

Research Article

Laparoscopic Treatment of Endometriosis in the Recto-Sigmoid Bowel

Jens Kristensen^{1*} and Jens Jørgen Kjer²¹Department of Gynecology, Herlev University Hospital, Denmark²Department of Gynecology, Rigshospitalet University Hospital, Denmark***Corresponding author:** Jens Kristensen, Department of Gynecology, Herlev University Hospital, Denmark**Received:** July 16, 2015; **Accepted:** August 08, 2015;**Published:** August 10, 2015**Abstract**

Endometriosis in the recto-sigmoid bowel is the most severe form of endometriosis. Symptoms vary among patients, and clinical diagnosis can be challenging. Deep infiltrating bowel endometriosis is often resistant to medical treatment, such as combined oral contraceptive pill, GnRH analogues and progestogens, even though it might reduce the symptoms for a period. As a result, patients experience considerable pain for many years before they are offered appropriate treatment. Diagnosis of recto-sigmoid endometriosis should always be considered in cases of premenopausal women affected by cyclic abdominal pain and gastrointestinal symptoms particularly during the menstrual period. Diagnostic, non-invasive imaging is justified in order to detect bowel endometriotic nodules. The surgery can be very complex. Several surgical approaches exist. The surgical technique will depend on what pathology is found at surgery but also the surgeon's skills and preferences. The surgery need to be tailored to the individual patient and is highly dependent on the degree of symptoms, and the wishes of the patient. The management is also influenced by facilities, time pressure, waiting lists and age of the patient. The objective of this review is to evaluate the symptoms, diagnostic tools, surgical treatment of endometriosis in the recto-sigmoid bowel, and results of the treatment.

Keywords: Recto-sigmoid bowel; Rectal; Colorectal; Recto-vaginal septum; Surgery; Endometriosis; Deep infiltrating endometriosis; Bowel resection; Colorectal; Endometriosis

Core Tip

Diagnosis of recto-sigmoid endometriosis should always be considered in cases of premenopausal women affected by cyclic abdominal pain and gastrointestinal symptoms, particularly during the menstrual period. Diagnostic, non-invasive imaging is justified in order to detect bowel endometriotic nodules. Unexpected preoperative laparoscopic finding of bowel endometriosis in patients in primary center should be referred to a specialized tertiary center for laparoscopic treatment.

Introduction

Endometriosis represents a common gynecological disease defined as the presence of endometrial glands and stroma outside the endometrial layer of the uterus. The estimated prevalence of endometriosis among the general population of women of reproductive age varies between 2 and 10 % [1]. The prevalence rises to 30 – 45 % in women with infertility and/or pain [2].

The most common locations of endometriosis are the ovaries, the pelvic peritoneum and uterosacral ligaments. Peritoneal lesions can be superficial or deep. Deep Infiltrative Endometriosis (DIE) is defined as endometriosis infiltrating deeper than 5 mm under the peritoneum. DIE with bowel involvement is one of the most invasive and aggressive forms and can lead to chronic inflammatory reaction causing adherence and infertility. The lesions often reorganize the pelvic anatomy by dense fibrotic adhesions which cover the deep lesions and cause contraction of the rectovaginal pouch, involving the rectosigmoid.

Women can be asymptomatic, but may have a broad variety of symptoms, which are often, (but not always) cyclical, in nature. Symptoms as dysmenorrhea, pelvic pain, deep dyspareunia, dyschesia, tenesmus, pain on defecation, diarrhea alternating with constipation, flatulence and obstruction of the colon and extreme fatigue. Cyclic bleeding from the rectum, during menstrual period occurs, but is not frequent. The symptoms may have a high impact on quality of life, work productivity and health care management.

The prevalence of bowel endometriosis involvement is estimated to occur in 3% to 37 % of patients with DIE [3-6]. Bowel endometriosis is often resistant to medical treatment (hormonal therapy), even though this might reduce the symptoms for a period, therefore surgery is often the only remaining therapeutic option.

The colorectal surgeons were first to treat symptomatic intestinal endometriosis by laparotomy with intestinal resection during emergency surgery for bowel obstruction, perforation of the appendix or rectosigmoid colon [7-9].

The incidental finding of bowel endometriosis was also common in the management of mistaken colorectal cancers [10]. But gynecologists, like Redwine and Nezhat, were some of the pioneers of the laparoscopic approach to treat intestinal endometriosis as an elective procedure [11,12]. They also showed the feasibility of laparoscopic approach and potential decrease of morbidity and postoperative hospitalization.

As suggested By Chapron et al. [13] endometriotic foci located on the bowel serosa should be considered to be peritoneal and not bowel

endometriosis. Intestinal endometriosis should at least infiltrate the subserous fat tissue or be adjacent to the subserous plexus [14].

There is no current globally accepted view on the correct surgical treatment for DIE with recto-sigmoid involvement, even though the preferred treatment is complete surgical excision. Deep infiltrative endometriosis is usually multifocal and women can have multiple sites of bowel involvement. Complete surgical excision should be complete in order to achieve maximal pain relief and minimal recurrence. Surgery for deep infiltrating colorectal endometriosis remains debated and various procedures can be performed for the same pathology. Options for the management of colorectal endometriosis include laser vaporization (superficial shaving), discoid excision of the bowel wall, and segmental resection. The surgical technique will depend on what pathology is found at surgery but also the surgeon's skills and preferences. The surgery need to be tailored to the individual patient and is highly dependent on the degree of symptoms and the wishes of the patient. But the management is also influenced by facilities, time pressure, waiting lists and age of the patient.

Materials and Methods

We searched MEDLINE and EMBASE for articles published on colorectal surgery for endometriosis using the following terms "recto-sigmoid bowel", "rectal", "colorectal", "recto-vaginal", in combination with the terms "surgery" and "endometriosis". Reference lists from all relevant articles and review articles were consulted in order to identify additional studies. The search was limited to studies published in English until February 2015.

Diagnosis

Preoperative diagnosis can be challenging, one of the problems in the management of patients with endometriosis is the nonspecific nature of the symptoms. A wide variety of conditions, from musculoskeletal pathology to irritable bowel syndrome can initiate the same symptoms, as reported by Lea et al, up to a third of gynecological outpatients were found to have irritable bowel syndrome [15]. As a result, patients experience considerable pain for many years before they are offered appropriate treatment [16].

By careful vaginal inspection a visible bluish nodule in the posterior fornix, or by digital recto-vaginal examination, a mass in the rectovaginal region can sometimes be detected. Generally, a nodule must be palpated and found to be painful in the pouch of Douglas in order to be diagnostic relevant [17]. But the reliability of the examination is found to be between 36% and 50% in several reports. It is, therefore, necessary to carry out additional investigations. Transrectal sonography and transvaginal sonography with or without water contrast in the rectum have in trained ultrasonographer hands shown excellent accuracy with sensitivity 88.2% and 96%, and specificity 80% and 90%, respectively [18].

Magnetic Resonance Imaging (MRI) might be less operator dependent and can also provide information about lesions at the level of the sigmoid and demonstrate urinary locations and has the same levels of sensitivity and specificity [19].

Due to the normal appearance of the mucosa in most patients with bowel endometriosis, diagnosis by colonoscopy is often false negative and should only be performed when colon cancer is suspected. Most

important, unexpected preoperative laparoscopic finding of bowel endometriosis in patients in primary center should be referred to a specialized tertiary center for laparoscopic treatment.

Surgical Treatment of Recto-Vaginal Endometriosis with Bowel Involvement

DIE with bowel involvement is probably the most complex form of endometriosis. Furthermore, medical treatment is in some materials found to be inadequate [20] and followed by a high recurrence rate [21]. Recent literature has shown the ability of oral contraceptives to reduce symptoms dysmenorrhea, dyspareunia and dyschesia as well as reducing colo-rectal nodules [22]. Surgery however has shown to be effective in relieving pain [23-26]. In order to obtain the best results surgery with or without segmental resection may be required [27]. There should be intense concern about the difficulty of these procedures and the morbidity and complications associated with these operations [28].

In Denmark women with DIE has since 2001 been treated in two centers and today almost all cases of bowel endometriosis are treated in the centers [16].

Because of the severe complications it is important that the surgeon is skilled in laparoscopic surgery and that the patient is well examined and informed about the potential hazards of the operation. The decision of the extent of the operation should in our opinion always be taken with the patient before the operation and only in extraordinary cases during operation.

We perform the surgery laparoscopically with assistance from the colo-rectal surgeon in the resection and re-anastomosis part of the procedure. The surgical procedure consisted of laparoscopy with 5-mm 30 degree optic and 4 additional trocars, two in the right side, one suprapubic and one in the left side. The patients are placed in the lithotomy position med an intrauterine manipulator, a probe in the posterior fornix and a rectal probe. The main goal of the operation is to remove as much pathologic tissue as possible and respect the patient desire of future fertility whenever wanted. Initially division of adhesions is performed and both urethers are identified and isolated. All visible endometriosis in the pelvis is excised, ovarian endometriosis removed and the pararectal space and pouch of Douglas are prepared and presented for the colo-rectal surgeon. We think everyone agrees that lysis of adhesions and simple debulking alone will have only short-term effect, if any. In severe cases of recto-vaginal endometriosis more aggressive approach to the bowels has to be used.

Depending of the severity of the endometriosis shaving, discoid resection or segmental resection can be carried out. It is important to realize that the complications are increasing proportional with the extent of the surgical procedure. It is also essential to be aware of the characteristics the target group, namely young women with a benign disease and often with present or later desire of pregnancy. In the less severe cases local surgery as so-called shaving can be used. Shaving implies that affected bowel wall is dissected free and a superficial partial thickness excision can be performed. Usually this method can be used in cases with lesions up to 1 cm and restricted to the superior part of the muscularis [29]. The bowel wall can be secured by sutures [30]. The complication rate is between 6 and 8 % with a rather high incidence of recto-vaginal fistulas [29,31].

Patients with larger nodules mainly confined to the anterior wall and affecting no more than 1/3 of the circumference could be treated with discoid resection of the bowel. Pereira et al. [32] describe that discoid resection is chosen when the endometrial nodule was solitary and smaller than 3 cm, while Koninckx et al. [33] permits discoid resection in nodules larger than 3 cm, although difficult and long surgery should be expected. They consider that bowel resections should be preferred when the defect is more than 50% of the circumference or when the muscular defect is more than 7 cm long. For suturing the defect in the bowel wall you can use sutures [34] or a circular transanal stapling [32]. Mohr et al. [31] found a complication rate of 23% with this technique. The complication rate is found considerably lower in other publications [29].

In patients with severe symptoms and major distortion of the recto-sigmoid anatomy segmental resection of the recto-sigmoid seems to be the treatment of choice. Also these severe cases are nowadays performed with laparoscopy. In a randomized trial Daraï et al. [35] found that fewer complications were seen after the laparoscopic approach compared with laparotomy.

We perform the operation in cooperation with the colo-rectal surgeon, as we decide whether the symptoms can justify a bowel resection. Then we do the separation of adhesions, excise visible endometriosis, isolate both ureters and prepare the pararectal space and the bowel for the final surgery performed by the colo-rectal surgeon.

As there are a high percentage of severe complications we feel these complex operations should only be performed in selected cases and that the surgery should be concentrated in centers of excellence.

Mohr et al. [31] found a complication rate of 38 %, while Chambers et al. [36] in rectal cancers found leakage of the anastomosis in 3-15 % and mortality rates up to 40%. In endometriosis patients low rates of anastomotic leakage is reported [37].

If the anastomosis is very low (less than 6 cm) or if we in any way have suspicion that the anastomosis is not optimal we perform a temporary relieving ileostomy (2%). In a large study in patients with recto-vaginal endometriosis Ruffo et al. [38] performed ileostomy in 14% of the cases and reported anastomosis leakage in 4, 8% of the cases. In the long term colorectal resection significantly reduce endometriosis related symptoms and improve quality of life and sexual satisfaction [39].

It is imperative to focus on the type of patients when you are considering surgery involving the bowels, especially the colo-rectal area. This location accounts for 70-93% of all bowel endometriotic lesions [14]. In many of the publications concerning colo-rectal surgery the patients are having a malignant disease. Gynecologists are dealing with young women with a troublesome, however not fatal disease. Furthermore these patients still have the desire of pregnancy. This creates a demand of as conservative treatment as possible. In order to make a qualified preoperative evaluation of these patients we have decided in Denmark to concentrate them in two centers with 20-30 cases yearly in each center.

Conclusion

Diagnosis of recto-sigmoid endometriosis should always be

considered in cases of premenopausal women affected by cyclic abdominal pain and gastrointestinal symptoms, particularly during the menstrual period. Diagnostic, non-invasive imaging is justified in order to detect bowel endometriotic nodules. To reduce impairment of pelvic organ function and complications, knowledge of the retroperitoneal anatomy is essential, especially because the anatomy is distorted by deep endometriosis. To receive such knowledge, it is important to establish a specialist endometriosis center with a multidisciplinary team of expert gynecologists, laparoscopically interested gastro-intestinal surgeons, urologists, and good operation facilities.

References

1. Eskenazi B, Warner ML. Epidemiology of endometriosis. *Obstet Gynecol Clin North Am.* 1997; 24: 235-258.
2. Gruppo Italiano per lo studio dell'endometriosi. Prevalence and anatomical distribution of endometriosis in women with selected gynaecological conditions: results from a multicentric Italian study. *Hum Reprod.* 1994; 9: 1158-1162.
3. Collin GR, Russell JC. Endometriosis of the colon. Its diagnosis and management. *Am Surg.* 1990; 56: 275-279.
4. Coronado C, Franklin RR, Lotze EC, Bailey HR, Valdés CT. Surgical treatment of symptomatic colorectal endometriosis. *Fertil Steril.* 1990; 53: 411-416.
5. Graham B, Mazier WP. Diagnosis and management of endometriosis of the colon and rectum. *Dis Colon Rectum.* 1988; 31: 952-956.
6. Bailey HR, Ott MT, Hartendorp P. Aggressive surgical management for advanced colorectal endometriosis. *Dis Colon Rectum.* 1994; 37: 747-753.
7. Floberg J, Bäckdahl M, Silferswärd C, Thomassen PA. Postpartum perforation of the colon due to endometriosis. *Acta Obstet Gynecol Scand.* 1984; 63: 183-184.
8. Afdhal NH, Smith J, Heffernan S, Doyle JS, Gaffney E. Acute small bowel obstruction secondary to endometriosis: two case reports and a review of the literature. *Ir Med J.* 1984; 77: 141-143.
9. Haynes IG. Endometriosis causing large bowel obstruction. *J R Coll Surg Edinb.* 1982; 27: 310-312.
10. Prystowsky JB, Stryker SJ, Ujiki GT, Poticha SM. Gastrointestinal endometriosis. Incidence and indications for resection. *Arch Surg.* 1988; 123: 855-858.
11. Redwine DB, Sharpe DR. Laparoscopic segmental resection of the sigmoid colon for endometriosis. *J Laparoendosc Surg.* 1991; 1: 217-220.
12. Nezhat C, Nezhat F, Pennington E. Laparoscopic treatment of infiltrative rectosigmoid colon and rectovaginal septum endometriosis by the technique of videolaparoscopy and the CO₂ laser. *Br J Obstet Gynaecol.* 1992; 99: 664-667.
13. Chapron C, Fauconnier A, Vieira M, Barakat H, Dousset B, Pansini V, et al. Anatomical distribution of deeply infiltrating endometriosis: surgical implications and proposition for a classification. *Hum Reprod.* 2003; 18: 157-161.
14. Remorgida V, Ferrero S, Fulcheri E, Ragni N, Martin DC. Bowel endometriosis: presentation, diagnosis, and treatment. *Obstet Gynecol Surv.* 2007; 62: 461-470.
15. Lea R, Bancroft K, Whorwell PJ. Irritable bowel syndrome, chronic pelvic inflammatory disease and endometriosis: a comparison of symptomatology. *Eur J Gastroenterol Hepatol.* 2004; 16: 1269-1272.
16. Kristensen J1, Kjer JJ. Laparoscopic laser resection of rectovaginal pouch and rectovaginal septum endometriosis: the impact on pelvic pain and quality of life. *Acta Obstet Gynecol Scand.* 2007; 86: 1467-1471.
17. Abrao MS, Goncalves MO, Dias JA, Podgaec S, Chamie LP, Blasbalg R.

- Comparison between clinical examination, transvaginal sonography and magnetic resonance imaging for the diagnosis of deep endometriosis. *Hum Reprod.* 2007; 22: 3092-3097.
18. Bergamini V, Ghezzi F, Scarperi S, Raffaelli R, Cromi A, Franchi M. Preoperative assessment of intestinal endometriosis: A comparison of transvaginal sonography with water-contrast in the rectum, transrectal sonography, and barium enema. *Abdom Imaging.* 2010; 35: 732-736.
 19. Saba L, Guerriero S, Sulcis R, Pilloni M, Ajossa S, Melis G, et al. MRI and "tenderness guided" transvaginal ultrasonography in the diagnosis of recto-sigmoid endometriosis. *J Magn Reson Imaging.* 2012; 35: 352-360.
 20. Fedele L, Bianchi S, Zanconato G, Bettoni G, Gotsch F. Long-term follow-up after conservative surgery for rectovaginal endometriosis. *Am J Obstet Gynecol.* 2004; 190: 1020-1024.
 21. Shaw RW. Treatment of endometriosis. *Lancet.* 1992; 340: 1267-1271.
 22. Ferrari S, Persico P, Di Puppo F, Vigano P, Tandoi I, Garavaglia E, et al. Continuous low-dose oral contraceptive in the treatment of colorectal endometriosis evaluated by rectal endoscopic ultrasonography. *Acta Obstet Gynecol Scand.* 2012; 91: 699-703.
 23. Acién P, Núñez C, Quereda F, Velasco I, Valiente M, Vidal V. Is a bowel resection necessary for deep endometriosis with rectovaginal or colorectal involvement? *Int J Womens Health.* 2013; 5: 449-455.
 24. Fanfani F, Fagotti A, Gagliardi ML, Ruffo G, Ceccaroni M, Scambia G, et al. Discoid or segmental rectosigmoid resection for deep infiltrating endometriosis: a case-control study. *Fertil Steril.* 2010; 94: 444-449.
 25. Ribeiro PA, Rodrigues FC, Kehdi IP, Rossini L, Abdalla HS, Donadio N, et al. Laparoscopic resection of intestinal endometriosis: a 5-year experience. *J Minim Invasive Gynecol.* 2006; 13: 442-446.
 26. Redwine DB, Koning M, Sharpe DR. Laparoscopically assisted transvaginal segmental resection of the rectosigmoid colon for endometriosis. *Fertil Steril.* 1996; 65: 193-197.
 27. Ford J, English J, Miles WA, Giannopoulos T. Pain, quality of life and complications following the radical resection of rectovaginal endometriosis. *BJOG.* 2004; 111: 353-356.
 28. Minelli L, Fanfani F, Fagotti A, Ruffo G, Ceccaroni M, Mereu L, et al. Laparoscopic colorectal resection for bowel endometriosis: feasibility, complications, and clinical outcome. *Arch Surg.* 2009; 144: 234-239.
 29. Pereira RM, Zanatta A, Preti CD, de Paula FJ, da Motta EL, Serafini PC. Should the gynecologist perform laparoscopic bowel resection to treat endometriosis? Results over 7 years in 168 patients. *J Minim Invasive Gynecol.* 2009; 16: 472-479.
 30. Reich H, McGlynn F, Salvat J. Laparoscopic treatment of cul-de-sac obliteration secondary to retrocervical deep fibrotic endometriosis. *J Reprod Med.* 1991; 36: 516-522.
 31. Mohr C, Nezhat FR, Nezhat CH, Seidman DS, Nezhat CR. Fertility considerations in laparoscopic treatment of infiltrative bowel endometriosis. *JLS.* 2005; 9: 16-24.
 32. Pereira RM, Zanatta A, Reich H, Bianchi PH, Fettback PB, Motta EL, et al. Use of circular stapler for laparoscopic excision of rectosigmoid anterior wall endometriosis. *Surg Technol Int.* 2008; 17: 181-186.
 33. Koninckx PR, Ussia A, Adamyan L, Wattiez A, Donnez J. Deep endometriosis: definition, diagnosis, and treatment. *Fertil Steril.* 2012; 98: 564-571.
 34. Nezhat C, Nezhat F, Pennington E, Nezhat CH, Ambroze W. Laparoscopic disk excision and primary repair of the anterior rectal wall for the treatment of full-thickness bowel endometriosis. *Surg Endosc.* 1994; 8: 682-685.
 35. Daraï E1, Dubernard G, Coutant C, Frey C, Rouzier R, Ballester M. Randomized trial of laparoscopically assisted versus open colorectal resection for endometriosis: morbidity, symptoms, quality of life, and fertility. *Ann Surg.* 2010; 251: 1018-1023.
 36. Chambers WM, Mortensen NJ. Postoperative leakage and abscess formation after colorectal surgery. *Best Pract Res Clin Gastroenterol.* 2004; 18: 865-880.
 37. De Cicco C, Corona R, Schonman R, Mailova K, Ussia A, Koninckx P. Bowel resection for deep endometriosis: a systematic review. *BJOG.* 2011; 118: 285-291.
 38. Ruffo G, Rossini R. The outcomes of laparoscopic resection of bowel endometriosis. *Curr Opin Obstet Gynecol.* 2013; 25: 302-307.
 39. Kössi J, Setälä M, Mäkinen J, Härkki P, Luostarinen M. Quality of life and sexual function 1 year after laparoscopic rectosigmoid resection for endometriosis. *Colorectal Dis.* 2013; 15: 102-108.