

# Modified Martius Flap for repair of a postradiation Rectovaginal Fistula (RVF). A case report.

Flaviu Ionut Faur <sup>1,3\*</sup>, Paula Suciuc <sup>5</sup>, Catalin Flavius Prodan-Barbulescu <sup>3,4</sup>, Adelina Clim <sup>5</sup>, Ionel Nati <sup>2,5</sup>, Gabriel Lazar <sup>1,2</sup>

<sup>1</sup>I st Surgery Clinic, “ Prof Dr Ion Chiricuta ” Institute of Oncology

<sup>2</sup>“Iuliu Hatieganu” University of Medicine and Pharmacy Cluj-Napoca, Romania

<sup>3</sup>II nd Surgery Clinic, Timisoara Emergency County Hospital, Romania

<sup>4</sup>“Victor Babes” University of Medicine and Pharmacy Timisoara Romania

<sup>5</sup>II nd Obstetric and Gynecology Clinic “Dominic Stanca” Cluj-Napoca, Romania

\*Corresponding Author: Flaviu Ionut Faur, I st Surgery Clinic, “Prof Dr Ion Chiricuta” Institute of Oncology Romania.

Received Date: August 29 2022 | Accepted Date: September 05 2022 | Published Date: October 17 2022

Citation: Flaviu I. Faur, Suciuc P., Catalin F. P. Barbulescu, Clim A., Nati I., et. al (2022). Modified Martius Flap for repair of a postradiation Rectovaginal Fistula (RVF). A case report. *International Journal of Clinical Case Reports and Reviews*. 12(1); DOI:10.31579/2690-4861/251

Copyright: © 2022 Flaviu Ionut Faur, This is an open-access article distributed under the terms of the Creative Commons Attribution License, which permits unrestricted use, distribution, and reproduction in any medium, provided the original author and source are credited.

## Abstract

**Introduction:** A rectovaginal fistula (RVF) is an abnormal connection between the rectum’s lower part and vagina’s posterior wall. It takes up approximately 6% of the overall anorectal fistulas, which are responsible for patients’ psychosocial collapse due to the incapacitating symptoms observed amongst the patients.

**Case presentation:** The study case presented was of a 33-year-old woman previously diagnosed with squamous carcinoma of the cervix FIGO IIIA (2017) treated through means of curative radiochemotherapy, utero-vaginal intracavitary brachytherapy (GammaMed plus iX 14 Gy/PTV-HR/ 2 weeks). In April 2021, she presented herself at the surgery unit claiming exclusion of fecal through the vagina and constant perineal pain. As a result of the clinical examination of the Milligan perineal area (vaginal touch, rectal touch), and presenting a positive Carey test (the methylene blue test – positive, bubble air test – positive), it was confirmed a recto-vaginal connection, positioned at around 3-4 cm from the EAS. This was followed by a loco-regional exploration through pelvic MRI scan which confirmed a lower recto-vaginal connection (fistula), situated at approximative 3 cm from the EAS, with a diameter of 8 mm (Rothenberger I).

**Conclusions:** There are a lot of metrics in the specialized literature that emphasize the versatility and feasibility of the Martius/mMartius procedure regarding the resolution of the RVF located in the lower, respectively median sphere. This metrics are also sustained by the anatomic flexibility of the perineal area regarding the loco-regional vasculature. An important aspect of this procedure is also related to the RVF’s etiology, and that is because the local surgical intervention needs to be performed in minimum inflammatory circumstances, when the tissues do not present any tumoral impregnation.

**Key words:** rectovaginal fistula; mmartius flap; sars-cov2; ICG; sexual function; postradiation fistula.

## Introduction

A rectovaginal fistula (RVF) is an abnormal connection between the rectum’s lower part and vagina’s posterior wall. It takes up approximately 6% of the overall anorectal fistulas, which are responsible for patients’ psychosocial collapse due to the incapacitating symptoms observed amongst the patients [1-2]. Moreover, RVF can also lead to recurring infections at the vagina or the lower urinary tract level.

## Etiology

Approximately 88% of the RVFs are caused by obstetrical traumas caused, on their end, by a damage at the rectovaginal septum level. Besides the obstetrical traumas, RVFs can also appear as a result of: an intervention performed at the colorectal level, or even during a surgical procedure at the pelvic level (up to 10% of the proctectomy cases are particularly associated with the use of surgical staples, with neoadjuvant and adjuvant chemotherapy), the irradiation process which can cause a phenomenon of obliterating endarteritis along with the devascularization of the perineal region, neoplasia (for instance rectal, vaginal and bladder carcinoma which can cause a direct invasion) and local inflammatory processes:

diverticulitis, chronic intestinal inflammatory disease [3-5]. The traumas on the perineal region can also result in RVF.

Postradic rectovaginal fistula' frequency is approximately between 6%-10% with the most frequent appearance in the case of endometrial, cervical, and vaginal cancer, and a very important criteria to emphasize in regards with its etiology is the fact that RVF is dependent on the level of irradiation [7]. The diagnosis of the postradic RVF usually happens during the first 2 years since the beginning of therapy however, during the same period, tardive fistula can also be diagnosed. When dealing with RVF one important thing to take into consideration is the exclusion of the local recurrences through the marginal biopsy process at the fistula's hole [8]. Fecal diversion is a primordial therapeutic stage which has a high and important impact on minimizing the symptoms [9-10].

## Classification

Rectovaginal fistula types were classified by Rothenberger into simple and complex as it follows:

- Simple RVFs: situated on the lower and medial third region of the vagina, with a diameter less than 2.5 cm, usually caused by traumas or infections
- Complex RVFs: situated on the upper third of the vagina, with a diameter higher than 2.5 cm, normally caused by an inflammatory intestinal disease (Crohn disease), irradiation or neoplasia. [11]

## Diagnosis

Whereas the diagnosis can be easily confirmed by distal examination of the rectum, the treatment, especially of the recurring fistula, could be a very complex one. A small dimension fistula could even be asymptomatic, but on the other hand, the RVF evolution is manifested through severe clinical phases such as: defecation and eliminating gases through the vagina, tenesmus, rectorrhagia, diarrhea, pollakiuria, abdominal pain, lower back pain or an anorectal burning feeling.

The fistula's anatomical situs needs to be identified in a brief way by emphasizing its direction, length, diameter, and path, and this is because some elements such as fistula diameter represents an important aspect in choosing the surgical procedure. Rectoscopy, sigmoidoscopy or the anorectal examination along with the identification of the fistula holes are simple and frequently chosen methods for the diagnosis process. The radiological examination regarding the rectovaginal fistula includes procedures such as: vaginogram, fistulogram and the barium meal. The inherited technics for the diagnosis of the rectovaginal fistulas as described by Carey and respectively Lockhart-Mummery are still highly used. Also, Shieh and Gennaro have reported a percentage of 9% for the diagnosis of the rectovaginal fistulas using the Carey technique [15].

Patient's medical history, together with a clinical examination which included proctoscopy and vaginal examination, are influencing in approximately 90% of the cases to setting a RVF diagnosis.

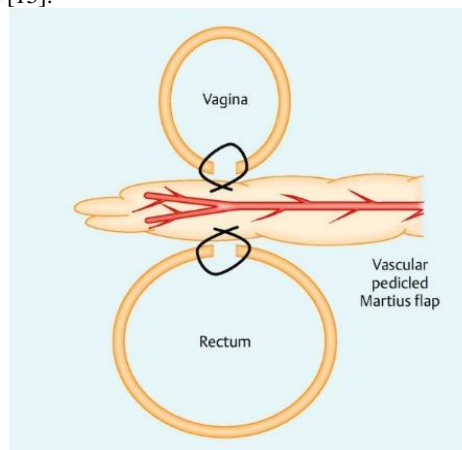
In case the diagnosis is still unclear, the next step is to conduct more imagistic examinations such as: nuclear magnetic resonance (NMR), computed tomography (CT) with contrast material, endoscopic ultrasound (EUS). NMR and EUS have the highest rate of diagnosis, both offering the possibility to examine, at the same time, other potential injuries at the sphincter level [16-17]. The CT with contrast material is the second most used procedure, this examination being very precise in diagnosing abscess' formations or any malign tumors which represent RVF comorbidities. The biggest advantage of EUS procedure is its high availability and the fact that it also offers the possibility to evaluate potential injuries at the sphincter level, which are very important in the process of choosing the correct surgical procedure [18]. The manometry study at the sphincter level can be regarded as an important criterion in the way the rectovaginal fistulas are treated [19]. The intestinal clearance and the minimalization of the gut microbiota are primordial therapeutic phases which increase the surgical success.

## Treatment

Regardless the fact that there are various treatment methods for RVF, they all depend on where the fistula is located and also on other potential comorbidities that the patient might have. Small dimensions RVFs are usually addressed using an approach at the anus, vagina, or perineal level (20). Transabdominal approaches are usually used to address superior fistulas. Treating fistula via anatomic processes is associated with a lower success rate compared to approaching it via a combination of the processes along with the adjuvant interposition of the healthy and vascularized tissue.

Rectovaginal fistulas represent a challenge for both the patients and the surgeons. Conventional therapy frequently fails which makes the surgical intervention to be the most sustainable approach for reconstructing the fistula.

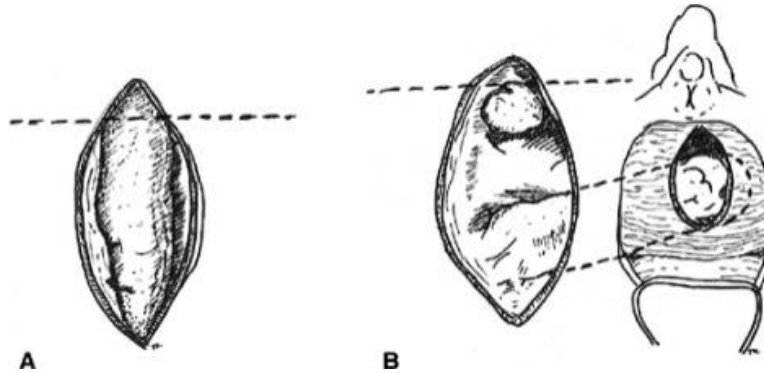
One surgical procedure that offers the proper reconstruction of the lower and median rectovaginal fistulas consists of the interposition of a bulbocavernosus tissue flap and is called the Martius modified labial fat pad flap or shortly Martius flap. Being firstly approached by professor doctor Heinrich Martius in 1928 at Gottingen, the Martius technique was afterwards modified and adjusted. Nowadays, it is used in the reconstruction process of various anomalies of the pelvic floor. The global success rate of the interposition of the Martius flap as additional procedure in the surgical process of the RVF s reported in the specialized literature and publications was of 65-100% [21].



## The Martius Procedure

After a horizontal perineal incision, the rectovaginal area (Tyrell fascia and Proust-Barbilian septum) is stabled, the fistula is dissected, while the posterior vaginal wall and the rectal mucosa are closed with unique stitches. When putting in practice the Martius procedure, there is only one area used for the reconstruction of the RVFs. Following precise

measurements (6 cm – perineum, 45 degrees – antero-cranial direction and 8 cm – cranial), a second major incision is performed, that of the vertical labia, with the aim of dissecting the posterior adipose tissue flap. The modified Martius flap procedure is later transferred on the back side, under the ischiocavernosus muscle and then stitched with no tension in the rectovaginal area, so that it would overlap with the vagina stiches and the rectal ones [22].



A. The fibrofatty tissue is mobilized with preservation of either the superior or the inferior blood supply.

B. The graft is tunneled to the site of the repair (23).

## Literature review

### Case presentation

The study case presented was of a 33-year-old woman previously diagnosed with squamous carcinoma of the cervix FIGO IIIA (2017) treated through means of curative radiochemotherapy, utero-vaginal intracavitary brachytherapy (GammaMed plus iX 14 Gy/PTV-HR/ 2 weeks). In April 2021, she presented herself at the surgery unit claiming exclusion of fecal through the vagina and constant perineal pain. As a result of the clinical examination of the Milligan perineal area (vaginal touch, rectal touch), and presenting a positive Carey test (the methylene blue test – positive, bubble air test – positive), it was confirmed a recto-vaginal connection, positioned at around 3-4 cm from the EAS. It was then decided an endoscopic exploration (sigmoidoscopy) whose results confirmed a recto-vaginal connection at about 4 cm from the EAS, with a diameter of approximately 1 cm. This was followed by a loco-regional exploration through pelvic MRI scan which confirmed a lower recto-vaginal connection (fistula), situated at approximative 3 cm from the EAS, with a diameter of 8 mm (Rothenberger I). It was afterwards decided to collect a circumferential biopsy at the fistula situs level (EHP: lymphoplasmacytic inflammatory sample, without any indication of local tumor relapse). As a first therapeutic step, we procured a diversion of the fecal matter (for 8-12 weeks) using as the main procedure the Volkmann colostomy. This was done through laparoscopic procedure, with a favorable postoperative evolution. The dynamic observation of the case took place every 4 weeks. However, during the process, the patient got infected with SARS COV2,

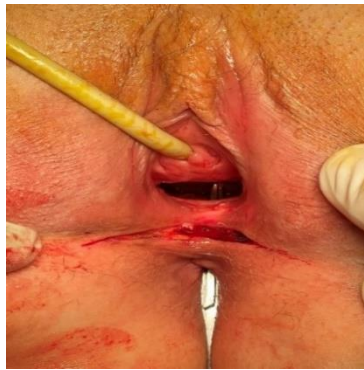
presenting mild symptoms (the patient didn't have any vaccine administrated at that time), for which she was put under conventional therapy which delayed the initial symptoms, followed by an imagistic reevaluation (thoracic CT scan – no significant changes, CO-RADS 1), all this situation imposing a delay of the surgical intervention.

After 4 weeks from the infection with the SARS COV2, respectively 16 weeks from the fecal diversion, it was decided it was safe to reconsider the surgical intervention. It was performed, nonetheless, a preoperative local evaluation (rectal touch, vaginal touch, Lockhart-Mummery sample) which revealed an oversized fistula sphincter (approximately 2.5 – 3 cm) compared to the initial clinic-imagistic examination, which resulted in reclassifying the disease stage to RVF Rothenberger II.

### Operative details

The preoperative procedures for the patients diagnosed with RVF include the clinical examination (Carey test, Lockhart-Mummery test), other paraclinical examination such as panendoscopy/sigmoidoscopy, MRI scan, and in some cases even endoanal ultrasonography (EUS) or bowel cleansing, either by mechanical means or by using medication. The evaluation of the postoperative sexual life quality and the evaluation of the incontinence scale is done by using the Female Sexual Function Index (FSFI) along with the Wexner or Cleveland Clinic Incontinence Score (CCIS).

### Surgical technique



**Figure 1:** Lockhart-Mummert probe. RVF Rothenberger II



**Figure 2:**

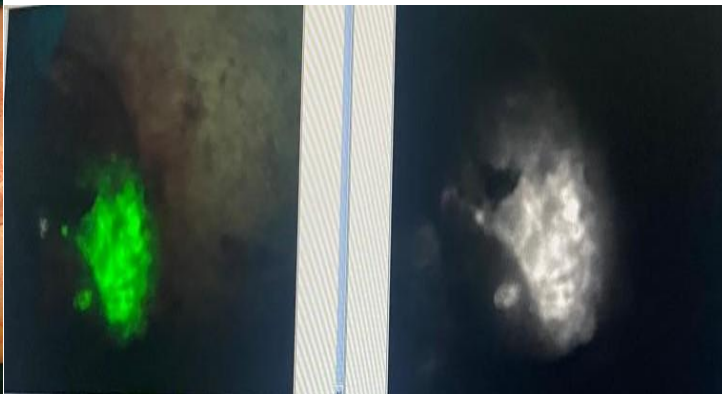
### Operative technique

After a horizontal perineal incision (**Fig. 1**), the rectovaginal space (Tyrel fascia and Proust-Barbillian septum) is mobilized, the fistula is dissected, and the posterior vaginal wall and rectal mucosa are closed with single sutures. Only one operating field is used for RVF repair in the Martius

procedure. After precise measurement (6 cm from the perineum, 45 degrees in an anterior-cranial direction and 8 cm cranially), the second vertical labia majora incision (**Fig. 2**) is made to dissect the posterior pedicled adipose tissue flap. The modified Martius flap is then pivoted dorsally under the ischiocavernosus muscle and sutured without tension in the Tyrel fascia or rectovaginal space to separate vaginal and rectal sutures [24-25].



**Figure 3**



**Figure 4**

**Figure 3-4:** Translocation of the pediculated cutaneous-adipose flap from the paralabial left side to the posterior vaginal wall, followed by its repair using a 3-0 vicryl stitch. The anterior vaginal wall is stitched biplanar using a slow-absorbing 3-0 vicryl stitch.

The intravenous injection of approximately 0.1mg/kg of ICG followed by the examination of the vascularization of the cutaneous-adipose flap.





**Figure 5:** Jackson-Pratt drainage type. Left biplanar paralabial stitch done using a 3-0 slow-absorbing vicryl. Pudental nerve block with postoperative analgesic purpose.



**Figure 6:** Postoperative image after 48 hours.

The time duration of the surgery was of about 140 minutes, no intraoperative or postoperative complications were reported according to the Clavien-Dindo classification. The evolution of the surgical wounds (perineal, respectively pudental ones) was a favorable one as a result of the per primam epithelialization process, without any reporting of local complications. After 72 hours from the surgery, the Jackson-Pratt drain was also removed. The restoration of the continuous bowel transit took place in phase 3 of the therapy process, at about 10 weeks since the repair applying the Martius flap procedure.

The rectal and vaginal permeability was preserved at the normal level, sphincter tonus normal nature, no sign of incontinence according to the Wexner classification, and normal sexual activity according to the FSFI scale (approximately 6 months postoperative the patient went through a progressive vaginal dilation using Frank procedure).

## Discussions

In specialized literature, Pinto et al. outlined a success rate of 87% after a period of 20 months monitorization process for those fistulas treated using unique or combined surgical procedures. Depending on the main disease,

they also outlined success rates of 66% where fistula was caused by obstetrical traumas, 70% where the fistula developed postoperative and 44% where the RVF was caused by the Crohn disease. Moreover, the specialized literature reports a global success rate of 33%-100% for Martius procedure when used in the surgical repair of the RVF, most of the current studies done on this subject being only on small retrospective analysis or different series of cases [26].

In German studies on the RVF treatment, Ommer et al. revised those studies referring to the Martius procedure for RVF repair. Only 7 out of all the cited references analyzed more than 10 patients; those reported primary healing rates of 65% (for patients with Crohn disease) and 75% (for patients not suffering of Crohn disease) to 100%. Most of the studies reported high healing rates using this procedure, highlighting the fact that Martius process (the modified version of it) can be recommended for surgical management of the complex and recurring RVF [27].

Due to the fact that that colostomy is an adequate method to prevent infectious complications at the perineal level which could eventually affect the healing process, especially in the management of the recurring RVFs, it makes valid the possibility to do ostomies (transvers-ostomy, left iliac

colostomy) in the course of the same procedure, as an additional phase in the repairing process of the RVF.

## Conclusions

There are a lot of metrics in the specialized literature that emphasize the versatility and feasibility of the Martius/mMartius procedure regarding the resolution of the RVF located in the lower, respectively median sphere [28]. This metrics are also sustained by the anatomic flexibility of the perineal area regarding the loco-regional vasculature. An important aspect of this procedure is also related to the RVF's etiology, and that is because the local surgical intervention needs to be performed in minimum inflammatory circumstances, when the tissues do not present any tumoral impregnation. Temporal fecal diversion represents a first therapeutic phase thus assuring the ablation of the local inflammatory aspect, while the biopsy performed at the RVF situs level is considered a key preoperative criterion.

## References

1. Reichert M, Schwandner T, Hecker A, et al. (2014) Surgical Approach for Repair of Rectovaginal Fistula by Modified Martius Flap. *Geburtshilfe Frauenheilkd.*;74(10):923-927.
2. Fu, Wenqiang MM<sup>a</sup>; Yi, Sibin MM<sup>a</sup>; An, Mingwei PhD<sup>b\*</sup>; Tang, Yong PhD<sup>b</sup> et al. (2020) Effect of diverting stoma for rectovaginal fistula, *Medicine*: December 4, - Volume 99 - Issue 49 - p e23202
3. Qian Zhou, Zhi-Min Liu, Hua-Xian Chen (2021) - Stapled transperineal repair for low- and mid-level rectovaginal fistulas: A 5-year experience and comparison with sutured repair – *Japanese Journal of Gastroenterology and Hepatology* .
4. Elkins TE, DeLancey JO, McGuire EJ. (1990) The use of modified Martius graft as an adjunctive technique in vesicovaginal and rectovaginal fistula repair. *Obstet Gynecol* ; 75: 727–733
5. Rangnekar NP, Imdad Ali N, Kaul SA et al. (2000) Role of the Martius procedure in the management of urinary-vaginal fistulas. *J Am Coll Surg*; 191: 259–263
6. McNevinMS, Lee PY, Bax TW. (2007) Martius flap: an adjunct for repair of complex, low rectovaginal fistula. *Am J Surg*; 193: 597–599; discussion 599
7. Pinedo G, Phillips R. (1998) Labial fat pad grafts (modified Martius graft) in complex perianal fistulas. *Ann R Coll Surg Engl*; 80: 410–412
8. Rivadeneira DE, Ruffo B, Amrani S et al. (2007) Rectovaginal fistulas: current surgical management. *Clin Colon Rectal Surg*; 20: 96–101
9. Pitel S, Lefevre JH, Parc Y et al. (2011) Martius advancement flap for low rectovaginal fistula: short- and long-term results. *Colorectal Dis*; 13: e112–e115
10. Shaw W. (1949) The Martius bulbo-cavernosus interposition operation. *Br Med J*; 2: 1261–1264
11. Pinto RA, Peterson TV, Shawki S et al. (2010) Are there predictors of outcome following rectovaginal fistula repair? *Dis Colon Rectum*; 53: 1240–1247
12. Kin C, Gurland B, Zutshi M et al. (2012) Martius flap repair for complex rectovaginal fistula. *Pol Przegl Chir*; 84: 601–604
13. Goldaber KG, Wendel PJ, McIntire DD, Wendel GD Jr. (1993) Postpartum perineal morbidity after fourth-degree perineal repair. *Am J Obstet Gynecol* Feb; 168(2): 489–493.
14. Brown HW, Wang L, Bunker CH, Lowder JL. (2012) Lower reproductive tract fistula repairs in inpatient US women, 1979–2006. *Int Urogynecol J* Apr; 23(4): 403–410.
15. Delancey JO, Miller NF, Berger MB. (2010) Surgical approaches to postobstetrical perineal body defects (rectovaginal fistula and chronic third and fourth-degree lacerations). *Clin Obstet Gynecol*. Mar; 53(1): 134–144.
16. Khanduja KS, Padmanabhan A, Kerner BA, Wise WE, Aguilar PS. Reconstruction of rectovaginal fistula with sphincter disruption by combining rectal mucosal advancement flap and anal sphincteroplasty. *Dis Colon Rectum*. 1999 Nov; 42(11): 1432–1437.
17. Khanduja KS, Yamashita HJ, Wise WE Jr, Aguilar PS, Hartmann RF. Delayed repair of obstetric injuries of the anorectum and vagina. A stratified surgical approach. *Dis Colon Rectum* 1994 Apr; 37(4): 344–349.
18. McCall ML. (1963) Gynecological aspects of obstetrical delivery. *Can Med Assoc J* Jan; 88: 177–181.
19. Rivadeneira DE, Ruffo B, Amrani S, Salinas C (2007) Rectovaginal fistulas: current surgical management. *Clin Colon Rectal Surg* 20: 96-101.
20. Sajjadi SG, Hortváth ÖP, Kalmár K. (2012) Martius flap: historical and anatomical considerations. *Eur J Plast Surg*; 35: 711–716.
21. Angioli R, Penalver M, Muzii L et al. (2003) Guidelines of how to manage vesicovaginal fistula. *Crit Rev Oncol Hematol*; 48: 295–304.
22. Elkins TE, DeLancey JO, McGuire EJ. (1990) The use of modified Martius graft as an adjunctive technique in vesicovaginal and rectovaginal fistula repair. *Obstet Gynecol*; 75: 727–733.
23. Rangnekar NP, Imdad Ali N, Kaul SA et al. (2000) Role of the Martius procedure in the management of urinary-vaginal fistulas. *J Am Coll Surg*; 191: 259–263.
24. McNevinMS, Lee PY, Bax TW. (2007) Martius flap: an adjunct for repair of complex, low rectovaginal fistula. *Am J Surg*; 193: 597–599; discussion 599.
25. Pinedo G, Phillips R. (1998) Labial fat pad grafts (modified Martius graft) in complex perianal fistulas. *Ann R Coll Surg Engl*; 80: 410–412.
26. Rivadeneira DE, Ruffo B, Amrani S et al. (2007) Rectovaginal fistulas: current surgical management. *Clin Colon Rectal Surg*; 20: 96–101.
27. Pitel S, Lefevre JH, Parc Y et al. (2011) Martius advancement flap for low rectovaginal fistula: short- and long-term results. *Colorectal Dis*; 13: e112–e115.
28. Shaw W. (1949) The Martius bulbo-cavernosus interposition operation. *Br Med J*; 2: 1261–1264.