

Repair of a rectovesical fistula following laparoscopic radical prostatectomy with Martius fat pad flap interposition: a proposal of a new technique

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ABSTRACT

Rectovesical fistula (RVF) is defined as an abnormal communication between the rectum and the urinary bladder, most commonly after an iatrogenic injury during pelvic surgery. Patients with RVF may have various clinical presentations, ranging from fecaluria, pneumaturia, to urine leakage through the anus. The quality of life for patients with this pathology is adversely affected owing to the associated psychological burden. Surgery is the preferred treatment given the low success rates reported for conservative or minimally invasive approaches. Herein, we present a case of a 65-year-old man with RVF after radical prostatectomy successfully treated by a transperineal approach using a modified Martius procedure.

Keywords: Fistula; genitourinary; Martius; minimally invasive; prostatectomy; rectovesical.

Introduction

Rectovesical fistula (RVF) is defined as an extra-anatomic communication between the rectum and the urinary bladder, and those affected by RVF usually present with fecaluria, pneumaturia, and urine leakage through the anus. RVF represents a rare but severe complication of radical prostatectomy (RP) with a reported incidence of 0.2% (ranging from 0% to 1.5%) in a large systemic review and meta-analysis.^[1]

Although 2.4% of the cases do not require treatment, the mainstay of treatment is surgical, considering the reports of spontaneous healing achieved only by 10% through fecal and/or urinary diversion, antibiotics therapy, and silk line placement.^[2] In this context, several surgical approaches have been described, including perineal, transanal, transanosphincteric, transabdominal, abdominoperineal, laparoscopic, or robot-assisted, but there is no consensus regarding which of these approaches is the optimal cost-effective treatment to perform. Herein, we present the case of an RVF follow-

ing a laparoscopic RP treated by a transperineal approach using a modified Martius fat flap.

Case presentation

A 65-year-old man presented to our department for a scheduled 2-week postoperative evaluation after laparoscopic RP with complaints of pneumaturia. He was afebrile; his medical history was relevant for acute myocardial infarction. A contrast-enhanced abdominal computed tomography (CT) scan was performed, which revealed a fistulous tract between the right posterolateral wall of the bladder and the rectum (Figure 1). Hence, the patient underwent fecal diversion with ileostomy and urinary diversion placing ureteral open-end catheter bilaterally, extracting them through a cystostomic puncture, and configuring a subcutaneous tunnel for the catheters to make them indwelling. In addition, a urethral catheter was placed to optimize the chances for spontaneous closure of the fistula. Three months after the surgery, findings from cystoscopy and a cystogram showed the persistence of the fistulous tract. In light of this, we decided to repair the fistula through a perineal approach.

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The following is the step-by-step procedure (Figure 2):

1. The patient is placed in an exaggerated lithotomy position until the perineum is horizontalized. After the sterile placement of an 18 Fr Foley bladder catheter, an inverted Y-shaped 5-cm incision is made on the perineal median raphe, and the anal sphincter is identified and crossed after the dissection of the tendon center of the perineum (Figure 2a).
2. The space between the urethra, the posterior wall of the bladder, and the anterior wall of the rectum is then developed. The anterior and lateral aspects of the rectum are isolated and followed to locate the defect on the rectum side. This space is further developed to identify the fistula on the bladder side, easily recognized by the presence of the catheter (Figure 2a and 2b). Both the sides of the fistula are then circumscribed and dissected.
3. The bladder and rectum defects are closed separately following a perpendicular line, using, for each side, 2 layers of interrupted sutures with 3-0 monofilament (Figure 2c).
4. A 6-cm length flap of adipose tissue from the interspace between the bulbocavernosus (bulbospongiosus) and ischiocavernosus muscles is isolated and prepared as described in the modified Martius fat pad flap technique.^[3] No further surgical incisions or tunnelization or rotation of the flap is needed, with this fat pad being easily accessible in the male perineum and not covered by the labia major as in the female perineum. To ensure the caudal pedicle of the flap, extreme caution is exercised during the dissection in order to preserve the posterior vascular dipedicle, a branch of the internal pudenda (Figure 2d and 2e).
5. The flap is then interposed between the bladder and the rectum wall and fixed with a single 3-0 monofilament stitch in the deepest part of the rectal bladder space (Figure 2f).

A cystogram and an ileogram performed 1 month after the surgical repair showed no residual fistulous tract. Urethral and ureteral catheters were then removed, and ileal recanalization was performed.

Main Points:

- RVF is a rare but severe complication of RP with a low spontaneous healing rate.
- Typical presentation of RVF includes pneumaturia.
- As a minimally invasive procedure, the Martius procedure has gained popularity for surgical management mainly for rectovaginal fistulas, offering several advantages in fistula repair including low morbidity, the lack of a cosmetic defect, and a single surgical field.
- This technique is safe, feasible, and effective and should be considered also for RVFs refractory to conservative therapy.

At 24 months of follow-up, no recurrence was documented with good urinary continence achieved, using a safety pad per day.

Discussion

Martius procedure for the surgical repair of urethrovaginal fistula was first described by Heinrich Martius in 1928, where the bulbocavernosus/bulbospongiosus muscle was used for reconstruction.^[3] Since then, this procedure and its modifications gained popularity for surgical management mainly for rectovaginal fistulas, becoming over time a more extensively used procedure for the management of perineal defects.^[4] The Martius flap offers several advantages in fistula repair, including low morbidity, the lack of a cosmetic defect, and the need for only a single surgical field.

It enhances the blood supply in the perineal region; in addition to this, its prominent fibrous component makes it a reliable graft more than adipose tissue from other areas. To the best of our knowledge, this type of flap was not used previously in RVF management of male patients.

Generally, the incidence of RVF after RP is low, but taking into account the number of times this procedure was performed per year, this concern becomes a clinically important issue to face.

RVF frequently occurs during posterior-apical dissection, while attempting to develop the plane between the rectum and Denonvilliers' fascia. The reported incidence after RP varies between 0.53% and 9%, and its onset is possible even if there is no finding of rectal injury during the operation.^[5] RVF increases mortality and morbidity rates in patients, inevitably decreasing their quality of life, the length of hospital stay, and the costs involved.^[6] The clinical presentation of RVF relies on the size of the fistula. Common clinical symptoms and signs are fecaluria and/or pneumaturia, associated with frequent voiding, recurrent cystitis, and dysuria. In addition, gastrointestinal symptoms can occur, such as diarrhea, nausea, and watery stool.^[5]

The diagnosis of RVF is confirmed by imaging. In this context, retrograde urethrocytography, urethrocytscopy, and rectoscopy are essential to assess the morphology of involved tissues and determine the best management strategy.^[7,8] Moreover, a CT scan is useful to improve fistula typification. We performed contrast-enhanced CT to visualize the entire anatomy of the urinary system and evaluate preoperative features that cannot be detected by a cystogram alone. Moreover, cystogram findings were reported to be inconclusive in some series of genitourinary fistulas, with a detection rate for enterovesical fistula ranging between 20% and 30% of cases.^[9]

In a systematic review performed by Kitamura et al.,^[5] no study showed a significant difference in the prevalence of rectal in-



Figure 1. a, b. Axial plane (a) and sagittal reconstruction (b) of the CT scan performed by the injection of the contrast through a bladder catheter showing the location of the fistula
CT: computed tomography

jury for any RP procedure, except for a retrospective one, which demonstrated that the risk of rectourinary fistula was 3.06-fold higher for transperineal RP versus retropubic RP.

If a rectal injury occurs and is recognized during the oncologic surgery, the prostatectomy should include the repair of the rectum defect.^[10] To reduce a fistula onset, omentum may be interposed. A well-vascularized pedicle of omentum that will be long enough to reach the pelvic floor should be harvested, dividing the peritoneum in the rectovesical cul-de-sac and feeding the end of an omental pedicle through this opening. The anal sphincter is dilated widely by an assistant, and the rectal injury is delineated. While there is excellent visualization, the edges of the wound are closed in 2 layers. The omental pedicle is immobilized over the repair, with absorbable sutures, and the vesicourethral anastomosis is performed.^[11]

In the case of a postoperative RVF onset that is due to damage by electrocauterization,^[10] conservative management with only urine drainage is proposed with a low success rate. In light of this, a small-diameter RVF is associated with a successful resolution with conservative management in 25%–50% of cases.^[12]

In fistulas refractory to conservative approach, surgery is mandatory. Several approaches to repair fistulas have been

proposed, including transabdominal, transanal, transperineal, posterior rectal, and transvesical, but none of these have shown superiority. Regarding fecal diversion, no consensus has been achieved: some authors consider mandatory fecal diversion as the first step, whereas others consider it only in complicated cases, or when other maneuvers failed, or prior radiotherapy.^[13]

Minimally invasive approaches, including laparoscopic and robotic, have been proposed. Sotelo et al.^[14,15] performed laparoscopic and robotic repairs of rectourinary fistulas after RP with the successful interposition of the omentum on the rectal sutures. These techniques are feasible, but special devices and technical skills are required, and cost-related issues should be taken into consideration.

We decided to introduce in our practice and to propose a modified Martius fat pad flap technique for several reasons. First, it is a cost-effective procedure because it does not involve high-technology instrumentations. This surgical approach has a low morbidity impact for the patient, consisting of a 5- to 6-cm incision at the level of the perineum and thus avoiding a re-entrance of the abdominal cavity. Several variants of transperineal flap interposition have been described in the literature for the management of urogenital fistulas. One of them includes the use of gracilis muscle flap harvested after making an incision on the

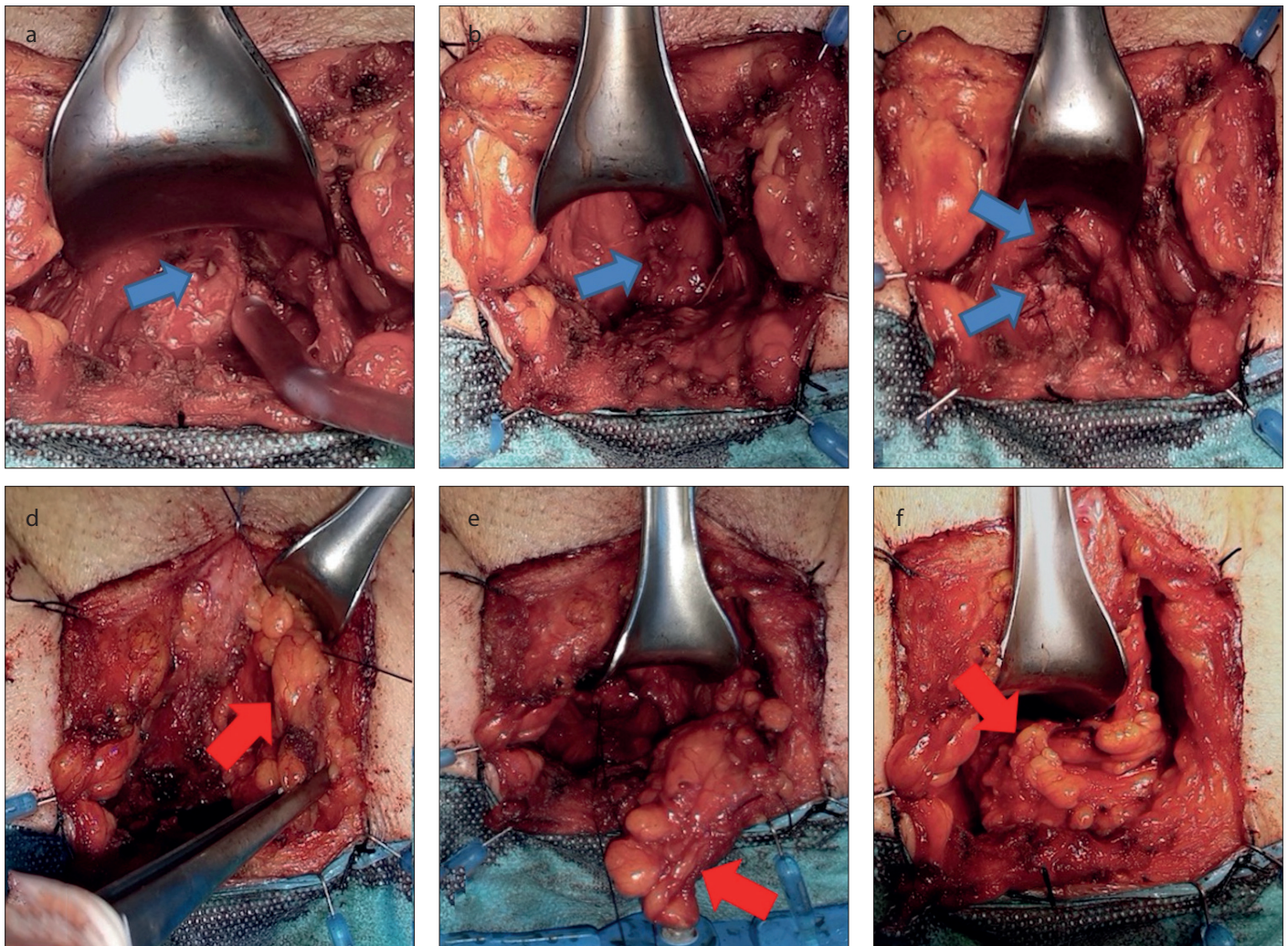


Figure 2. a-f. The Martius fat pad flap procedure for rectovesical fistula repair: (a) an inverted Y-shaped incision is performed along the median perineal raphe, then, crossed the anal sphincter, and the bladder side of the fistula is identified, and the catheter is visualized (blue arrow); (b) rectal tract defect identification (blue arrow), circumscription, and dissection is performed; (c) bladder and rectum defects (blue arrows) are closed separately following a perpendicular line, using interrupted sutures with 3-0 mono-filament; (d and e) a flap of adipose tissue (red arrow) from the interspace between the bulbocavernosus/bulbospongiosus and ischiocavernosus is isolated and prepared; (f) Flap interposition between the bladder and rectum wall is accomplished (red arrow)

medial border of the thigh and then its mobilization till the level of the defects in the perineum.^[16] As this is a good option in the correction of a rectovaginal fistula, we find that our technique neither involves an additional incision nor includes the isolation of any muscle on account of the harvested flap being composed only of fat tissue, thus resulting in a more reproducible procedure.

In conclusion, the Martius procedure is safe, feasible, and effective for the management of RVFs. The transperineal approach provides easy access and identification of fistula and good surgical exposure with good functional results. With the management of RVFs being a therapeutic challenge, it is of utmost impor-

tance that the surgeon has expertise concerning this alternative surgical treatment option.

Ethics Committee Approval: Written informed consent was obtained from who participated in this case.

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