

Urological and colorectal complications following surgery for rectovaginal endometriosis

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Objectives To report the short- and medium-term complications of laparoscopic laser excisional surgery for rectovaginal endometriosis.

Design Retrospective cohort study.

Setting University teaching hospital, UK.

Population A total of 128 women with histologically confirmed rectovaginal endometriosis who underwent laparoscopic laser surgery between May 1999 and September 2006.

Methods Women were identified from operative database, and a case note review was performed. Data for surgical outcome and surgical complications were collected.

Main outcome measures Rates of urinary tract and colorectal complications.

Results A total of 128 women underwent surgery. Of these, 32 required intraoperative closure of a rectal wall defect, including 3 segmental rectosigmoid resections. There were three rectovaginal fistulae and one ureterovaginal fistula. Ureteric damage occurred in two women, and five women suffered postoperative urinary retention. The risk of intraoperative bowel intervention was increased in women who complained of cyclical rectal bleeding.

Conclusion Laparoscopic laser excision of rectovaginal endometriosis is a safe procedure with similar, if not lower, complication rates to other published surgical series.

Keywords Complications, endometriosis, rectovaginal, surgery.

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Introduction

Endometriosis is characterised by the presence of glandular and stromal tissues in areas outside the uterus. It has been considered for decades as the result of the implantation of retrograde menstruated endometrial cells¹ (Sampson's theory) or as metaplasia^{2,3} induced by menstrual debris or as lymphatic spread.^{4,5} It occurs most frequently in the pelvic organs and peritoneum and is prevalent in 2.5–3.3% of women in the reproductive age.

Rectovaginal endometriosis accounts for 5–10% of women with endometriosis and is increasingly becoming recognised as a separate clinical syndrome from the superficial form of the disease.⁶ It is characterised by the presence of palpable endometriotic nodules deep in the connective tissue of the pelvis, which show profound fibrosis and fibromuscular hyperplasia. Women with this form of the disease usually have severe symptoms, and there are significant risks of urinary tract and bowel involvement.

Medical therapy, which has been shown to be effective in the symptomatic treatment of superficial disease, has little effect on deep rectovaginal endometriosis.^{7–9} Surgery for rectovaginal endometriosis can be complex and challenging and often involves a multidisciplinary team (MDT). The choice of surgery will depend to some extent on the reproductive plans of the women as well as the surgical skill available. Many authors, us included, advocate the complete dissection and surgical removal of the affected tissues.^{10–13} There is, however, no consensus as to the best way of achieving this and many differing approaches have been described,^{10,11,14,15} none of which has been accepted as 'best' practice. The main area of uncertainty is how to treat the affected bowel. One approach is conservative, with partial or complete excision of the endometriotic lesion without rectal resection. Other authors advocate a more radical approach involving segmental rectal resection. To help develop a consensus regarding the ideal surgical approach, it is essential to closely monitor the efficacy and complications of different surgical approaches.

The purpose of this study is to report the outcomes of a series of women with rectovaginal endometriosis undergoing conservative excisional treatment by a MDT of gynaecologists and colorectal surgeons.

Methods

A retrospective analysis of all women undergoing laparoscopic surgery for complex rectovaginal endometriosis between May 1999 and September 2006 was undertaken. Eligible women were identified from operative databases and by examining case notes. The study cohort was restricted to women with histological confirmation of rectovaginal endometriosis characterised by endometrial-like glands and stroma surrounded by much fibrosis and smooth-muscle hyperplasia in the rectovaginal septum.

All women were extensively counselled about the risks of surgery, which was undertaken without hormonal pre-treatment. Preoperative patient assessment depended on symptoms. All women underwent vaginal and rectal examination performed preferentially at the time of menstruation. If there was a significant history of dyschezia or menstrual rectal bleeding, then magnetic resonance imaging and/or barium enema study were performed. In cases of ureteric involvement with hydronephrosis, ureteric stents were inserted prior to surgery. A significant proportion of women had been referred for tertiary care following laparoscopic assessment by another gynaecologist.

All women had 24 hours bowel preparation. Surgery was carried out using a carbon dioxide laser. The surgical technique began with lysis of adhesions, drainage and stripping of ovarian endometriomas and identification of both ureters in the pelvic sidewall. Both pararectal spaces were identified and opened below the extent of the disease to isolate the endometriotic nodules. The nodule was then dissected away from the bowel until healthy tissue was reached, and finally, it was dissected free from the rectovaginal septum, including an excision of the vaginal vault if necessary, which was then closed laparoscopically. All specimens were sent for histological examination.

Rectal wall defects resulting from excision of lesions extending into (partial) or through (full thickness) the muscularis propria of the rectum were closed laparoscopically in two layers with vicryl sutures. At the end of the procedure, meticulous haemostasis was achieved, and the integrity of the bowel was checked by an underwater air leak test, supplemented in the later part of the series by installation of Betadine into the rectum to look for suture line leakage.

All cases were recorded on either VHS video, CD-ROM or DVD. Women received a completed copy of the recording.

The following data were retrieved from the surgical database: age, preoperative symptoms, operative approach, type of rectal surgery, histopathology, operative morbidity and

mortality, hospital stay duration and follow-up period. Descriptive statistics were calculated and tabulated.

Results

Patient demographics

From May 1999 to September 2006, 495 women with severe revised American Fertility Society stage IV endometriosis were identified. A total of 128 women had histological confirmation of rectovaginal endometriosis, and this formed the study cohort. The mean age of women was 32 years, with a range of 22–47 years.

Symptoms

Presenting symptoms were available for 104 women and are described in Table 1.

Surgery

The mean operating time was 106 minutes (range 35–240 minutes). This did not alter over the period of the study, with the mean operating time of the first half of the study 105 minutes (35–240 minutes) and the second half 109 minutes (60–240 minutes).

All cases were undertaken laparoscopically, and no women required intraoperative conversion to laparotomy. Three women required a mini extension of one lateral port site to remove the specimen and to facilitate a stapled anastomosis following bowel resection. A rectal wall defect required suture closure in 32 women (25%), in 17 women (14%) to repair a full-thickness defect and in 15 women (11%) a partial defect of the muscularis. One woman required resection of a segment of rectosigmoid colon due to extensive full-thickness disease and the presence of diverticulitis, and two women required segmental rectosigmoid resection due to the presence of a circumferential lesion.

The surgery was carried out by gynaecologists with assistance from colorectal surgeons when required (Table 2).

Risk of bowel surgery versus symptoms

The risk of bowel intervention was increased in women with cyclical rectal bleeding. A full-thickness rectal wall defect required closing in 9 of 17 women (53%) with cyclical rectal bleeding compared with 7 of 87 (8%) women without cyclical rectal bleeding. A partial-thickness defect required closing in

Table 1. Symptoms

Dyspareunia	77 (74%)
Dysmenorrhoea	81 (78%)
Dyschezia	40 (38%)
Rectal bleeding	17 (16%)

Table 2. Type of surgery

	Gynaecologist only	Gynaecologist and colorectal surgeon
Complete discoid resection with no involvement of the muscularis	96	0
Complete discoid resection with repair to muscularis	15	0
Enterotomy required for complete excision	14	3
Laparoscopic segmental bowel resection	0	3

8 of 17 women (49%) with cyclical rectal bleeding compared with 7 of 87 (8%) women without cyclical rectal bleeding (Table 3). In no patients was a colostomy created electively.

Complications

Minor postoperative complications occurred in five women (3.2%). All five suffered postoperative urinary retention believed to be related to trauma to the parasympathetic plexus resulting in temporary denervation of the bladder, which was managed with urinary catheterisation for a maximum of 7 days.

Major complications occurred in four women (3%). Two women developed rectovaginal fistulae, which presented on days 5 and 7 after the day of surgery. Both were managed by exploratory laparotomy and creation of a temporary diverting loop colostomy, and a third woman who developed both a rectovaginal and ureterovaginal fistula requiring a temporary colostomy and re-implantation of the ureter. Ureteric damage requiring radiological stenting occurred in one woman. The mean hospital stay was 3.4 days (range 1–11 days).

No women required further surgery as a result of complications related to the closure of bowel defects or bowel resection. The complications were not related to a particular surgeon. Summary of complications is shown in Table 4.

Table 3. Effect of cyclical bleeding on surgical outcome

	Cyclical rectal bleeding	No rectal bleeding	P value (chi-square test)
Partial-thickness defect	8/17 (49%)	7/87 (8%)	<0.001
Full-thickness defect	9/17 (53%)	7/87 (8%)	<0.001

Table 4. Complications

Urinary retention	5 (3.9%)
Ureteric damage	1 (0.8%)
Rectovaginal fistula	3 (2.3%)
Uretovaginal fistula	1 (0.8%)

Outcomes

In 56 women who were followed up locally, we have long-term follow up between 6 and 48 months. Seven women (12.5%) reported that their symptoms have been cured, 41 women (73%) reported that their symptoms have been significantly improved and 8 women (14%) reported that they were no better or worse. No patients' symptoms deteriorated after surgery as shown in Table 5.

Discussion

Laparoscopic complete excision of endometriosis offers long-term pain relief in most women and results in a low rate of minimal persistent/recurrent disease.^{16,17}

Since endometriosis is a benign disease, which affects younger women, knowledge of associated risks and postoperative morbidity for this kind of surgery is important. There are few papers that have previously specifically addressed the risks of surgery.¹⁸

The surgical excision of rectovaginal endometriosis varies from incomplete discoid excision to anterior resection, using electrosurgery, laser excision or circular staplers. These techniques were developed over the past decade reflecting to some extent personal taste and availability of equipment. Whatever technique is used, we believe it is important to have an accurate record of the complication rate associated not only with the technique but also with the centre carrying out the surgery. It is only with this information that proper informed consent can be obtained for this complicated surgery.

In our series to date, it is not yet clear how to be more accurate in predicting the major complication of fistula formation. In two out of three women, the area of bowel involved was extensive without being fully invasive, and this may be a significant finding. The complete video recording of all surgical procedures has allowed not only us but also others to review the surgery. In none of the three women in whom a fistula occurred was the bowel opened due to a full thickened

Table 5. Follow up

Cured	7 (12.5%)
Significantly improved	41 (73%)
No better/worse	8 (14%)
Worse	0 (0%)

Table 6. Cases that resulted in fistula formation

Case	Bowel mucosa opened	Bowel muscularis repaired	Vagina opened	Possible preventative action
1	No	Yes, extensive lesion	No	Primary bowel resection
2	No	Yes, extensive lesion	Yes	Primary bowel resection
3	No	No	Yes	Unclear

lesion. In two out of three women, the endometriosis involved the full thickness of the vagina and required part of the vagina to be removed. A summary of the women in whom fistula formation was a complication is outlined in Table 6.

With advancing surgical skill and multidisciplinary working with colorectal surgeons, primary laparoscopically assisted segmental anterior resection of the rectum for extensive disease is becoming increasingly used as the treatment of choice.¹⁹ The majority of the morbidity data associated with laparoscopic anterior resection come from oncological patients and reports anastomotic leakage rates as high as 13.5%.²⁰ This does not necessarily reflect endometriosis practice in younger fitter women, and small series have reported much lower leak rates.¹⁹ The complication rate in our series is similar to previous reports (Table 7).

The development of 'Centres of Excellence' for the overall management of severe endometriosis, as advocated in recent publications,²⁶ is in our opinion the appropriate strategy. Working in conjunction with colorectal and urological surgeons and through the use of MDT meetings appropriate case selection can be made to ensure that the correct skill base is present for curative surgery.

Conclusions

Our series shows that radical laser excision of rectovaginal endometriosis is a safe procedure and adds to the growing

body of evidence that radical conservative excision appears to be the best treatment for this disease.

Previous studies have suggested that elective rectosigmoid resection is the preferred treatment of this disease. Our more conservative approach appears to give similar results with fewer complications and would lead us to suggest that it is not always necessary to resect a segment of the rectosigmoid colon when treating endometriosis. Our complication rates are similar if not lower than other published series, and it is interesting to note that the incidence of complications has not gone down over the time period of the study. This probably reflects the fact the number of cases of severe disease that we are being referred is increasing.

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Table 7. Complication reported in previous studies

	Urinary dysfunction (%)	Rectovaginal fistulae (%)
Marpeau <i>et al.</i> ²¹	15.6	6.3
Darai <i>et al.</i> ²²	17.5	7.5
Camagna <i>et al.</i> ²³		6.9
Ford <i>et al.</i> ¹¹		1.6
Donnez <i>et al.</i> ²⁴	0.9	
Fedele <i>et al.</i> ¹⁰	3.6	
Landi <i>et al.</i> ²⁵		6.6
Koninckx <i>et al.</i> ¹⁸		3.1

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