

# Differentiated surgical treatment of rectovaginal fistulae

## Differenzierte chirurgische Therapie von rectovaginalen Fisteln

### Abstract

**Objective:** Rectovaginal fistulae (RVF) are a serious and debilitating problem for patients and a challenge for the treating surgeons. We present our experiences in the surgical treatment of these patients.

**Methods:** Study population consisted of 22 consecutive patients (range 26–70 years) with RVF treated in our department between 2003 and 2009. 13 RVF were observed after colorectal or gynaecological surgery, 3 occurred after radiotherapy, 2 due to tumour infiltration, 4 because of local inflammation (3x diverticulitis, 1x ulcer simplex recti). The RVF was classified in all patients before treatment as either 'low' or 'high'.

**Results:** Local procedures (transvaginal excision, preanal repair) as initial treatment were performed in 9 patients with low fistula. In 13 cases with high fistula an abdominal approach was performed to close the fistula. A recurrence was observed in 8/22 cases (36%), which were treated by a gracilis flap (n=2), a bulbospongiosus composite (n=1), a second abdominal approach (n=4), and a re-local excision (n=1). Ultimately, in 19 cases the defect healed but in 3 patients the RVF persisted.

**Conclusions:** Most important predictor of healing/failure is etiology followed by localization and recurrence of the RVF. Local (preanal, transvaginal) procedures are suitable for low RVF, whereas abdominal surgery is necessary in high RVF. In recurrent RVF, muscle flaps are promising procedures.

**Keywords:** rectovaginal fistula, preanal repair, gracilis flap, recurrence

### Zusammenfassung

**Hintergrund:** Rektovaginale Fisteln (RVF) stellen für betroffene Patientinnen ein schwerwiegendes psychosoziales Problem dar und bedeuten für den Chirurgen eine komplexe therapeutische Herausforderung. Wir berichten über unsere Erfahrung in der chirurgischen Therapie dieser Patientinnen.

**Methoden:** Wir berichten über 22 Patientinnen (26–70 Jahre) mit RVF, die zwischen 2003 und 2009 in unserer Klinik behandelt wurden. 13 RVF wurden nach colorektaler oder gynäkologischer Operation festgestellt. 3 als postaktinische Folgeschäden, 2 durch Karzinominfiltrationen und 4 durch entzündliche Veränderung aufgetreten (3x Divertikulitis, 1x ulcer simplex recti). Die RVF wurden in tiefe und hohe Fistel unterteilt.

**Ergebnisse:** Initiale Therapie zum Fistelverschluss war bei 9 Pat. durch lokale Exzision/preanal repair, bei 13 Pat. durch einen transabdominellen Zugang. Eine Rezidivfistel war in 8/22 (36%) Fällen nachweisbar. Dann wurde definitiver Fistelverschluss erreicht: 1x lokale Exzision, 4x transabdominell, 2x Gracilis-Plastik, 1x M. bulbospongiosus composite. In 19 Fällen kam es zur Ausheilung des Defektes, bei drei Patientinnen besteht eine Persistenz der RVF.

**Schlussfolgerungen:** Die Ätiologie einer RVF hat den größten Einfluss auf die Heilungsrate gefolgt von der Lokalisation und dem Rezidiv. Bei tief liegenden Fisteln empfehlen wir zunächst ein lokales Vorgehen wie beispielsweise preanal repair und Fistelexzision. Transabdominelles Vorgehen bietet sich bei hoch liegenden Fisteln an. Bei RVF-Rezidiven

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ist an die Interposition eines Muskelschwenklappens (z.B. Gracilis-Plastik) zu denken.

## Introduction

Rectovaginal fistula (RVF) is one of the most distressing surgical conditions that women can experience. Women with this condition can feel ashamed and isolated as they are rejected as a result of malodorous, feculent vaginal discharge and incontinence [1], [2].

The most common causes of RVF are complications of colorectal and gynecological surgery, inflammatory bowel disease, post radiogenic alterations, obstetric trauma, local inflammation, and tumor infiltration [2], [3].

Various surgical techniques such as transvaginal or transanal repair, transabdominal surgery or perineal exploration have been advocated [4], [5]. The treatment of RVF is generally considered to be difficult and often unsatisfactory. Especially in case of recurrent RVF the success rate of the subsequent repair is reduced to 40–85% [6], [7], [8]. One responsible aspect for this high failure rate after surgical treatment is a communication between a septic cavity with a positive pressure (the rectum) and a cavity with a negative pressure (the vagina) [5]. Another reason is the persistence of the etiology (e.g. inflammation, tumor infiltration, granulation tissue). Each subsequent attempt is increasingly stressful for the patient and challenging for the surgeon.

This retrospective study was done to present our experience in the treatment of these patients.

## Material and methods

### Patients

The retrospective study was performed in 22 consecutive patients with a mean age of 54 years (range 26–70) and rectovaginal fistulae (RVF), which were evaluated in the abdominal surgery department of our university hospital between 2003 and 2009. The clinical courses of the 22 patients are summarized in Table 1.

Anonymized informed consent was obtained by all patients. All patients complained of passing faeces and/or flatus via the vagina or recurrent vaginitis before admission. Inclusion criteria were a proven RVF.

Patients with RVF due to inflammatory bowel disease were excluded because a medical treatment as primary treatment is clearly preferred in these patients [9], [10], [11].

The RVF was classified in all patients before treatment as either 'low' or 'high', according to the relation of vaginal and rectal orifice of the fistula to the anorectal junction. Additionally, RVF were classified in every patient as complicated or uncomplicated. A complicated fistula was assumed at severe local sepsis with abscess cavities, granulation tissue.

### Local procedure

A transvaginal approach (Table 1) with excision and repair of the fistula under general anesthesia in the lithotomy position was performed in three patients as previously described [12], [13], [14].

A preanal-repair was performed in 6 cases. All patients were under general anesthesia in lithotomy position. A modified preanal-repair approach with a perineal advancement flap was employed to repair the fistula in all 6 patients. For this procedure a transverse incision was made on the perineal skin, and the recto-vaginal space was separated until presentation of the fistula, reaching far above the level of the fistula up to the peritoneal plica. The fistula was identified and excised. Vaginal and rectal orifices of the fistula were closed with absorbable interrupted sutures. The laminated *levator ani* muscles and submucosal tissue were approximated in the midline with absorbable interrupted sutures. The perineal skin was closed with non-absorbable interrupted sutures.

Bulbospongiosus composite was performed additionally to preanal repair in one patient as previously described [15], [16].

### Gracilis muscle flap interposition

The patients were placed in the lithotomy position. After a perineal incision with left lateral extension (similar to the preanal repair) the RVF was identified. After preparing the fatty tissue the fistula was excised subsequently. The rectal opening and vaginal opening of the fistula was then closed by using absorbable sutures. Now another incision was made at the left medial thigh, the gracilis muscle was identified and secured with a loop. The left gracilis muscle flap was developed after dissecting the tendon from its inserting point at the pes anserinus. Pedicles from the superficial femoral system were ligated and divided. The major pedicle of the medial circumflex artery was localized and carefully preserved. The muscle flap was placed through a subcutaneous tunnel and introduced into the cavity between vagina and pouch, where it was fixed on the levator muscle, on the puborectal loop as well as on the pelvic peritoneum. Tension on the vascular pedicle was meticulously avoided. The donor site in the lower extremity was closed in layers over a suction catheter, and the perineal wound was primarily closed.

### Transabdominal procedure

All 13 transabdominal approaches were performed under general anesthesia in the supine position. In each case, the technique used was individualized according to: the cause of the disease, rectovaginal fistula localisation and ease of access to the fistula. Lower abdominal laparotomy was performed in all cases. The fistula was identified,

**Table 1: Etiology of RVF in 22 patients, with initial treatment and relapse rate**

<b>Etiology of RVF</b>	<b>No. of cases (%)</b>	<b>Initial treatment</b>	<b>Relapse rate (%)</b>
<b>colorectal surgery</b>	n=6 (27.3)		n=3/6 (50%)
low ant. rectum resection (4)		1x transvaginal excision, 2x preanal repair, 1x transabdominal	relapse 1x relapse
proctocolectomy (1)		1x transvaginal excision	relapse
treatment of rectocele (1)		1x transabdominal repair	
<b>gynecological surgery</b>	n=7 (31.8)		n=1/7 (14.3%)
hysterectomy (5)		3x transabdominal repair 2x preanal repair	1x relapse
ovarectomy (1)		1x preanal repair	
obstetric trauma (1)		1x preanal repair	
<b>local inflammation (diverticulitis)</b>	n=4 (18.2)		n=1/4 (25%)
Sigmadiverticulitis (3)		3x transabdominal repair	
Ulcus simplex recti (1)		1x transvaginal excision	relapse
<b>according to tumour infiltration</b>	n=2 (9.1)		
colorectal cancer (2)		2x transabdominal repair	
<b>as a complication of radiotherapy</b>	n=3 (13.6)		
anal cancer (1)		1x transabdominal repair	<b>persisting</b>
cervix cancer (1)		1x transabdominal repair	<b>persisting</b>
endometrium cancer (1)		1x transabdominal repair	relapse

excised and closed with absorbable interrupted sutures. In all cases an omental flap was switched in between the layers.

## Results

In 21 cases, localization of the fistula tract was based on clinical examination, including digital and endoscopic evaluation of the rectum and speculum examination of the vagina. In one case the RVF was not detectable by clinical examination but the patient complained about recurrent vaginitis after gynecological surgery. In this case RVF was detected by computed tomography (CT) after application of rectal and oral contrast agent.

Complications after surgery 13/22 (59%) (colorectal n=6 (46.2%) and gynecologic n=7 (53.8%)) represented the most common etiology of the RVF. In four patients (18.2%) etiology was local inflammation (3x sigma-diverticulitis, 1x foreign body induced rectal ulcer). Two (9.1%) patients with tumour infiltration and three patients (13.6%) after radiotherapy developed a RVF.

Etiology of the RVF, initial treatment of the RVF and relapse rate is presented in Table 1. Two surgical techniques were mainly utilized (Table 1).

**A local repair** was performed in 9 patients. In all three patients with transvaginal excision of the fistula, a recurrent RVF was detectable. The etiology was anastomotic leakage after colorectal surgery in two cases, in one case a foreign body induced rectal ulcer.

Preanal-repair was performed in 6 patients. It was successful in 5/6 (83%) cases. The patient with relapse had an anterior rectum resection because of rectal cancer. After closure of the protective ileostomy a RVF was apparent. A preanal repair was performed. 3 month later another relapse was noticed and a gracilis flap interposition

was performed (Table 2). The other five patients had an uneventful course.

**Transabdominal repair** was the most common procedure (13 patients). In 10 patients because of high RVF in three patients because of complicated low RVF and big abscess formations which were extended in to the abdominal cavity. It was successful in n=9/13 patients (69%). One patient had an abdominal hysterectomy. Patient presented a vaginal cuff infection and abdomino vaginal fistula after surgery which was sutured several times in another hospital. The admission to our hospital was because of a RVF. After a failed transabdominal and a transvaginal approach a gracilis muscle flap was placed. Relapse was noticed three month later. Another abdominal approach was necessary for successful closure of the RVF (Table 2). The other n=3/13 (23%) patients have a persisting RVF because of the underlying disease. That was in one patient an advanced anal cancer. Patient received radiation and chemotherapy and refused oncologic surgical resection. She still has vital tumour in her biopsy and presents severe granulation tissue because of radiation. The second patient had an advanced cervix cancer with neoadjuvant radio-chemotherapy. An anterior exenteration was performed. 4 month after operation patient presented with RVF. An abdominal approach was performed. Because of severe granulation tissue and fibrosis and a big diameter (3 cm) of the fistula the patient presented a recurrent RVF 3 days later. The third patient had an advanced endometrial cancer and neoadjuvant radio-chemotherapy. A transabdominal approach was performed for tumour resection and to close the RVF. Three month later the patient presented with a relapse. A preanal repair was performed and again 6 months later a relapse was noticed. Patient strongly wished further surgical therapy and another abdominal procedure was performed but the RVF is persisting because of severe

Table 2: Patients with recurrent RVF

Etiology of RVF	Initial treatment	1. relapse	2. relapse	3. relapse
low ant. resection	transvaginal excision	preanal repair*		
proctocolectomy	transvaginal excision	transvag. exc.	preanal repair	gracilis flap
ulcus simplex recti	transvaginal excision	transvag. exc.		
low ant. resection	preanal repair	gracilis flap		
abd. hysterectomy	transabdominal repair	transvag. exc.	gracilis flap	transabd. repair
endometrium cancer	transabdominal repair	preanal repair	transabd. repair	<b>persisting</b>

\* This patient had a Bulbospongiosus composite because of scar tissue.

fibrosis and granulation tissue after radiation. These three patients have a permanent colostomy. The other patient listed in Table 1 with abdominal approach had an uneventful course.

Patients who developed RVF after colorectal surgery (n=6) had the highest rate of relapse (n=3/6) 50%. An association between relapse rate and type of anastomosis (hand sewn n=4/6, stapled n=2/6) was not detectable.

In both groups (transabdominal and local repair/preanal repair) a primary closure of the RVF was detected in 14/22 (64%) cases. A recurrent fistula was observed in 5/22 cases (22%), and the RVF persisted in 3/22 (14%) cases. Successful treatment of the first relapse was achieved in 3 (60%) of 5 cases (Table 2).

Mean body mass index (BMI) was 25.13; mean BMI in patients with recurrent RVF was 22.4. The mean duration of fistula presence was 20 months. A 100% success rate was reached after an average of 1.4 (range 1–4) procedures per patient. The overall success rate per patient was 86% after multiple procedures with a mean follow-up of 22 months.

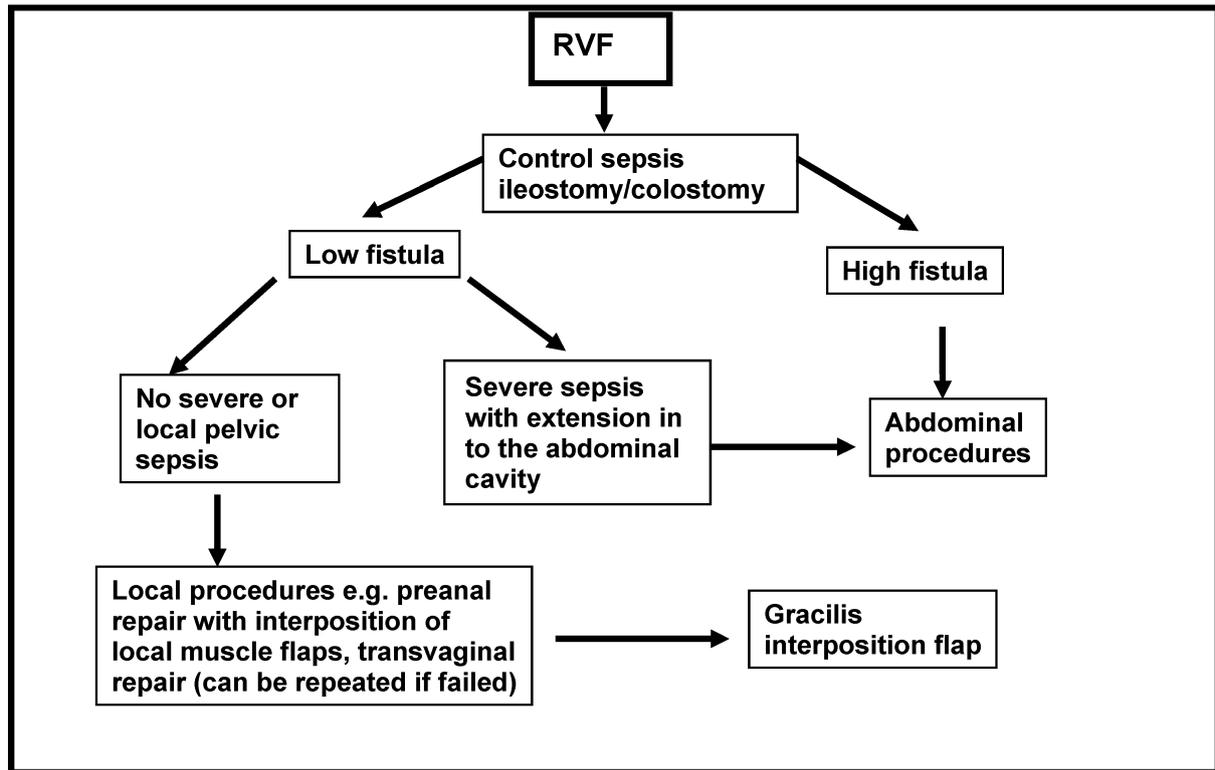
## Discussion

There is controversy regarding the approach in the treatment of rectovaginal fistulae. A variety of surgical procedures has been advocated, including abdominal, transvaginal, transanal [17], [18], transsphincteric [19] and perineal approaches. However, in our opinion, treatment of RVF should depend on aetiology and localization. In our institution the classification of RVF is 'high' or 'low', depending on the fistula's relation to the anorectal junction and complicated (local sepsis with extension in to the abdominal cavity, severe granulation tissue) and uncomplicated simple RVF. This may indicate the type of treatment needed (Figure 1). Local procedures like transvaginal or preanal repair are appropriate for a low fistula. Abdominal procedures should be considered for high fistulae. In cases of low fistulas with abscess cavities and granulation tissue which cannot be completely removed locally, long strictures, or gross sepsis/edema, laparotomy may be the treatment of choice. Completely excision of granulation tissue and fibrotic tissue is required and the defect is to be closed. Any local repair in the presence of chronic sepsis, abscess cavity, granulation tissue after radiation and inflamed tissue is likely to fail in terms of both healing and function. In three patients

with low fistulae the initial treatment was a transvaginal closure. All three patients required more than one attempt for complete closure. Regardless of these results we can recommend this procedure. The advantage of this approach is that it is technically easy with a good exposure. The vaginal blood supply is good, further injury to the sphincters is avoided, the procedure can be repeated. A concern is that it is undertaken from the low-pressure side, the higher pressure being on the rectal side, and there is a possibility of dyspareunia [15], [20], [21]. Hematoma is a common complication because of the vascularity of the vagina [22]. Furthermore the genesis of the RVF which was an anastomotic leak after colorectal surgery in our series couldn't be repaired with this approach sufficiently and the recurrence is preassigned if the origin is not eliminated completely. Preanal-repair offers various advantages, including: no vaginal wound is created; no anal deformity is produced (which can occur after endorectal flap); no sphincter division is required; the technique incorporates a layer of intact tissue; exposure is high; there is wide mobilisation of the flap with an adequate blood supply and without tension; and only minor morbidities have been described. This approach offers a good treatment option as well as a RVF which is primary originated from the vagina or from the rectum. In the present series, the treatment was successful in 5 of 6 (83%) cases after primary repair.

In patients with a history of previous failed advancement flaps, local scarry tissues are inadequate for a new advancement flap-repair, Interposition flap procedures (gracilis muscle interposition) are ideal when an abdominal procedure is contraindicated and when fistulation recurs after multiple local attempts at repair and fibrosis is not severe.

Fistulas following radiotherapy of uterine or rectal cancer present special problems. Because of the depressed response of connective tissue, direct repair can seldom be carried out. Repair can only be achieved by carefully planned operations where non-irradiated tissue is used to close the defect [23], [24]. In our study in three patients the aetiology of RVF is from radiotherapy and in all three cases the RVF is persisting. These patients have a permanent colostomy. Seeing, that these patients have an advanced tumour (in our series all three patient were in a palliative situation) it must be given much consideration before performing sophisticated operations with high morbidity rate. The highest rate of recurrent RVF was seen after colorectal surgery (n=6; relapse rate n=3/6



**Figure 1: Algorithm for treatment of (recurrent) RVF**

The first priority is sepsis control. Next the type of fistula, high or low should be determined and complicated and uncomplicated. In the case of a high fistula, an abdominal procedure should be performed. In the case of low fistula the course of therapy depends on the presence or absence of pelvic sepsis. If there is no severe pelvic sepsis, local procedures should be carried out. In the case of recurrence, gracilis interposition flap should be performed. (Modified from [25]).

(50%). An association between the type of anastomosis (manual or stapler) was not seen.

An association between BMI or age of the patient and the relapse rate was not detected in our series. The unsuccessful treatment with relapse in the present series however can be attributed to unresolved inflammation, infection, haematoma in the scar, suture tension or underlying disease (such as radiotherapy/tumour infiltration). If the etiology of the fistula is eliminated completely, there is a big chance for successful treatment. However eliminating the etiology is the most challenging factor in the treatment of these patients. The algorithm mentioned above is the treatment of choice at our institution at present.

In conclusion predictors of healing/failure are etiology, localization and recurrence of the RVF. Local (preanal, transvaginal) procedures are suitable for low RVF, whereas abdominal surgery is necessary in high RVF. In recurrent RVF, muscle flaps are promising procedures.

## Notes

## Competing interests

The authors declare that they have no competing interests.

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