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IUJ VIDEO

# Interposition of the mesorectal flap as prevention of rectovaginal fistula in patients with endometriosis

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## Abstract

**Introduction and hypothesis** Endometriosis is a gynecological condition characterized by endometrial tissue outside of the uterus. It affects up to 15% of women of reproductive age. In the case of bowel infiltration, about 90% of lesions are localized on the sigmoid colon or the rectum and may interfere with bowel function. Three surgical approaches are possible: (1) shaving technique, (2) discoid resection of the nodule, and (3) segmental resection with end-to-end anastomosis. A rectovaginal fistula is feared as a postoperative complication mainly in simultaneous resection of the vaginal and the rectosigmoid nodules. Its prevention is a two-step surgery (the first operation on the vagina and the second on the colon) or a preventive colostomy, both of which are often thought to be too invasive for a benign condition. Herein, we suggest a one-step surgery to prevent its development.

**Methods** In three women, a concomitant laparoscopic resection of the vaginal and rectosigmoid endometrial nodule was completed with interposition of a mesorectal flap.

**Results** All surgeries were uncomplicated with no rectovaginal fistula in the postoperative period.

**Conclusion** In the hands of skilled surgeons, this one-step technique can be used to prevent rectovaginal fistula development.

**Keywords** Bowel endometriosis · Vaginal endometriosis · Rectovaginal fistula · Mesorectal flap

## Introduction

The management of intestinal deep-infiltrating endometriosis (DIE) lesions may be pharmacological and/or surgical. There are three main surgical approaches to endometriosis of the rectosigmoid colon. These are the shaving technique, discoid resection and segmental resection with end-to-end anastomosis. These procedures can be associated with some complications such as rectovaginal fistula, anastomotic leakage, intraperitoneal infection, and bladder or bowel dysfunctions. One of the most debilitating complications is the rectovaginal fistula, which develops in up to 10% of women [1]. The rectovaginal fistula usually develops after concomitant resection of vaginal and rectosigmoid nodules at the area of the two suture lines. Prevention of rectovaginal fistula formation is carried out by either a two-step surgery (vaginal wall resection followed by rectosigmoid resection) or a preventive colostomy. Another possibility is insertion of the omental flap between the sutures on the vaginal and intestinal wall. Unfortunately, this is sometimes not an easy procedure because of difficulties in releasing sufficient omentum.

We present another option which involves the interposition of the mesorectal flap. The so-called "mesorectum" is a surgical and radiological term for part of the mesentery surrounding the rectum. It begins at the rectosigmoid junction where it blends with the connective tissue of the sigmoid mesentery

**Prior presentation** This technique was presented at the 2018 European Endometriosis Conference in Vienna, Austria.

**Electronic supplementary material** The online version of this article (https://doi.org/10.1007/s00192-019-04030-8) contains supplementary material. This video is also available to watch on http://link.springer.com/. Please search for this article by the article title or DOI number, and on the article page click on 'Supplementary Material'.

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and extends to the end of the rectum at the levator ani muscle. It encloses the rectum and is limited superficially by the mesorectal fascia. The mesorectum contains: perirectal fat, the superior rectal artery and branches, superior rectal vein and tributaries, lymph nodes and vessels.

The mesorectum can be surgically separated from the rectum and preserved. This is called "limited" recto/sigmoideal resection. The anatomical location allows easy interposition between the two sutures.

## Materials and methods

This procedure was carried out in three nulligravid women (25, 28 and 32 years of age) with similar conditions. They presented with dysmenorrhea, dyschezia and dyspareunia with visual analog score (VAS) > 6 for all symptoms. All of them were also planning pregnancy. To determine the extent of the disease, they underwent transvaginal ultrasound and magnetic resonance imaging. DIE nodules in all the women affected both the rectal and vaginal walls. The rectal nodules were 32, 38 and 45 mm large with a distance from the anal verge of 6, 8 and 9 cm, respectively. Based on their subjective complaints and clinical findings, surgical resection of the affected vaginal wall and rectosigmoid colon with an end-to-end anastomosis was chosen. The procedure and possible complications were explained in detail. All the women agreed and signed a written consent.

Surgery was carried out with two experienced laparoscopic surgeons (a gynecologist and a general surgeon). The laparoscopy was performed in the Trendelenburg (Lloyd-Davies) position. Following abdominal cavity insufflation via the umbilical port (10 mm, $CO_2$ gas, 12 mmHg), the laparoscope and three additional ports (5 mm) were inserted in the abdominal cavity suprapubically in the left and right hypogastric region. The surgical procedure was started by the gynecologist. Initially, both adnexae were fixed anterolaterally to the abdominal wall for better accessibility. Thereafter, the sigmoid colon was dissected from the lateral and posterior wall of the abdominal cavity, and both ureters and hypogastric nerves were visualized.

Perioperatively, endometriotic nodules were identified in the vaginal as well as the rectosigmoid wall. First, the affected vaginal wall was sharply resected with a monopolar cautery hook and closed with an interrupted polyglactin 910 suture. The integrity of the vaginal wall suture was confirmed on transvaginal palpation. In all the women, the vaginal suture was > 3 cm long. Second, the colorectal surgeon dissected the mesocretum and adipose tissue and released the rectosigmoid (Figs. 1 and 2). Afterwards, the suprapubic 5-mm port was replaced with a 12-mm port. A linear stapler was used to perform the intestinal resection. The proximal side of the intestine was exteriorized through a correspondingly wide (3–5 cm) suprapubical incision, which was the enlarged incision for the 12-mm port. Extra-abdominally, the affected part of the intestinal wall was resected with a monopolar cautery, the anvil of the circular stapling device (29/33 mm) was inserted into the descending colon, and this complex was returned into the abdominal cavity. The suprapubical incision was closed in layers with continous sutures. The intestinal anastomosis was carried out laparoscopically with the circular stapling technique (Figs. 3 and 4). Suture integrity was tested for water tightness.

The mesorectal flap was constructed from the left mesorectum (Figs. 2 and 3). It was mobilized and cut at the level of the distal resection line of the rectum. This vascularized flap was rotated and inserted in between the sutures on the rectum and vagina. The flap was then fixed with an interrupted 2/0 polyglactin 910 suture approximately 2 cm caudally to the vaginal clousure (Figs. 5 and 6).

## Postoperative follow-up

The women had follow-up consultation with the attending gynecologist and surgeon 3 months postoperatively. All of them recovered uneventfully, had a short hospital stay and at 3 months reported VAS between 0 and 2 for all preoperative complaints. There were no gastrointestinal complications or rectovaginal fistula development.

## Discussion

A fistula is an abnormal communication between two epithelialized surfaces. The rectovaginal fistula develops between the rectum and the vagina. There may be low or high

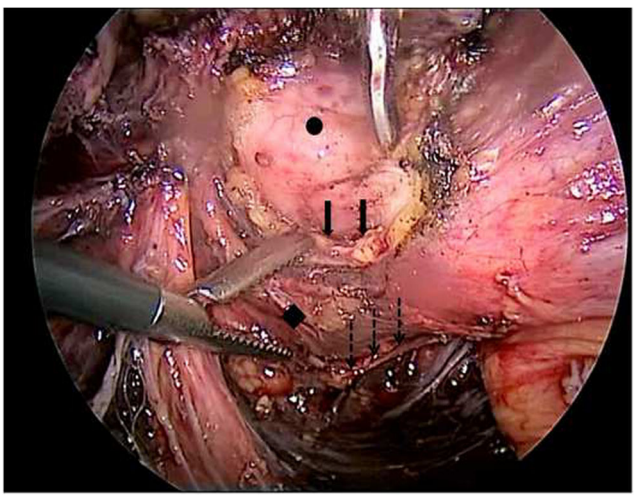

**Fig. 1** Comparison of dissection planes for the standard (dashed arrow) and limited (full arrow) resection of the rectum (•). During the limited resection, the mesorectum (♦) is kept in place

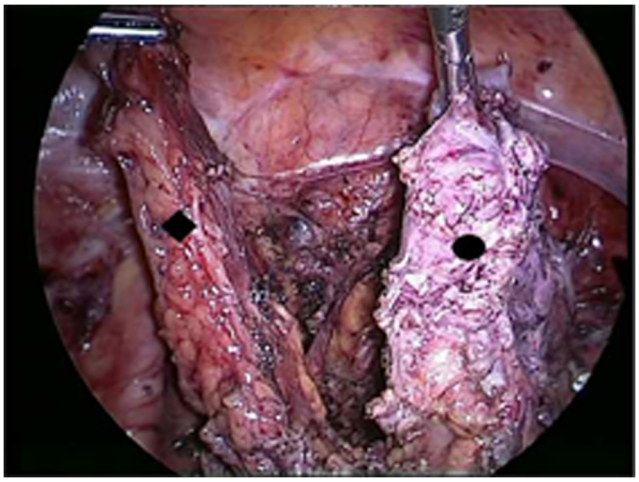

**Fig. 2** Separated rectum (•) and mesorectum (♦). The DIE nodule is visible on the anterior wall of the rectum

fistulas. The low type is between the lower third of the rectum and the lower half of the vagina. The high fistula is located between the middle third of the rectum and the posterior vaginal fornix. They can be also classified according the diameter: small < 0.5 cm, medium 0.5–2.5 cm and large > 2.5 cm [2]. The occurrence of RF after surgery for DIE varies from 2 to 10.6% [1, 3]. Women affected by rectovaginal fistula after endometriosis surgery can experience malodorous vaginal discharge, fever and/or lower abdominal pain, all of which slow postoperative recovery. Repair of this fistula is almost always indicated. This increases the length of the in-hospital stay and affects the medical cost negatively. Rectovaginal fistula is usually diagnosed between 5 to 16 days postoperatively [1]. Spontaneous closures are rare. The mainstay of treatment is surgical correction, which can be transanal, transperineal, transvaginal or transabdominal. Surgical approach and

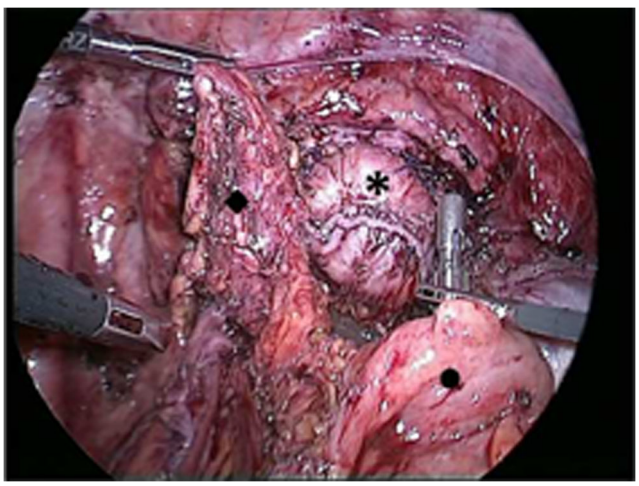

**Fig. 3** The affected part of the rectum was removed, the aboral part of the rectum (∗) was closed with the stapler, and the anvil of the circular stapling device was placed in the oral part of the rectum (•). The mesorectum (♦) is kept for later use as an interposition between the vaginal and rectal suture

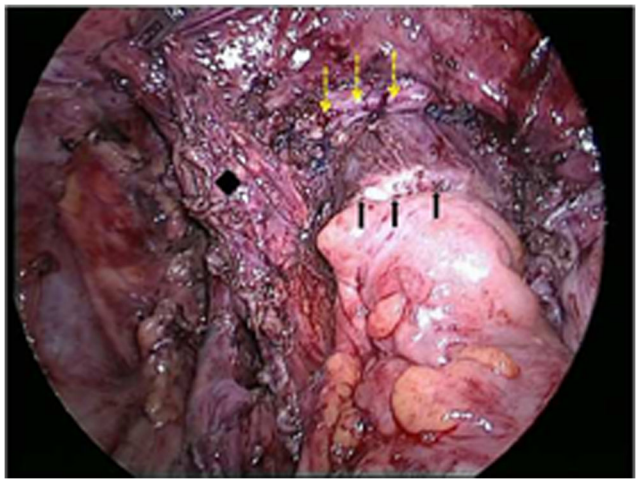

**Fig. 4** The continuity of the rectum was renewed; the suture lines of the rectum (full arrow) and of the vagina (dashed arrow). The mesorectum (♦) is prepared to be sutured between them

success rate depend on the fistula location, quality of surrounding tissue, history of surgical repairs and degree of incontinence [4].

Various risk factors were identified such as vaginal and cul-de-sac DIE lesions [1], concomitant resection of the vaginal and intestinal lesion [5], excessive electrocoagulation, postoperative abscess or necrosis on the posterior vaginal cuff [6], DIE lesion < 5–8 cm from the anal verge [7] or lesion > 4 cm [1]. There is no consensus on the surgical approach to DIE treatment yet. One option is conservative surgery (shaving technique and disc resection), which may be more suitable for intestinal endometriosis. Another option is radical surgery (segmental resection with end-to-end anastomosis), which substantially improves quality of life but is associated with a greater risk of postoperative complications [8]. Complication rates following shaving, disc resection and segmental resection were 6%, 23% and 38%, respectively [9, 10]. Key to

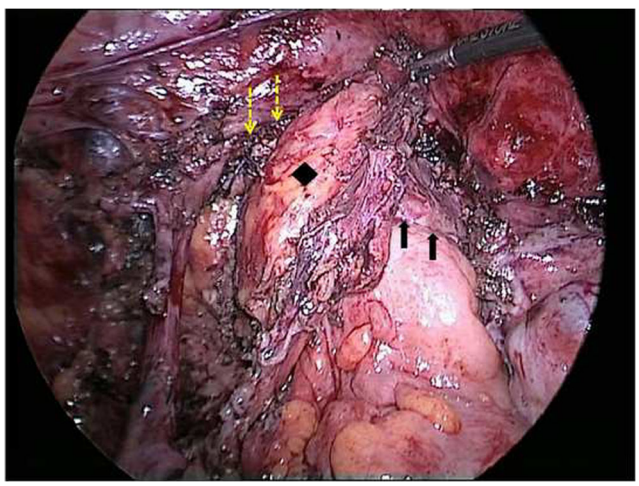

**Fig. 5** The mesorectum (♦) is placed between the vagina and the rectum and secured with several interrupted sutures. Both suture lines are visible (rectum, full arrow; vagina, dashed arrow)

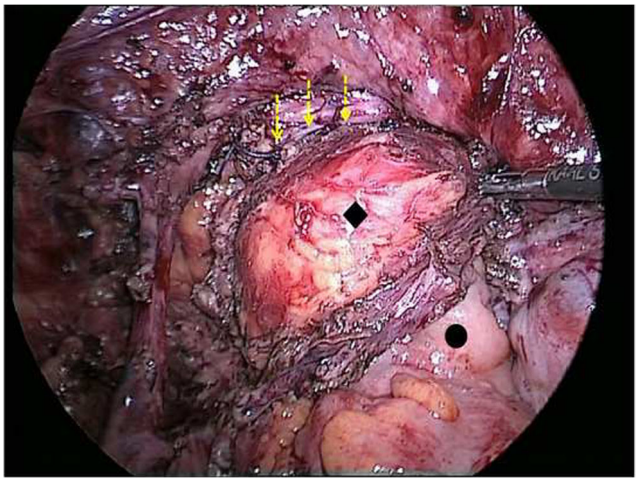

**Fig. 6** Final position of the mesorectum (♦). The rectum (•) and suture line on the vagina (dashed arrow)

successful surgery are the laparoscopic skills of the surgeon, including the colorectal resection and DIE [6].

Prevention of the rectovaginal fistula formation is either a two-step surgery (vaginal wall resection followed by rectosigmoid resection), which is difficult for the patient physically and mentally and is time-consuming, or a preventive ileo-colostomy. According to some surgeons, the temporary colostomy is too invasive for a patient with a benign condition and again with the necessity of a second surgery. Currently, some gynecologists and studies challenge the effectiveness of establishing preventive stoma. They propose insertion of the omental flap between the sutures on the vaginal and intestinal wall. Unfortunately, this is sometimes difficult because of the small size of the omentum or difficulties to sufficiently release it.

## Conclusion

This is an adaptation of a classical onco-surgical procedure, which includes resection of the left colon (sigmoid, rectosigmoid and rectum) but preserves the mesosigmoideum or mesorectum, respectively. A preserved "mesorectal" flap can be used in women who require a concomitant rectal and vaginal resection of DIE. Undamaged vessels and less affected nerves create good quality tissue that can prevent the formation of the rectovaginal fistula between the two sutures. This "mesorectal" flap can be used by surgeons experienced in surgery for deep-infiltrating endometriosis. Importantly, this surgery is currently carried out only in a limited number of women and by experienced laparoscopic surgeons. To justify the procedure, more observations and objective data are needed.

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## Compliance with ethical standards

**Conflicts of interest** None.

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**Consent** Written informed consent was obtained from the patient for publication of this case report and any accompanying images.