Aegean Journal of Obstetrics and Gynecology 4/2

Aegean Journal of Obstetrics and Gynecology

Case Report

Supervene of vesicovaginal fistula after open total hysterectomy with concurrently bladder repair in an outer unit: successful surgical management with robotic surgery

Ozgen Nahya Ozdogar [a, †], Orcun Celik [b], İbrahim Egemen Ertas [a]

[a] Department of Obstetrics and Gynecology, Tepecik Training and Research Hospital, Izmir, Turkey

[b] Department of Urology, Tepecik Training and Research Hospital, Izmir, Turkey

ABSTRACT

Objective: While vesicovaginal fistula (VVF) is not common in developed countries, it is a significant health problem in developing countries. These fistulas are usually unfortunate complications of gynecologic or other pelvic surgery and radiotherapy in developed nations. Once a vesicovaginal fistula is suspected, a meticulous vaginal examination should be performed to identify its size, location, and relation to the trigone. Even though there is no consensus on which approaches are better, surgical and conservative are the two options. In terms of the surgical option, there are numerous approaches such as abdominal, vaginal, and minimally invasive surgery (i.e., laparoscopic and robotic). The treatment algorithm depends on surgeons' training, experience, facilities, and also cause, size and anatomical localization of VVF.

Case Report: A 44-year-old woman was entered into the external center complaining of abnormal uterine bleeding. This hospital recommended total abdominal hysterectomy and bilateral salpingo-oophorectomy with Pfannenstiel incision. A bladder injury occurred during the operation and was repaired by a urologist. After one month of the operation, the patient had vaginal leakage during urination and vaginal wetness during exertion. VVF was diagnosed at the gynecologic examination. After conservative treatment, she was referred to our tertiary care department. In collaboration with the urology department, we decided to apply robotic surgery. She had no complaints at four months of clinical follow-up postoperatively.

Conclusion: As is known, minimally invasive surgery provides low morbidity and a higher success rate. Therefore, patients with VVF should be referred to tertiary care centers, and the treatment process and management should be determined with a multidisciplinary team, including urology, radiology, interval radiology, and urogynecology.

Keywords: vesicovaginal fistula; hysterectomy; minimally invasive surgery

ARTICLE INFO

Doi: 10.46328/aejog.v4i2.105

Article history:

Received: 18 October 2021

Revision received 11 December 2021

Accepted 02 January 2022

Introduction

Vesicovaginal fistula (VVF) is a condition arising from abnormal communication between the bladder and vagina, and it causes continuous urine leakage to come out of the vagina. In the literature, the most reported cause of this condition is obstetric and gynecological injuries [1]. Although VVF is less common in developed countries, the most common causes are gynecological operations, radiotherapy, and malignant diseases. However, obstructed labor and consequent pressure necrosis are the most common causes of vesicovaginal fistulas in developing countries [2]. Recent epidemiological studies reported that the range of the incidence of suffering from VVF varies between 0.3% and 2.0% [3]. The following conditions are notified as to the reasons for VVF incidence: poor socioeconomic status, early marriage, malnourishment, low literacy rate, and the poor healthcare system [4]. VVF diagnosis is based on clinical evaluation and methylene blue dye testing. Also, utilizing transvaginal ultrasonography could give more information about the location and size of the fistula [4]. Even though there is no consensus in terms of VVF management, there are two options; surgical and conservative. In terms of the surgical option, there are numerous approaches such as abdominal, laparoscopic, direct vaginal repair, and robotic [5]. Choosing the best approach depends on the size and the anatomic location of VVF, time of diagnosis, cause of VVF, and surgeons' experience.

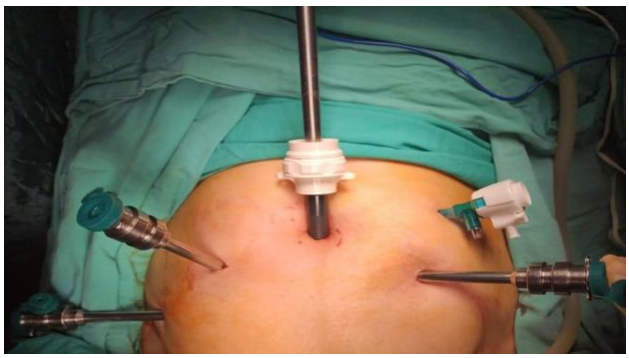
Case Report

44-year-old woman had three vaginal deliveries. She has no history of abdominal operation or chronic disease. She was entered into the external center with the complaint of abnormal uterine bleeding. This hospital recommended total abdominal hysterectomy and bilateral salpingo-oophorectomy with Pfannenstiel incision. Bladder injury occurred during the operation and was repaired by a urologist. After one month of the operation, a methylene blue test was performed because the patient had vaginal leakage during urination and vaginal wetness during exertion. Methylene blue test was positive, and VVF was diagnosed at the gynecologic examination. They had recommended three months of conservative treatment with a foley catheter. At the end of three months, the patient's complaints continued even after conservative treatment, so she was referred to our tertiary care department. During our exam, urine leakage to the apical part of the vagina and a 6 mm hyperemic fistula orifice in the apex was observed. Also, grade 1-2 right hydroureter was seen during ultrasonographic evaluation. In collaboration with the urology department, we decided to apply the robotic approach due to the apical position of the large fistula orifice and the patient's having bladder repair history during the previous surgery. Firstly, we performed cystoscopy and also catheterization of the fistula tract and left ureter. The right ureter orifice was retracted medially due to the fibrotic tissue which arose from bladder repair during the first operation, so the right side catheter was carried forward only three centimeters.

† Corresponding author.
E-mail: nahyaozgen@gmail.com
Orcid Id; 0000-0002-7220-1595

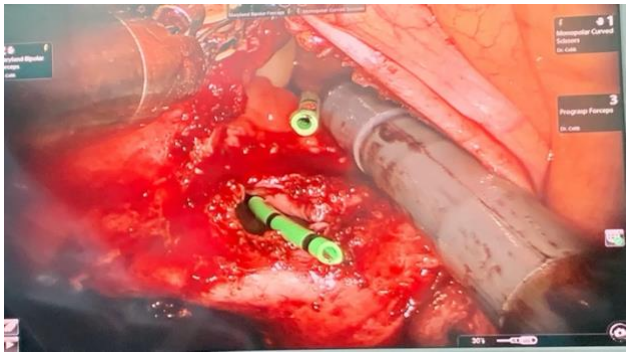
Subsequently, the operation was performed under a robotic-assisted laparoscopic approach with one 12 mm robotic camera port, three 8 mm robotic ports, and one 11 mm assistant port (figure 1).

Figure 1: Port placements of robotic VVF repair surgery



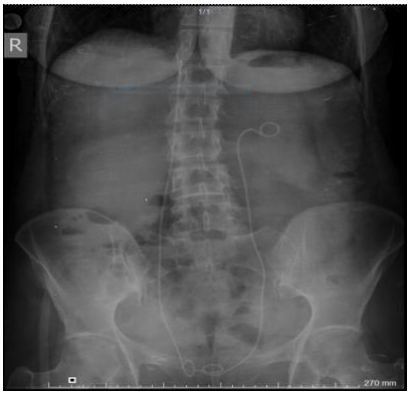
We have performed the operation with the following steps; (i) extensive adhesiolysis was performed, including the abdominal and pelvic peritoneum (ii) careful vesical and vaginal cuff dissection was accomplished (figure 2) (iii) the bladder and the apex of the cuff was opened for preparation toward the fistula, the fistula was resected completely including perifistular scar, and inflamed tissue (iv) right ureteroneocystostomy with boari flap was performed in combination with inserting bilateral double J stent (DJS) (v) the vaginal cuff and bladder were closed with 3-0 V-Loc in two layers (vi) omental tissue was used to cover between the bladder and vaginal cuff (vii) a drain was placed in the posterior cul de sac (viii) all the ports were removed.

Figure 2: Robotic surgical view of fistula orifices with catheters after vesical and vaginal cuff dissection



On the first postoperative day, 300 ccs of fluid drainage were observed in the drain. On the second postoperative day, 1000 cc fluid drainage was observed in the drain. Biochemical analysis was performed from the sample taken from the drain. The Urea/creatinine ratio was found as 470/28.5 mg/dl, suggesting that there was a urine leakage to the abdomen. We analyzed the patient together with the urology department, and the patient underwent an abdominal x-ray and a computerized tomography to see the localization of the DJS. We observed that the right DJS was placed wrongly during the operation, and it was seen dislocated (figure 3). Rapidly, the right DJS was removed under spinal anesthesia. Next, a percutaneous nephrostomy catheter was located to the right kidney, and antegrade DJS was inserted to the right ureter by an interventional radiologist. The nephrostomy catheter was removed after two days. The drain was removed on the postoperative 7th day and the patient was discharged with an 18F foley catheter on condition to control after four weeks. In addition, 400 mg cefixime, 4 mg fesoterodine (an anti-muscarinic drug), and 10 mcg vaginal estradiol hemihydrate were administered one's daily, and we prohibited sexual intercourse for 8 weeks.

Figure 3: CT pyelogram demonstrating the dislocation of right DJS



After four weeks of surgery, she returned for a follow-up and reported no continuing symptoms of vaginal urinary leakage, and vaginal wetness. No leakage was observed during the cystogram then the foley catheter and bilateral DJS were removed. She had no complaints at four months of clinical follow-up postoperatively.

Discussion

Vesicovaginal fistula is a condition that has devastating consequences, which affects the quality of life, arise from gynecological operations, radiotherapy, and malignant diseases in developed countries; while obstructed labor and consequent pressure necrosis are the most common causes of vesicovaginal fistulas in developing countries [4]. Xiong et al. [6] demonstrated that the vaginal cuff in the supratrigonal posterior wall of the bladder is the region where the VVF is most located. Although the approximate incidence of VVF reported ranges between 0.3% and 2.0%, the exact numbers are still unknown because of the stigma effect [4, 7]. In this line, we should consider that VFF affects not only physical health but also psychological health. Therefore, finding the best way to manage this condition is crucial for patients' quality of life.

Surgical and conservative methods are the options of treatment. The conservative option includes continuous bladder drainage, fulguration of the fistula tract, fibrin glue injection, platelet-rich plasma injection, bilateral percutaneous nephrostomies, and ureteric occlusion. In terms of the surgical option, there are numerous approaches such as abdominal, laparoscopic, direct vaginal repair, and robotic [3]. Choosing the best approach depends on the size and the place of VVF, time of diagnosis, cause of VVF, and surgeons' experience [8]. In this case report, we performed a robotic approach three months after the diagnosis of VFF occurring after total abdominal hysterectomy with concurrent bladder repair. The ideal timing for surgery is still a controversial issue to repair in VFF. There are two different suggestions; the first is as soon as possible from the diagnosis; the other option depends on after occurring tissue necrosis or infection, edema, and inflammation [9]. Most experts consider this period up to 12 weeks [10]. Similarly, the outer unit where the first surgery was performed had recommended three months conservative treatment with a foley catheter. However, due to the continuation of the patient's complaints, she was referred to our department. After gynecologic examination and clinical tests, both the urogynecology and urology departments decided to perform the surgical procedure.

Choosing the surgical procedure is the crucial component of the treatment. Knowing indications and complications of the procedures could assist in the selection process. The abdominal procedure has the following risks; the greater volume of blood loss, prolonged operating duration and discharge, overactive bladder syndrome, nerve denervation [11].

Also, most reported complications related to vaginal repair performed in high apical VVF cases are higher failure rate and urodynamic stress incontinence [11]. To avoid this kind of complications, minimally invasive surgery, which are laparoscopic and robotic approaches, has been popularized over the years. With the viability and usability of the robotic approach from 2005, intracorporeal sutures became better and more effective, resulting in less pain and blood loss, leading to faster recovery and shorter hospital stays [12]. Also, the overall success rates of abdominal, vaginal, laparoscopic, and robotic VVF repair were reported at 86%, 91%, between 80% to 100%, near 100% [13, 14]. Therefore, considering the complications of traditional approaches, rate of success, high apical location of the VVF and the patients' recovery process, our multidisciplinary team decided to perform a robotic surgical procedure.

Lo et al. [11] investigated 12 women who underwent surgical procedures due to VVF. They reported that 8 procedures were performed through the vaginal route, and 4 performed through the abdominal route. Moreover, participants who underwent abdominal procedures had more extended hospital stays than participants those vaginal procedures (8.7±1.8 and 5.4±1.6, respectively). Ghosh et al. [15] demonstrated that participants who underwent laparoscopic procedures had shorter hospital stays than participants who underwent an open surgical procedure (4±0.57 and 13±1.04, respectively). In our case, she was discharged the seventh day after the operation. When comparing the literature, this duration was shorter according to traditional methods, while more extended than the laparoscopic method. The dislocated right DJS could explain the extended hospital stay. We speculated that the hospital stay duration could be shorter if this situation had not happened.

Although the optimal timing of removing the foley catheter is still unclear, the minimum and maximum duration are reported as 10 days and 57 days in recent studies [11]. Prolonged catheterization could lead to the develop urinary tract infections [11]. Furthermore, Breen et al. [9] claimed that a foley catheter must be placed for at least 2–3 weeks from the procedure to ensure wound healing. We scheduled an appointment four weeks away from the operation to remove the foley catheter in company after demonstrating a normal cystography at four weeks postoperatively.

In summary, VVF is a rare condition raised from pelvic surgery, especially total hysterectomy. The treatment algorithm depends on surgeons' training, experience, facilities, and also, cause, size, and anatomical localization of VVF. As is known, minimally invasive surgery provides low morbidity and a higher success rate.

Therefore, patients with VVF should be referred to tertiary care centers, and the treatment process and management should be determined with a multidisciplinary team, including urology, radiology, interval radiology, and urogynecology.

Disclosure

Authors have no potential conflicts of interest to disclose.

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