

Repair of vesicovaginal fistula with transvaginal and abdominal technique: Pamukkale University Urology Clinic's results

Vezikovajinal fistülün transvajinal ve abdominal teknik ile onarımı: Pamukkale Üniversitesi Üroloji Kliniği sonuçları

Kürşat Küçükler, Alper Şimşek, Mesut Berkan Duran, Salih Bütün, Sinan Çelen, Yusuf Özlülerden

Posted date:22.12.2023

Acceptance date:20.02.2024

Abstract

Purpose: Vesicovaginal fistula (VVF) is a pathological condition that causes urinary incontinence from a tract between the bladder and the vagina, negatively affecting the quality of life, social life, and patient health. The preferred method for VVF repair depends on the patient's characteristics, the features of the fistula, and the surgeon's experience. There is no definitive guideline for choosing between vaginal and abdominal VVF repair. This study aims to retrospectively evaluate VVF cases operated on in our clinic, comparing and interpreting patient characteristics and outcomes with the literature.

Materials and methods: The data of 35 patients who underwent vaginal and abdominal VVF repair in our clinic were evaluated retrospectively.

Results: Transvaginal repair was preferred in 23 (65.7%) of the patients and abdominal repair was preferred in 12 (34.3%). The success rate of VVF surgery performed in our clinic was determined to be 88.6%. Success rates were similar; 91.4% in vaginal repair and 83.4% in abdominal repair. Recurrence was observed in 2 of 23 patients (8.6%) who underwent transvaginal repair and in 2 of 12 patients (16.6%) who underwent abdominal repair.

Conclusion: In vesicovaginal fistula surgery, patient characteristics and fistula characteristics guide the preferred surgery. However, the surgeon's experience also plays a big role. Vaginal and abdominal VVF surgeries are performed with similar high success rates.

Keywords: Vesicovaginal fistula, vaginal vesicovaginal fistula repair, abdominal vesicovaginal fistula repair.

Kucuker K, Simsek A, Duran MB, Butun S, Celen S, Ozlulerden Y. Repair of vesicovaginal fistula with transvaginal and abdominal technique: Pamukkale University Urology Clinic's results. Pam Med J 2024;17:381-387.

Öz

Amaç: Vezikovajinal fistül (VVF), mesane ve vajina arasındaki bir traktan idrar kaçırmaya sebep olan, yaşam kalitesini, sosyal hayatı ve hasta sağlığını olumsuz etkileyen patolojik bir durumdur. VVF onarımında tercih edilen yöntem hastanın, fistülün özelliklerine göre ve cerrahın deneyimine göre yapılmaktadır. Vajinal ve abdominal VVF onarımı tercihinde kesinleşmiş kılavuz bilgileri bulunmamaktadır. Bu çalışmada, kliniğimizde opere edilen VVF vakaları retrospektif olarak değerlendirilerek hasta özelliklerinin ve sonuçlarının literatür ile karşılaştırılarak yorumlanması amaçlanmaktadır.

Gereç ve yöntem: Bu çalışmada kliniğimizde vajinal ve abdominal VVF onarımı yapılan 35 hastanın verileri retrospektif olarak değerlendirildi.

Bulgular: Hastaların 12'sinde (%34,3) abdominal yöntem tercih edilirken 23 (%65,7) hastada transvajinal yöntem tercih edildi. Kliniğimizde uygulanan VVF cerrahisinin başarı oranı %88,6 olarak tespit edilmiştir. Vajinal onarımda %91,4, abdominal onarımda ise %83,4 olarak birbirine yakın başarı oranları görüldü. Transvajinal teknik tercih edilen 23 hastanın 2'sinde (%8,6) ve abdominal teknik tercih edilen 12 hastanın ise 2'sinde (%16,6) nüks izlendi.

Sonuç: Vezikovajinal fistül cerrahisinde hastanın ve fistülün özellikleri tercih edilecek cerrahiye yön gösterse de özellikle cerrahın deneyimi büyük rol oynamaktadır. Vajinal ve abdominal VVF cerrahisi birbirine benzer ve yüksek başarı oranları ile uygulanmaktadır.

Kürşat Küçükler, Pamukkale University Hospital, Department of Urology, Denizli, Türkiye, e-mail: kursat_kucuker@hotmail.com (<https://orcid.org/0000-0002-5558-327X>)

Alper Şimşek, Siverek State Hospital, Department of Urology, Sanliurfa, Türkiye, e-mail: drsimsekcalper@gmail.com (<https://orcid.org/0000-0002-0513-4505>) (Corresponding Author)

Mesut Berkan Duran, Pamukkale University Hospital, Department of Urology, Denizli, Türkiye, e-mail: drberkanduran@gmail.com (<https://orcid.org/0000-0002-8597-2081>)

Salih Bütün, Pamukkale University Hospital, Department of Urology, Denizli, Türkiye, e-mail: salihbutun92@gmail.com (<https://orcid.org/0000-0002-5969-0371>)

Sinan Çelen, Pamukkale University Hospital, Department of Urology, Denizli, Türkiye, e-mail: sinancelen@hotmail.com (<https://orcid.org/0000-0003-4309-2323>)

Yusuf Özlülerden, Pamukkale University Hospital, Department of Urology, Denizli, Türkiye, e-mail: yusufozlu35@hotmail.com (<https://orcid.org/0000-0002-6467-0930>)

Anahtar kelimeler: Vezikovajinal fistül, vajinal vezikovajinal fistül onarımı, abdominal vezikovajinal fistül onarımı.

Küçükler K, Şimşek A, Duran MB, Bütün S, Çelen S, Özlülerden Y. Vezikovajinal fistülün transvajinal ve abdominal teknik ile onarımı: Pamukkale Üniversitesi Üroloji Kliniği sonuçları. Pam Tıp Derg 2024;17:381-387.

Introduction

Vesicovaginal fistula (VVF) is a pathological condition that causes urinary incontinence from a tract between the bladder and the vagina, negatively affecting the quality of life, social life and patient health [1]. Common causes in developed countries include bladder injury during gynecological pelvic surgery and pelvic radiotherapy. In developing countries, the most common cause is vaginal birth [2]. Vaginal necrosis and bladder necrosis, especially during difficult labor due to cephalopelvic discordance, increase the frequency of VVF [2]. The incidence of VVF in the population can reach 2% [3]. Although there may be variations depending on the hysterectomy technique, it has been generally demonstrated that VVF associated with hysterectomy occurs in the range of 0.02% to 0.22% [1, 4].

Vesicovaginal fistulas can be classified in various ways. Generally, small fistulas (≤ 0.5 cm), without exposure to radiation and occurring in isolation, are termed simple fistulas. On the other hand, large-sized fistulas (≥ 2.5 cm), with radiation exposure and unsuccessful fistula repairs, are defined as complex fistulas. Fistulas developed after radiation exposure are often multiple and challenging to treat due to poor tissue viability. Medium-sized fistulas (between 0.5 and 2.5 cm) are commonly considered complex fistulas by most authors [5]. Surgical inflammatory reaction reduction in the fistula area is necessary for vesicovaginal fistula operation, and therefore, the operation is planned 3-6 months after the onset of symptoms [6]. During this period, the patient is catheterized, and a decrease in postoperative inflammation and edema is anticipated. This conservative approach may result in spontaneous recovery in about 15-20% of cases with simple fistulas [5].

Small and uncomplicated cases can be attempted to be treated conservatively and with minimal invasive methods, but surgical treatment is the primary method of repair [7]. Factors such as the location and size of the fistula, previous surgeries, history of VVF operations, the need

for simultaneous abdominal surgery, history of radiotherapy, patient preference, and the surgeon's experience are considered in the selection of the surgical technique [5]. There are both transvaginal and abdominal repair techniques available for VVF surgery. However, due to lower operative complications, shorter hospital stays, less blood loss, and lower postoperative pain, and additionally similar success rates with abdominal VVF repair, the vaginal approach is more commonly preferred [8]. The abdominal technique is chosen when vaginal repair is not possible. When success rates are generally examined, the transvaginal technique varies between 86-91%, and the abdominal technique ranges from 84-100% [3]. There are limited randomized controlled studies in the literature comparing abdominal and vaginal approaches [3].

In this study, a retrospective evaluation of VVF cases operated on in our clinic is conducted. The aim is to compare and assess patient characteristics and outcomes with the existing literature and interpret the success of the current practices in our clinic.

Material and method

In the study, 35 patients who underwent VVF surgery in our clinic between January 1, 2012 and November 1, 2022 were evaluated retrospectively. During the postoperative period, patients were monitored for sexual function, urinary function, complications, and recurrence. For the purposes of this study, women with recto-vaginal fistula or other causes of urinary incontinence were excluded. Permission was obtained from Pamukkale University Non-Interventional Clinical Research Ethics Committee for the study.

As a transvaginal technique, the optically guided transvaginal repair method applied in our clinic was used [9]. The patients underwent a cystoscopy before fistula repair. Retrograde pyelography (RGP) was conducted on both ureters to rule out ureteral injury. A thin Foley catheter was inserted into the fistula to provide

traction. After fistula catheterization, surgical dissection and suturing techniques were performed under 5 mm, 30 degree optical lens vision. The fistula was released from the surrounding tissues to the healthy tissues, and first the bladder mucosa, then the layers containing the detrusor and serosa were closed separately in two layers. After that, the fistula was repaired in 3 layers in total, with the vagina perpendicular to this line. The urethral foley was removed 14 days later.

Before the repair with the abdominal technique, a cystoscopy was performed on the patients and fistula characteristics were determined. RGP was performed on both ureters, ureteral damage was evaluated, and a ureteral catheter was placed in the ureters in the necessary patients, depending on the location of the fistula. After the subumbilical incision, the peritoneum was opened and the bladder was found. The bladder was opened with a vertical incision. The fistula tract was reached by visualizing the fistula mouth. The bladder and vaginal wall were dissected with

sharp dissections. The vaginal opening was sutured. Fixation sutures were placed to create an omental flap between the bladder and vagina. The bladder was repaired as double-layer waterproof, and a leak test showed no leakage. The omental flap was brought between the vagina and bladder and fixed with fixation sutures. Urethral foley was removed 14 days later.

Statistics and analysis

The data was analyzed using SPSS 25.0 statistical software package. Number, percentage, average and minimum-maximum expressions were used for descriptive statistics.

Results

The average age of the patients was calculated as 47.17 ± 7.09 . The general characteristics of the patients are presented in Table 1. All of the patients included in the study had a history of gynecological surgery; 32 (91.4%) had a history of hysterectomy, 2 had a myemectomy, and 1 had an oophorectomy.

Table 1. Patient characteristics

	Transvaginal Repair	Abdominal Repair	Total
Number of patients	23 (65.7%)	12 (34.3%)	35
VVF surgery history	-	9 (75%)	9
Simultaneous abdominopelvic surgery	-	2 (16.6%)	2
History of pelvic radiotherapy	-	1 (8.3%)	1

While the abdominal method was preferred in 12 (34.3%) of the patients, the transvaginal method was preferred in 23 (65.7%) patients. It was noteworthy that 9 of the patients who underwent abdominal technique had a history of VVF surgery and 1 patient had a history of radiotherapy. Recurrence was observed in 2 of 23 patients (8.6%) for whom the transvaginal technique was preferred and in 2 of 12 patients (16.6%) for whom the abdominal technique was preferred, and no significant difference was found between the two methods in terms of recurrence.

After transvaginal surgical treatment, recurrence was observed in one patient, where

a single fistula was localized on the opposite wall, and in another patient, three millimeter-sized fistulas were identified. Among the patients who underwent abdominal technique and experienced recurrence, one had a large fistula tract (4 cm), while the other exhibited adhesions and poorly healed tissues due to a previous VVF operation. Following the recurrence after abdominal VVF repair, two patients underwent a second abdominal VVF repair. For the two patients with recurrence after vaginal VVF surgery, a repeat vaginal VVF repair was performed, and in the follow-up of both groups, no further recurrences were observed. During the follow-up of the patients participating in the study, 1 patient developed

pain during sexual intercourse (dyspareunia) and 1 patient developed stress incontinence. Two of these patients were in the abdominal repair group. Additionally, in two patients who underwent abdominal VVF repair, simultaneous ureteroneocystostomy was performed.

The absence of recurrence was considered a success criterion, and the success rate was found to be 91.4% for the transvaginal technique, 83.4% for the abdominal technique. Overall, the success rate was found to be 88.6% (Table 2). Fistula characteristics are presented in Table 3.

Table 2. Recurrence and success rates of surgical techniques

	Transvaginal Repair (n:23)	Abdominal Repair (n:12)	Total (n:35)
Recurrence	2 (8.6%)	2 (16.6%)	4 (11.4%)
Success	21 (91.4%)	10 (83.4%)	31 (88.6%)

Table 3. Fistula characteristics

	Transvaginal Repair (n:23)		Abdominal Repair (n:12)		Total (n:35)	
Fistula locations within the bladder	Base	20 (87%)	Base	5 (41.7%)	Base	25 (71.4%)
	Anterior Wall	2 (8.7%)	Anterior Wall	3 (25%)	Anterior Wall	5 (14.3%)
	Trigonal Area	1 (4.3%)	Trigonal Area	4 (33.3%)	Trigonal Area	5 (14.3%)
Average Fistula Size (mm)	9 mm (5-20)		21 mm (15-40)		12 mm (5-40)	
Average Number of fistulas	1.13 (1-3)		1.17 (1-2)		1.14 (1-3)	

Discussion

Most vesicovaginal fistula repairs are performed by a small number of vesicovaginal fistula surgeons, even in regions with high prevalence [10]. In our clinic, VVF surgery is performed with a success rate of 88.6%. It was observed that vaginal (91.4%) and abdominal (83.4%) VVF surgery had similar success rates. The success rates of VVF repair with the optically guided transvaginal approach applied in our clinic are in line with the literature [3].

In the etiology of vesicovaginal fistula, a history of hysterectomy is frequently observed, accounting for 80% of cases [1]. In our clinic, 91% of patients who underwent VVF repair had a history of hysterectomy. Hysterectomy emerged as a prominent etiological factor in this patient group as well. It is noteworthy that all VVF patients presenting to our clinic had a history of gynecological surgery as the etiology, with none having a history of obstetric surgery.

Pelvic gynecological surgeries should be approached with caution in the presence of adhesions. In cases where bladder injury is suspected, it is essential to examine the bladder with cystoscopy. Fistulas developed after hysterectomy performed for malignant reasons should be considered to potentially involve malignant tissue [11].

It is necessary to comply with certain principles in vesicovaginal fistula repair, as in other operations. There must be adequate vascular support tissue in the surgical field, and no necrosis, inflammation, or malignancy should be present. A multilayered suture line should be created with absorbable sutures that is tension-free, waterproof, and avoids overlapping sutures. Continuous bladder drainage should be ensured after surgery [6, 12]. The first operation has the highest success rate in vesicovaginal fistula repair. Although the cause, location, size and onset time of the fistula

are taken into consideration when choosing a surgical technique, the method chosen may generally depend on the training and experience of the surgeon. The best method is probably the one with which the surgeon is most familiar. In the reports given by surgeons who prefer vaginal and abdominal methods, they make the choice of method by adopting their individual preferences and reviewing their experiences in their own institutions [13].

The advantages of the vaginal approach are short surgery time, short hospital stay, and less blood loss [14]. As a surgical technique, the transvaginal method is preferred in rates ranging from 42-81% [3]. In our clinic, we preferred the vaginal method more frequently (65.7%).

It is known that some factors are effective in the choice of abdominal technique. Short vaginal length for sexual intercourse, high location of the fistula, complicated fistulas, recurrence after VVF surgery, scarred fistula, history of pelvic radiotherapy, additional abdominal intervention and the need for ureter reimplantation are the prominent situations in choosing the abdominal method [14]. History of fistula surgery, history of pelvic radiotherapy, and the need for simultaneous abdominal intervention were also decisive in the choice of abdominal technique in our clinic. In our clinic, we preferred abdominal repair with a rate of 34.3%. In the 10-year meta-analysis reviewed by Shrestha et al. [3], it was reported that abdominal VVF repair was performed at a rate of 49.5%.

Recurrence was observed in two patients who were operated on via the abdominal approach. There was no feature other than a history of VVF operation in one of the patients. In the other patient, we operated on a 4 cm fistula. We performed VVF surgery again with the abdominal method on these two patients and did not observe any recurrence during follow-up. Opinions have been reported in the literature that previous VVF surgery either increases or does not change the risk of recurrence [15]. In a study examining the success factor, it was stated that one of the main determinants was the fistula size, and even the presence of >3 cm fistula was at high risk for recurrence [15]. In our study, recurrence was observed in patients with the profiles predicted in the literature.

In this study, recurrence was observed in 2 (8.6%) of our patients to whom we preferred the vaginal approach. We repaired both of these patients using the vaginal method again due to the location of the fistula. Kapoor et al. [16] reported recurrence in 1 patient (3.1%) in their 32-patient vaginal VVF repair series. The absolute contraindication for vaginal repair of vesicovaginal fistula is the coexistence of fistulas with other abdomino-pelvic organs such as ureters, small and large intestine [5]. Situations such as radiation exposure, scarred, and recurrent fistulas increase the failure rate, and these are important factors that the surgeon should consider when choosing the operation based on personal experience. These should not be considered as absolute contraindications [5], but some authors view these conditions as contraindications for VVF vaginal repair [16].

Pushkar et al. [17] evaluated the results of the vaginal approach for 210 patients who developed radiation-induced VVF. The success rate of the first repair was reported as 48.1%. They stated that the cumulative success rate was 80.4% after 3 recurrent surgeries in patients with relapse. They reported that subsequent repairs did not reduce the chance of recovery but cumulatively increased recovery rates. They emphasized that failed treatments may be due to tissue reaction to radiation exposure and recommended that re-surgery of failed fistula repair should be considered as the first surgery. In another study examining 30 patients who developed VVF after gynecological pelvic surgery, 23 patients underwent abdominal repair, 7 underwent vaginal repair, and recurrence was observed in 3 patients within 1 month. They found the overall success rate of VVF surgery to be 90%. Additionally, radiation-induced VVF patients were examined as a separate group, but a high success rate was not achieved. Urinary diversion has been emphasized as a more preferable method for this group [18]. In our study, there was only 1 patient with radiation exposure and no recurrence was observed after the first repair.

Angioli et al. [5] reviewed the studies on VVF repair. In this study, they reported that the success rate of VVF surgery in patients without radiation exposure varied between 70% and

100%, and the average success rate was 92%. Similar success rates of 91% and 96% have been reported for vaginal and abdominal repair, respectively. Another study showed that the success rate of transvaginal repair (90.8%) was higher than transabdominal repair (83.9%) [10]. In a series including 52 VVF patients, 32 patients with simple fistulas underwent vaginal repair, and 20 patients with complex fistulas underwent abdominal repair. Recurrence occurred in 1 patient who underwent vaginal repair and in 2 patients who underwent abdominal repair. They achieved more successful results in VVFs with vaginal repair [16]. In our study, the absence of recurrence was considered as the success criterion, and we determined the overall success rate to be 88.6%. The success rate was calculated as 91.4% for the vaginal approach and 83.4% for the abdominal approach. The results demonstrate success rates similar to the literature [3, 5].

Abdominal VVF repair can also be performed using laparoscopic and robot-assisted laparoscopic approaches. The success rate in large series can reach up to 86%. While minimal invasive methods are not yet common in VVF surgery, they have been successfully used in surgery performed in a single region. Despite the many advantages of minimally invasive surgery, the most successful approach is the one the surgeon is most familiar with [19].

The limitations of our study are that the patient group in our study was evaluated retrospectively and only the absence of recurrence was taken as the success criterion. As a result, in vesicovaginal fistula surgery, the characteristics of the patient and the fistula affect the success rate and direct the surgery to be preferred. However, it should not be forgotten that the surgeon's experience also plays a big role. In our clinic, vaginal and abdominal VVF surgery are performed with similar high success rates.

Conflict of interest: No conflict of interest was declared by the authors.

References

1. Malik MA, Sohail M, Malik MT, Khalid N, Akram A. Changing trends in the etiology and management of vesicovaginal fistula. *International Journal of Urology* 2018;25:25-29. <https://doi.org/10.1111/iju.13419>
2. De Ridder D. Vesicovaginal fistula: a major healthcare problem. *Current Opinion in Urology* 2009;19:358-361. <https://doi.org/10.1097/MOU.0b013e32832ae1b7>
3. Shrestha DB, Budhathoki P, Karki P, et al. Vesicovaginal fistula in females in 2010–2020: a systemic review and meta-analysis. *Reproductive Sciences* 2022;29:3346-3364. <https://doi.org/10.1007/s43032-021-00832-8>
4. Medlen H, Barbier H. *Vesicovaginal Fistula*. StatPearls. Treasure Island (FL): StatPearls Publishing; 2023.
5. Angioli R, Penalver M, Muzii L, et al. Guidelines of how to manage vesicovaginal fistula. *Critical Reviews in Oncology/Hematology* 2003;48:295-304. [https://doi.org/10.1016/s1040-8428\(03\)00123-9](https://doi.org/10.1016/s1040-8428(03)00123-9)
6. Kumar S, Kekre NS, Gopalakrishnan G. Vesicovaginal fistula: an update. *IJU* 2007;23:187-191. <https://doi.org/10.4103/0970-1591.32073>
7. El Azab AS, Abolella HA, Farouk M. Update on vesicovaginal fistula: a systematic review. *Arab Journal of Urology* 2019;17:61-68. <https://doi.org/10.1080/2090598X.2019.1590033>
8. Tancer ML. Observations on prevention and management of vesicovaginal fistula after total hysterectomy. *Surg Gynecol Obstet* 1992;175:501-506.
9. Zumrutbas AE, Ozlulderden Y, Alkis O, Baser A, Aybek Z. Optic-guided vaginal repair of vesicovaginal fistula. *Journal of Endourology* 2014;28:275-279. <https://doi.org/10.1089/end.2013.0435>
10. Hillary CJ, Osman NI, Hilton P, Chapple CR. The aetiology, treatment, and outcome of urogenital fistulae managed in well-and low-resourced countries: a systematic review. *European Urology* 2016;70:478-492. <https://doi.org/10.1016/j.eururo.2016.02.015>
11. Kaplan Ö, Güney M. Obstetrik ve jinekolojik operasyonlar sonrasında gelişen vezikovajinal fistüllerin retrospektif değerlendirilmesi. *SDÜ Tıp Fak Derg* 2014;21:72-77.
12. Ayed M, Atat RE, Hassine LB, Sfaxi M, Chebil M, Zmerli S. Prognostic factors of recurrence after vesicovaginal fistula repair. *International Journal of Urology* 2006;13:345-349. <https://doi.org/10.1111/j.1442-2042.2006.01308.x>
13. Blaivas JG, Heritz DM, Romanzi LJ. Early versus late repair of vesicovaginal fistulas: vaginal and abdominal approaches. *J Urol* 1995;153:1110-1113.
14. McKay E, Watts K, Abraham N. Abdominal approach to vesicovaginal fistula. *Urol Clin N Am* 2019;46:135-146. <https://doi.org/10.1016/j.ucl.2018.08.011>
15. Ockrim JL, Greenwell TJ, Foley CL, Wood DN, Shah PJR. A tertiary experience of vesico-vaginal and urethro-vaginal fistula repair: factors predicting success. *BJU International* 2009;103:1122-1126. <https://doi.org/10.1111/j.1464-410X.2008.08237.x>

16. Kapoor R, Ansari M, Singh P, et al. Management of vesicovaginal fistula: an experience of 52 cases with a rationalized algorithm for choosing the transvaginal or transabdominal approach. *Indian J Urol* 2007;23:372-376. <https://doi.org/10.4103/0970-1591.36709>
17. Pushkar DY, Dyakov VV, Kasyan GR. Management of radiation-induced vesicovaginal fistula. *European Urology* 2009;55:131-138. <https://doi.org/10.1016/j.eururo.2008.04.044>
18. Langkilde NC, Pless TK, Lundbeck F, Nerstrøm B. Surgical repair of vesicovaginal fistulae: a ten-year retrospective study. *Scand J Urol Nephrol* 1999;33:100-103. <https://doi.org/10.1080/003655999750016069>
19. Tenggardjaja CF, Goldman HB. Advances in minimally invasive repair of vesicovaginal fistulas. *Curr Urol Rep* 2013;14:253-261. <https://doi.org/10.1007/s11934-013-0316-y>

Ethics committee approval: Permission was obtained from Pamukkale University Non-Interventional Clinical Research Ethics Committee for the study (permission date (14.03.2023 and permission number 05).

Authors' contributions to the article

K.K. constructed the main idea and hypothesis of the study. A.S. developed the theory and arranged/edited the material and method section. Discussion section of the article written by M.B.D., Y.O. and S.C. reviewed, corrected and approved. In addition, all authors discussed the entire study and approved the final version.