while obstetric causes are much less common.[1] Although conservative management is successful in some patients, and others are candidates for vaginal repair, some patients may not be candidates or may be unsatisfied with these options.

The laparoscopic approach is a viable option for successful repair of a vesicovaginal fistula in a patient in whom a vaginal approach is not indicated. As with other laparoscopic surgeries, this provides superior magnification of tissue, visualization of any additional pathology, and requires no large abdominal incision.[5] Additionally, laparoscopic and robotic surgery may result in a shorter hospital length of stay and improved cosmesis as compared with open abdominal surgery. However, this may be an obstacle to surgeons without laparoscopic suturing or advanced dissecting skills.

The da Vinci robotic tower includes 1 camera arm and 2 to 3 instrument arms that are controlled remotely by the surgeon sitting at a nonsterile console. Once a surgeon is trained to use the robotic-assisted approach, the da Vinci robot can be used to facilitate the laparoscopic repair. Its advantages include improved dexterity with increased degrees of freedom giving the surgeon the sensation of having wrists rather than lever arms, enhanced magnification, 3-dimensional visualization providing depth perception similar to that of open surgery, increased surgeon comfort with a seat and decreased surgeon hand fatigue compared with traditional operative laparoscopy.[5,6]

A successful robotic-assisted technique has been described.[5,6] In both of these previous reports of this surgical technique, intentional cystotomies were made in a healthy area of the posterior wall of the bladder to facilitate identification and repair. A stent placed cystoscopically from the bladder into the vagina, as explained here, may obviate the need to make an intentional cystotomy. This may decrease the risk of recurrence and length of postoperative catheterization.

Because robotic surgery is relatively new to gynecology, its ultimate role is still evolving. Procedures that involve a high degree of precision and technical skill like suturing appear to be the first areas of application of this technology, given the advantages of robotic surgery over traditional laparoscopy. Robotic techniques for myomectomy, sacrocolpopexy, and hysterectomy have also been reported.[7] Given the extent of gynecologic surgery that is performed laparoscopically at this point, it is reasonable to believe that robotic surgery could have an expanding list of uses. As the case volume grows, additional studies should be carried out to assess the benefits of robotic assistance over traditional laparoscopy or other surgical approaches.

Although the vaginal approach is the most common for repair of vesicovaginal fistulas,[1] the robotic-assisted laparoscopic approach can also be a successful option in patients for whom the vaginal approach is not possible.

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