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ORIGINAL PAPER

Surgeon's point of view in vesico-vaginal fistula management

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Summary ***Objectives: Vesicovaginal fistulas (VVF) are the most commonly acquired fistulas of the urinary tract. The management of VVF is mainly based on expert opinion and surgeon experience. This study aims to provide the practice patterns and outcomes of vesicovaginal fistula (VVF) management in Indonesia.***

Methods: This study utilizes the results of a survey among the surgeons who performs VVF repair in referral hospitals throughout Indonesia between June and July of 2021. Data analysis was carried out with SPSS descriptively by displaying the relative frequency of the answers to each question of the questionnaire form.

Results: We collected responses from 93 respondents consisting of 68 urologists and 25 gynecologists. The most commonly reported cause of VVF was obstetric (50.5%). Most respondents confirmed the diagnosis of VVF by cystoscopy (81.7%). Waiting time to repair VVF was generally 12 weeks (79.6%), while the transvaginal approach repair was more often performed (77.4%). An additional procedure, such as tissue interposition was performed in 50.5% of cases. Tissue interposition was mostly indicated in recurrent VVF (81%), with omentum being the most selected tissue interposition (71%). When indicated, the most selected method of transabdominal approach was open transvesical (54,84%). A laparoscopic approach was performed only in 7.5% of cases. Overall, the success rate for VVF repair in Indonesia was 70-100% at first attempt.

Conclusions: The transvaginal approach is preferred, either with or without an interposition tissue flap. The success rate at the first attempt is satisfactory.

KEY WORDS: Vesicovaginal fistula; Genitourinary fistula; Fistula.

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INTRODUCTION

Vesicovaginal fistulas (VVF) are the most commonly acquired fistulas of the urinary tract (1). Although rarely fatal, VVF causes great concern because of its disturbance to a patient's quality of life, encompassing physical, emotional, psychological, and economic aspects. To date, there has never been a comprehensive worldwide survey designed to precisely determine the information on vesicovaginal fistula. The incidence is pinpointed because of underdiagnosis and lack of awareness of this condition. Previous research has found that VVF incidence is higher in low-and middle-income countries, although there is also a relatively high incidence in high-income countries (1-3). At least 3 million women in third-world countries are affected by this condition (4). In African countries alone, up to 130.000 new cases are found each year (5). Indonesia, a developing country, also suffers greatly from the high prevalence of VVF (6). Therefore, many women with VVF are undiagnosed and untreated, leaving quite a complex healthcare problem (5, 6).

Despite its significant impact, there has yet to be a consensus on the optimal approach to treat VVF. The choice of therapy is mainly based on expert opinion and surgeon experience. Currently, the *European Association of Urology* guidelines have no specific algorithm for VVF repair (7). Furthermore, it is lacking a surgical treatment algorithm based on the characteristics of the fistula. The purpose of this study was to review practice patterns and outcomes of VVF treatment in Indonesia to aid practitioners in selecting appropriate management for their patients.

METHODS

This research is an observational study with a cross-sectional design. The sample selection was carried out by voluntary reply to a survey link which was sent to surgeons who performs VVF repair in referral hospitals throughout Indonesia. The invited surgeons were urogynecologists, female urologists, and general urologists who had a course of VVF repair. The *Indonesian Urology Association* and *Indonesian Obstetrics and Gynecology Association* facilitated the research by listing the surgeon performing VVF repair. This study was conducted between June and July 2021. Data collection was limited to one year prior to survey completion. We tried to increase the sample after the end of the pandemic era, but the additional data did not meet the inclusion criteria.

The assessment of all variables was carried out using a structured questionnaire in electronic form. Data collected in the survey period were downloaded from the serv-

er in the format of Excel data. Data analysis was carried out with SPSS descriptively by displaying the relative frequency of the answers to each question of the questionnaire form.

Results

VVF in Referral Hospitals in Indonesia

Ninety-three respondents were surgeons who performed VVF repair in various referral hospitals in Indonesia. Most of the surgeons were urologists (51.6%). The number of VVF cases managed by each practitioner was generally less than 10 cases in 1 year (91.4%), with the most common etiologies being obstetric etiology, which consist of vaginal delivery, caesarean section procedure, and caesarean hysterectomy (50.5%) and iatrogenic etiology, which is related to urinary tract injuries during abdominal surgery (Table 1).

The choice of modalities used for diagnosing VVF varied, with cystoscopy being the most common examination used by 81.7% of surgeons (Figure 1). It was followed by the dye/methylene blue test (64.5%), cystography (60.2%), pelvic examination (53.8%), and intravenous

Table 1.
The Characteristics of VVF Cases at the Referral Hospitals in Indonesia.

Variable	n	%
Operator		
General urologist	48	51.6
Female urologist	20	21.5
Urogynecologist	25	26.9
Number of WF repairs per year		
< 10	85	91.4
10-20	8	8.6
Most common WF etiology		
Obstetric	47	50.5
Iatrogenic	45	48.4
Radiation	1	1.1
Obstetric WF cases		
None	7	7.5
< 5%	26	28
5-10%	9	9.7
> 10%-20%	9	9.7
> 20%	39	41.9
No answer	3	3.2

Figure 1.
Diagnostic modalities of VVF.

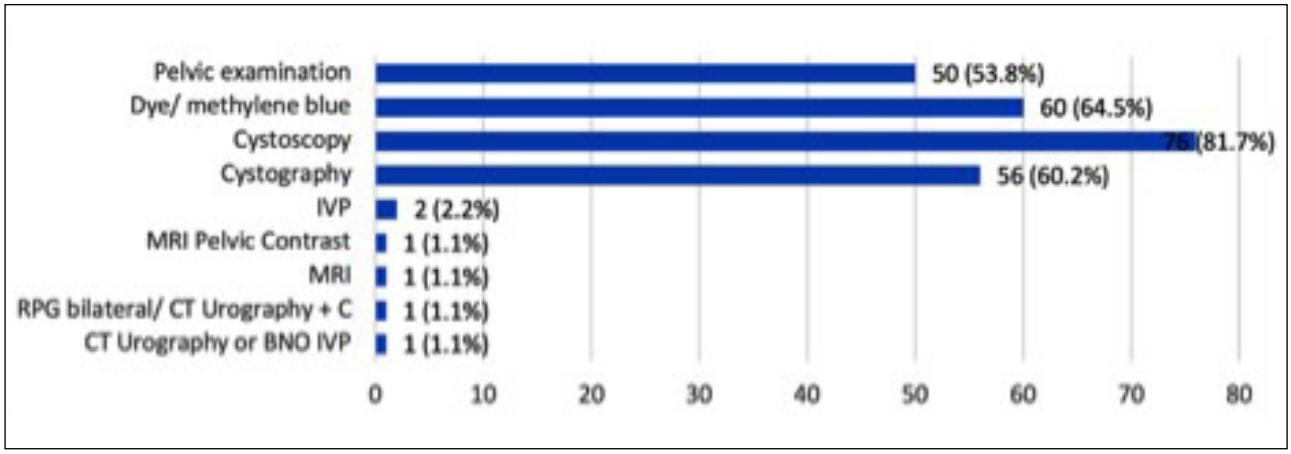


Figure 2.
The abdominal approach in VVF repair.

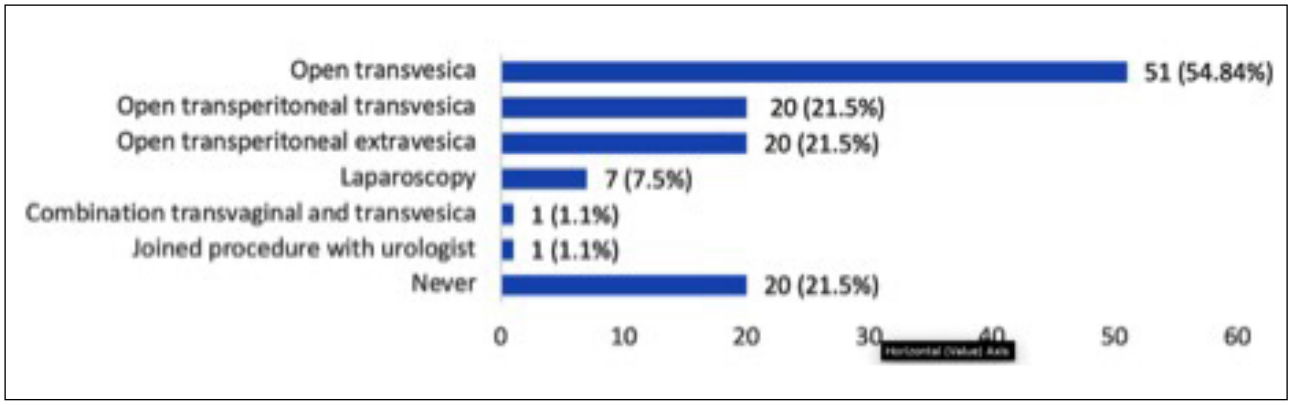


Figure 3.
Indication for the use of interposition tissue.

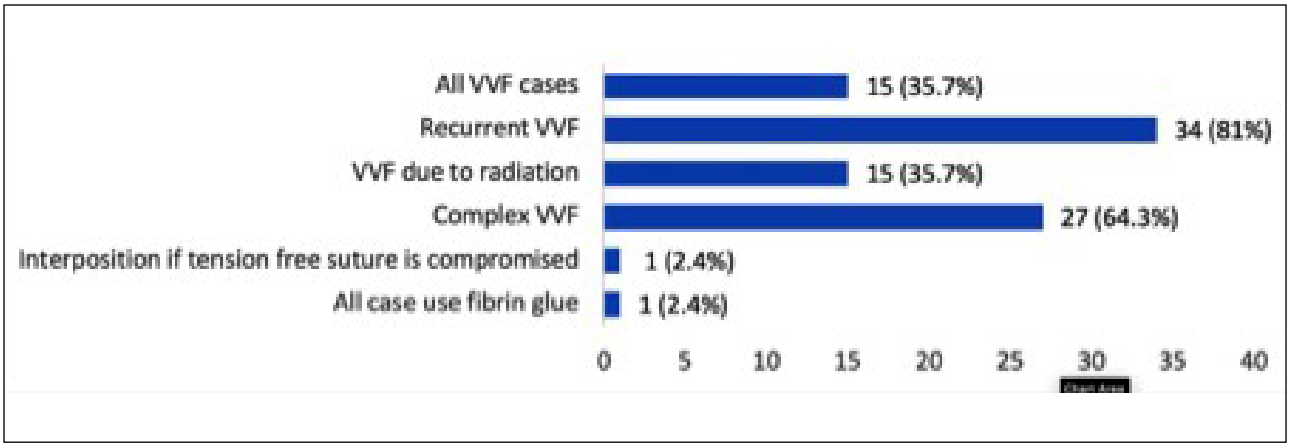
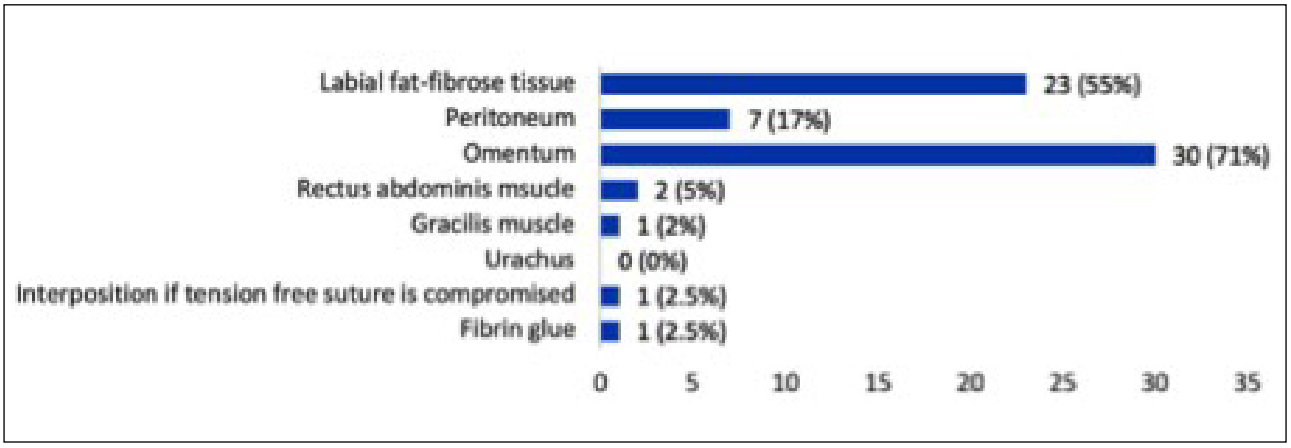


Figure 4.
Tissue interposition for VVF repair.



pyelography (IVP) (2.2%). In the case of iatrogenic VVF, the majority of surgeons (65.6%) did not routinely perform an IVP as the first examination.

Most of the surgeons (79.6%) choose 12 weeks to perform VVF repair. The transvaginal approach for VVF repair was carried out by 77.4% of respondents. When indicated the most selected method of transabdominal approach was open transvesical (54.84%), as shown in Figure 2.

As many as 50.5% of surgeons did not use tissue interposition for VVF repair. Tissue interposition was indicated for recurrent VVF (81%), complex VVF (64.3%), in all cases (35.7%), and radiation cases (35.7%) (Figure 3).

The most widely used interposition was the omentum (71%) (Figure 4), followed by labial fat-fibrose tissue (55%), and peritoneum (17%).

Most surgeons did not routinely give antimuscarinic to the patient after VVF repair (72%).

In comparison, respondents' opinion was quite divided on the use of ureteral protection during VVF repair: 50.5% did not do it routinely, while 46.2% did it routinely. Overall, the first attempt at VVF repair was quite successful, with only 16.1% of respondents having < 70% success (Table 2).

Table 2.
Overview of the Management of VVF at the Referral Hospital in Indonesia.

Variable	n	%
IVP Examination Iatrogenic VVF		
Routinely	32	34.4
Unroutinely	61	65.6
Waiting time for traumatic VVF repair		
2 weeks	5	5.4
4 weeks	5	5.4
6 weeks	1	1.1
8 weeks	5	5.4
10 weeks	1	1.1
12 weeks	74	79.6
VVF repair by transvaginal approach		
Yes	72	77.4
General urologist	27	29.0
Female urologist	20	21.5
Gynecologist	25	26.9
No (General urologist)	20	21.5
Percentage of VVF repair by transvaginal approach		
< 25%	11	14.7
25-50%	10	13.3

> 50-75%	10	13.3
> 75-< 100%	21	28.0
100%	23	30.7
Tissue transposition for WF repair		
Yes	42	45.2
No	47	50.5
Ureteral protection during WF repair		
Routinely	43	46.2
Unroutinely	47	50.5
Antimuscarinic medication after WF repair		
Routinely	22	23.7
Unroutinely	67	72
Successful rate after the first attempt WF repair		
< 70%	15	16.1
70-75%	16	17.2
> 75-80%	7	7.5
> 80-85%	11	11.8
> 85-90%	13	14.0
> 90-95%	9	9.7
> 95-< 100%	14	15.1
100%	6	6.5

Discussion

Vesico vaginal fistula is the most common fistula found in the daily clinical setting (> 72%), occurring mainly from obstetrical complications (80%) (5, 6, 8). This research confirms this finding with obstetrical complication being the most common cause for VVF (50.5%), followed with iatrogenic (48.1%). In this survey, cystoscopy was the most frequent diagnostic modality used by respondents to diagnose VVF (81.7%), followed by dye/methylene blue (64.5%) and cystography (60.2%). Patients with vesicovaginal fistula usually present with symptoms of continuous urinary leakage. The severity of the clinical manifestation depends on the size of the fistula. In the examination, the surgeons must evaluate the fistula's size, number, and site to plan treatment (3). Through previous clinical experience, it was found that diagnostic modalities differ in each management area, and urologists tend to confirm VVF by performing cystoscopy. Meanwhile, intravenous pyelography is another modality used to diagnose a concurrent ureteral injury. However, only 34.4% of surgeons apply this modality. Evaluation of the upper urinary tract might be essential because up to 12% of postsurgical VVFs have an associated ureter injury (9). The choice of the diagnostic modality highly depends on resource availability and operator judgment.

The timing of VVF repair is of utmost importance because the first attempt of treatment is correlated with the best possible outcome (3, 10). Timing of repair is subject to numerous factors, such as current illness, other comorbidities, nutritional status, and immunity of the patient. This research also observes that the common waiting time from VVF diagnosis to repair was 12 weeks (79.6%). This finding is in agreement with the literature, reporting an expected waiting time of 12 weeks (3). Other waiting timing options reported were 2, 4, and 8 weeks with an equal response rate of 5% (3). The only exception to this timing is VVF caused by radiation, which usually needs about six months to 1 year of waiting time from diagnosis to repair (3, 4). This timing also considers tissue necrosis and subsidence of inflammation after childbirth and postsurgical VVF (3). Other things that need to be considered are hemostasis and adequate vascular supply, sufficient exposure and tissue mobilization, and also tensionless suture (3).

The transvaginal approach is also more favored in the repair of VVF, as also observed in previous studies (3, 4, 11, 12). In this research, 77.4% of surgeons choose transvaginal approach in VVF repair. Furthermore, 30.7% of surgeons use a transvaginal approach in 100%, whereas 28% of surgeons use it in 75-100% of cases. We found that all participants who did not perform the transvaginal approach were urologists, who usually preferred for the transabdominal approach based on familiarity and preferences acquired during residency. This difference is becoming increasingly blurred as urologists gain more experience and comfort in transvaginal surgery for various disparate indications. The transvaginal approach is favored because it significantly reduces the risk of hemorrhage, offers numerous interposition flaps options, implies a shorter surgery time and rapid recovery (3). However, abdominal approach should be considered if there are contraindications for transvaginal approach. It should be also considered in presence of associated bladder stones or in the case of high-position fistula with an anatomically narrow vagina. The most recommended transabdominal approach, which once was the gold standard for VVF repair, is the O'Connor procedure which includes an intraperitoneal approach. The most used transabdominal method for VVF repair in the present study was the open transvesical approach (54.84%) followed by open transperitoneal transvesical (21.5%) and open transperitoneal extravesical approach (21.5%). In 7.5% of all cases, a laparoscopic approach was chosen. The laparoscopic approach is relatively more efficient and less invasive, with less downtime and complications (14). There are still debates about the best transabdominal method, although it can be concluded that the most recommended procedure is most probably the procedure in which the operator feels most confident and trained (3, 4, 10).

Application of tissue transposition is made by only 45.2% of surgeons participating in the survey, whereas 50.5% surgeons do not. There are differences in the type of tissue interposition between urologists and gynecologists, where 53.6% of urologists prefer to use omentum (65%) and labia fat fibrous tissue (46%). In comparison, only 20% of urogynecologists perform transposition flaps and prefer to use omentum and labial fat for tissue transposition equally. *Evans et al.* (12), found that a 100% success rate was observed in applying tissue transposition in repair, whereas a 63% success rate was observed in repair without tissue transposition. However, a study by *Pshak et al.* (15) found that the cure rate without tissue transposition application is 100%. In our survey, surgeons mainly apply tissue transposition in the cases of recurrent VVF (81%), complex VVF (64.3%), and VVF due to radiation (35.7%). The anatomical organ mostly used for tissue transposition is the omentum (71%), followed by labial fat-fibrous tissue and peritoneum. Other tissue transposition flaps that can be used are gracilis muscle, and urinary bladder mucosa advancement flaps (10). As an alternative Floseal hemostatic matrix can be used. Previous studies have stated that no technique is superior than another, and tissue

used for transposition depends on technical approach, surgeon's clinical experience, and preference (4).
In our survey, only 46.2% surgeons routinely insert a ureteral catheter for ureter protection, whereas 50.5% do not. This choice depends on considering the risk of ureteral injury during the dissection and suturing of the fistula. Antimuscarinic medication benefits the patient by alleviating discomfort postoperatively and reducing bladder spasms (6, 16). Still, some surgeons choose to give antimuscarinics only if there is a complaint of urgency or discomfort during the use of the catheter instead of giving it routinely as seen in the results of our survey, where only 23.7% of surgeons administer antimuscarinic medication for patients during the use of the catheter.
The overall success rate is defined as the overall percentage of all patients recovering completely, as clinically demonstrated by termination of constant leaking of urine after removal of the postoperative catheter (4). In this research, most surgeons report a 70-100% success rate at first attempt, regardless of the repair technique. A similar success rate in the first attempt repair (70-100%), was found throughout the literature for both vaginal and abdominal approaches (17). One of the latest studies by Warner et al. found a success rate at first attempt repair of 91% (vaginal) and 86% (abdominal) (18). However, success rates can be as low as 42% in other studies, which are negatively affected by the difficulty of repair (19). Factors of repair failure are vaginal delivery and partial or total damage of the urethra, and also malignant etiology of the fistula and its further management by chemotherapy and radiotherapy that could delay the healing phase of the fistula repair (20). There are several nonrandomized cohort studies reporting results from both abdominal and vaginal procedures with overall closure rates at the first operation of 89% and 87%, respectively (21, 22).
The authors considered a limitation of this study the fact that being the most preferred technique did not guarantee its superiority. However, this is the first study that assesses the VVF treatment from the surgeon's point of view, which might help and guide the VVF treatment based on Indonesian experiences. The location of the hospital and the resources of the hospital may affect a differing clinical judgment in each case. We recommended further research on VVF repair with population-based research and global surveys of fistula patient management in each hospital.

Conclusions

Management of VVF in Indonesia was initiated with cystoscopy. Most operators choose to repair VVF after 12 weeks, with the transvaginal technique being the most common approach. The use of tissue interposition is usually done in a complex VVF. Overall, the success rate for VVF repair in Indonesia is 70-100% at first attempt.

Ethical approval

Ethical approval has been acquired in this study by *Health Research Ethics Committee* of Prof. I.G.N.G. *Ngoerah General Hospital, Denpasar, Indonesia* with no. 2267/UN14.2.2.VII.14/LT/2023.

References

1. El-Azab AS, Abolella HA, Farouk M. Update on vesicovaginal fistula: a systematic review. Arab J Urol. 2019; 17:61-8.

2. Haroun A, Ali Mahamat M, Abdel Salam S, Cherif H, Jalloh M, Niang L, et al. The epidemiological, clinical and therapeutical aspects of the vesico-vaginal fistula at the national fistula treatment center in N'apos Djamena. Int J Clin Urol. 2020; 4:34.

3. Rajaian S, Pragatheeswarane M, Panda A. Vesicovaginal fistula: review and recent trends. Indian J Urol. 2019; 35:250.

4. Abrams P, de Ridder D, deVries C, Elneil S, Esegbona G, Mourad S, et al. Obstetric fistula in the developing word. ICUD-SIU International consultation, Marrakech, Morocco, October 13-16, 2010.

5. Lo TS, Chua S, Wijaya T, Kao CC, Uy-Patrimonio MC. Clinical relevance and treatment outcomes of vesicovaginal fistula (VVF) after obstetric and gynecologic surgery. Taiwan J Obstet Gynecol. 2019; 58:111-6.

6. Mukti NA, Mochtar AA, Wiyati PS. Kejadian fistula urogenital pada perempuan di RSUP Dr. Kariadi Semarang. 2018; 7:16.

7. Harding CK, Lapitan MC, Arlandis S, Bo K, Cobussen-Boekhorst H, Costantini E, et al. EAU Guidelines on Management of Non-Neurogenic Female Lower Urinary Tract Symptoms. EAU Guidelines 2023. 2023:91-95.

8. Adibarata MA, Aditya R, Gumilar KE, Pascawardhana M, Wicaksono B, Ernawati, et al. Bacterial vaginosis in gynecologic outpatient clinic Dr. Soetomo Hospital January - June 2017: A Cross Sectional Study. In Proceedings of the 23rd Regional Conference of Dermatology (RCD 2018), Scitepress 2021, pp 307-311.

9. Goodwin WE, Scardino PT. Vesicovaginal and ureterovaginal fistula: a summary of 25 years of experience. J Urol. 1980; 123: 370-4.

10. Shrestha DB, Budhathoki P, Karki P, Jha P, Mainali G, Dangal G, et al. Vesico-vaginal fistula in females in 2010-2020: a systemic review and meta-analysis. Reprod Sci. 2022; 29:3346-3364.

11. Margules AC, Rovner ES. The use of tissue flaps in the management of urinary tract fistulas. Curr Urol Rep. 2019; 20:32.

12. Singh V, Mehrotra S, Bansal A, Akhtar A, Sinha RJ. Prospective randomized comparison of repairing vesicovaginal fistula with or without the interposition flap: result from a tertiary care institute in Northern India. Turk J Urol. 2019; 45:377-83.

13. Warner R, Beardmore-Gray A, Pakzad M, Hamid R, Ockrim J, Greenwell T. The cost effectiveness of vaginal versus abdominal repair of vesicovaginal fistula. Int Urogynecology J. 2020; 31:1363-9.

14. Giannakopoulos S, Arif H, Nastos Z, Liapis A, Kalaitzis C, Touloupidis S. Laparoscopic transvesical vesicovaginal fistula repair with the least invasive way: only three trocars and a limited posterior cystotomy. Asian J Urol. 2020; 7:351-6.

15. Pshak T, Nikolavsky D, Terlecki R, Flynn BJ. Is tissue interposition always necessary in transvaginal repair of benign, recurrent vesicovaginal fistula? Urology. 2013; 82:707-12.

16. Breen M, Ingber M. Controversies in the management of vesicovaginal fistula. Best Pract Res Clin Obstet Gynaecol. 2019; 54:61-72.

17. Stamatakos M, Sargedi C, Stasinou T, Kontzoglou K. Vesicovaginal Fistula: diagnosis and management. Indian J Surg. 2014; 76:131-6.

18. Warner R, Beardmore-Gray A, Pakzad M, Hamid R, Ockrim J, Greenwell T. The cost effectiveness of vaginal versus abdominal repair of vesicovaginal fistula. Int Urogynecology J. 2020; 31:1363-9.

19. Bernard L, Giles A, Fabiano S, Giles S, Hudgins S, Olson A, et al.

Predictors of obstetric fistula repair outcomes in Lubango, Angola. J Obstet Gynaecol Can. 2019; 41:1726-33.

20. Delamou A, Delvaux T, Beavogui AH, Toure A, Kolié D, Sidibé S, et al. Factors associated with the failure of obstetric fistula repair in Guinea: implications for practice. Reprod Health. 2016; 13:135.

21. Hilton P. Urogenital fistula in the UK: a personal case series managed over 25 years. BJU Int. 2011; 110:102-10.

22. 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 Int. 2009; 103:1122-6.

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