TRANSANAL ENDOSCOPIC MICROSURGICAL TREATMENT OF RECTOVAGINAL FISTULA: AN ORIGINAL TECHNIQUE

D’Ambrosio G¹, Paganini AM¹, Guerrieri M², Lezoche G², Balla A¹, Quaresima S¹, Scoglio D¹, Antonica M¹, Intini G¹, Mattei F¹, Lezoche E¹

¹ Department of Surgery "Paride Stefanini", Endolaparoscopic Surgery and Advanced Technology Unit, (Director Prof. E. Lezoche), Policlinico “Umberto I”, Rome, Italy
² Clinic of General Surgery and Surgery Methodology, Polytechnic University of Marche, Ancona, Italy

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Abstract

**Background:** Rectovaginal fistula (RVF) is a rare surgical condition. Its treatment is extremely difficult, and no standard surgical technique is accepted worldwide. This report describes a new approach by transanal endoscopic microsurgery (TEM) to treat RVF.

**Methods:** A retrospective review of 13 patients who underwent RVF repair by TEM between 2001 and 2008 was undertaken. The surgical technique is described, as well as the advantages of the endorectal approach.

**Results:** Median follow-up time was 25 months and median patients’ age was 44 years (range, 25–70 years). Mean operative time was 130 min (range, 90–150 min), and mean hospital stay was 5 days (range, 3–8 days). One patient experienced RVF recurrence. This patient underwent reoperation with TEM and experienced re-recurrence. Two patients had minor complications (hematoma of the septum and abscess of the septum), which were treated with medical therapy. For two patients, moderate sphincter hypotone was registered.

**Conclusions:** A new technique for treating RVFs by TEM is presented. This approach proved to be feasible and safe, avoiding any perineal incision, which may be painful and it may damage sphincter function.

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**Introduzione:** Le fistole retto-vaginali (RVF) sono una patologia rara di interesse chirurgico. La causa più comune è una lesione ostetrica. Altre cause frequenti sono le malattie criptoghiandolari, le malattie infiammatorie intestinali, la radioterapia pelvica, e la chirurgia del colon-retto correlata a una guarigione parziale di un’anastomosi colorettale o un precedente accesso. La guarigione spontanea è estremamente rara. Tale guarigione si verifica raramente anche dopo confezionamento di una stomia derivativa. Il loro trattamento è estremamente difficile, e non vi è a tutt’oggi una tecnica chirurgica standard universalmente accettata. Gli approcci chirurgici riportati per il trattamento delle fistole retto-vaginali sono transanale, transvaginale, perineale, transaddominale, e tecniche laparoscopiche. Questo report descrive un nuovo approccio al trattamento delle fistole retto-vaginali mediante la microchirurgia endoscopica transanale (TEM).

**Metodi:** E’ stata condotta una review retrospettiva di 13 pazienti (età media, 44 anni range 25-70 anni) sottoposti a riparazione di fistola retto-vaginale con TEM tra il 2001 e il 2008. In nove casi, le fistole retto-vaginali erano già state trattate altrove con una sutura transperineale diretta delle pareti rettali e vaginali e quattro pazienti erano state sottoposte a due o tre precedenti tentativi di riparazione chirurgica con approccio transaddominale o transperineale, o entrambi, e la sutura diretta. Tutte le pazienti erano portatrici di stomia derivativa quando sono giunte alla nostra osservazione. Le fistole si sono verificate come conseguenza di un intervento di isterecotomia transvaginale (N=7), di resezione anteriore bassa con suturatrice meccanica (n=5) e postradioterapia (n=1). La tecnica chirurgica è stata ampiamente descritta, ed i vantaggi dell’approccio endorettale sono noti. L’uso della TEM segue gli stessi principi della chirurgia tradizionale, con i noti vantaggi relativi alla magnificazione della visione e dell’illuminazione. La paziente viene posta in posizione prona sul tavolo operatorio.

**Risultati:** Il tempo operatorio medio è stato di 130 minuti (range 90-150 minuti), e la degenza in ospedale è stata di 5 giorni (range, 3-8 giorni). Una sola paziente ha presentato recidiva di malattia. Questa paziente è stata sottoposta ad un secondo intervento di TEM e ha presentato nuovamente una recidiva. Due pazienti hanno avuto complicanze minori (ematoma del setto e ascesso del setto) che sono state trattate con terapia medica. In due pazienti, si è registrata una modesta ipotonia dello sfintere.
Introduction

Rectovaginal fistula (RVF) is one of the most distressing surgical conditions, physically, psychologically, and socially, that women can experience. Women with this condition feel ashamed and isolated. Obstetric injury is the most common cause.

Other causes include cryptoglandular disease, inflammatory bowel disease, pelvic radiotherapy and colorectal surgery related to partial healing of colorectal anastomosis or previous abscess. Spontaneous healing is extremely rare. RVF healing also rarely occurs after stoma creation. Treatment of RVF is generally considered to be extremely difficult, and various techniques have been advocated.

Primary RVF repair has a success rate of 70–97%, but after one or more unsuccessful attempts at repair, the success rate falls to 40–85% (1). Various surgical and nonsurgical methods of repair are used, and a gold standard procedure is still missing. The surgical approaches reported so far for the treatment of high RVF are transanal, transvaginal, perineal, transabdominal, and laparoscopic techniques of repair (2). The rectal mucosal advancement flap repair is the most popular procedure, with success rates ranging between 60–80%. The nonsurgical approaches are fistulography and application of fibrin glue.

This report describes an original surgical approach using transanal endoscopic microsurgery (TEM) to remove the fistula and the surrounding scar tissue.

Materials and Methods

From February 2001 to December 2008, 13 patients (median age, 44 years; range, 25–70 years) with RVF were treated. In nine cases, the RVF was first treated elsewhere by transperineal direct suture of the rectal and vaginal walls, and four patients had two or three previous surgical attempts by transabdominal or transperineal approach or both, and direct suture. All patients had a diverting stoma at first referral. Fistulas occurred as a consequence of transvaginal hysterectomy (n=7), low anterior resection (n=5), and post-radiotherapy (n=1). All the patients underwent preoperative colonoscopy, X-ray barium enema, endorectal ultrasonography, anorectal manometry, computed tomography (CT), or magnetic resonance (MR) imaging. Preoperative patient preparation included standard mechanical bowel irrigation, antibiotic and thrombosis prophylaxis. Medium distance of the RVF from the anal verge was 7 cm (range, 4–10 cm).

The patient is placed in prone position on the operating table. As compared to traditional surgery, TEM has well-known advantages related to vision magnification and excellent lightning.

The operation includes four steps:

Step 1. After operative rectoscope introduction, the RVF is clearly identified with a Nelaton tube introduced through the vagina or with the use of methylene blue. The vagina is then packed with gauze to avoid carbon dioxide (CO2) leakage (Figure 1).
Step 2. Under three-dimensional TEM vision, the fistula sclerotic tissue is widely excised. The margins of the excision line must be of normal tissue. A conservative approach runs the risk of not removing all the scar tissue and it may lead to unsuccessful outcomes. Dissection in the rectovaginal septum laterally and aborally to the fistula is easily performed with the TEM instrumentation. When dissection of the septum is completed, the TEM instrumentation is temporarily removed.

Step 3. By finger dissection, the surgeon completes dissection of the aboral part of the septum until the sphincter fibers are reached (the oral part of the septum has been previously managed with TEM). For technical reasons this part of the operation cannot be performed by TEM. The dissection of this part of the septum is easy once the correct plane is identified and it carries no risk of bleeding (Figure 2).
Step 4. The operative rectoscope is introduced again, and suture of the vagina edge is performed with three or four stitches to obtain a longitudinal suture. The stitch extremities are left in the vagina to be tied at the end of the operation. Hemostasis is carefully verified, and a transverse suture line is performed on the rectal wall. The patient is placed in the supine position, and a vaginal retractor is introduced. The vagina defect is sutured with introflected edges (Figure 3).

Results
All patients were referred with a diverting stoma. They were able to ambulate on the first postoperative day after TEM. Free oral intake was achieved on the second postoperative day.
Mean operative time was 130 min (range, 90–150 min) and mean hospital stay was 5 days (range, 3–8 days). Analgesics were used only on the first postoperative day. The patients were able to resume their regular activities on postoperative day 10.
Radiologic evaluation performed on postoperative day 10 showed no fistulas. In two cases, the procedure was complicated by hematoma of the septum and abscess of the septum, treated with antibiotic therapy. In two cases, nightly soiling was observed, and anorectal manometry showed a moderate sphincter hypotonia. This functional sequela resolved in 3 months with sphincter re-education.
The median follow-up period was 25 months, with evidence of one recurrence (7%) occurring within 30 days after TEM. The patient had undergone a previous low anterior resection for T3 N1 rectal cancer after neoadjuvant treatment. The recurrent RVF was treated again with TEM, and a re-recurrence was observed after 40 days. At the time of this writing, the patient has maintained her stoma because she has refused any other surgical treatment.

Discussion
Rectovaginal fistulas represent less than 5% of all anorectal fistulas (3). Obstetric injury is the most common cause, occurring in up to 70–88% of cases (2, 4). Other causes include low rectal anterior resections (0.9–2.9%) (2) or vaginal surgery, perianal or Bartholin’s gland infection, radiation proctitis, and inflammatory bowel disease (3). The fistula also may occur as a complication of leukemia or other malignancies.
Several techniques have been developed in the attempt to treat RVFs. In the early 1980s, the endorectal advancement flap (EAF) technique was advocated as the treatment of choice for patients with low rectovaginal fistulas. Initially, the reported results were very promising, with a healing rate of 78-95%. More recently, however, a significantly lower healing rate has been reported, especially after previous recurrent RVF repair (5). In a retrospective review of 105
patients from the Cleveland Clinic Foundation who underwent EAF, 37 had rectovaginal fistulas, and 21 patients (56.8%) experienced recurrences. Thus, the primary healing rate was 43.2%. The authors concluded that "although the EAF continues to be successfully used to treat rectovaginal fistulas, it seems as though our success rate was not as optimistic as some of the other published studies, and has not shown improvement over the past five years" (6).

In the early 1990s, it was suggested that interposition of healthy, well vascularized tissue may be the key to RVF healing. Multiple surgical strategies for transferring healthy non-irradiated tissue have been described. These methods involve the use of skin flaps, muscle flaps, musculo-cutaneous flaps, intestinal flaps, and the Martius flap, including subcutaneous tissue and bulbo-cavernosus-muscle from one of the labia minora (7–19, 20).

The beneficial effect of pubo-rectal sling interposition has been reported, with success rates of 92-100%. In 2006, Oom et al. (5), reporting on a series of 26 consecutive patients, noted a 62% RVF healing rate (16 patients). In patients with one or more previous repairs the healing rate was only 31% compared with 92% after primary RVF repair. Wexner et al. (21, 22) in 2008 used the graciloplasty technique for RVF repair in a group of 15 patients. This method led to a 75% success rate (range, 60–100%), determined by negative prognostic factors such as inflammatory bowel disease and radiation.

Several other methods of treatment for RVF have been used including fibrin sealant instillation, ileal pouch mucosal advancement flap or circumferential pouch advancement, and a proctectomy with colonic pull-through and delayed colo-anal anastomosis.

Buess originally developed TEM in 1983. At the present time this technique is used for the treatment of rectal adenomas and early rectal cancer (T1-T2).

To our knowledge, no series of TEM repair of RVF has yet been reported in the literature. Only three case reports by Vávra (23, 24) and Darwood and Borley (25) have been published.

The main advantage of TEM as an alternative to the flap technique is the use of an endoluminal approach, which eliminates the need of a perineal incision, in contrast to other more invasive techniques. Furthermore, the magnification and three-dimensional view allow for precise identification of the vaginal and rectal surfaces by removal of sclerotic tissue. Consequently, the suture is performed on healthy tissue, which guarantees total control of the hemostasis by magnification of the direct vision. It is also necessary that each of these sutures be performed on different planes, longitudinal and transversal.

Often, RVF is associated with lumen stenosis, especially after surgery and radiotherapy. This may pose an objective difficulty for the performance of TEM with its 4 cm in diameter operative rectoscope. In the current series, however, RVF was never associated with significant lumen stenosis.

The main drawback of the reported technique is that its vision method does not allow for distal dissection of the rectum. Instead, this dissection must be performed digitally and blindly before identification of the avascular plane. Complying with such criteria ensures a high healing rate (93%), higher than with other techniques. The complication rate was 15%. However, complications were minor and resolving promptly with antibiotic therapy.

Nightly soiling was observed in two elderly patients and was resolved within 3 months after surgery with sphincter re-education.

RVF relapse occurred only in one case which was followed by another relapse after redo treatment by TEM. The patient had previously undergone neoadjuvant radiochemotherapy for rectal carcinoma. We believe that such failure is mainly due to a sclerotic process of the tissues (rectum and vagina), with inadequate revascularization. For better results, a long learning curve in the use of the TEM technique with extensive experience in local excision of polyps is essential.

Hence, we advocate that such treatment be performed only in highly specialized centers.

Conclusion

The authors present an original technique for treating RVFs with TEM. This approach avoids any perineal incision, which may be very painful and it may damage the sphincter function.

Disclosures: D’Ambrosio, Paganini, Guerrieri, Lezoche, Balla, Quaresima, Scoglio, Antonica, Intini, Mattei, Lezoche have no conflicts of interests or financial ties to disclose.
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Corresponding Author: Andrea Balla
Department of Surgery "Paride Stefanini", Endolaparoscopic Surgery and Advanced Technology Unit, (Director Prof. E. Lezoche), Policlinico "Umberto I", Rome, Italy
e-mail: info@preventionandresearch.com

Autore di riferimento: Andrea Balla
Dipartimento di Chirurgia "Paride Stefanini", Unità di Chirurgia Endolaparoscopica e Tecnologia Avanzata, (Direttore Prof. E. Lezoche), Policlinico "Umberto I", Roma
e-mail: info@preventionandresearch.com