Quality of life after laparoscopic colorectal resection for endometriosis

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BACKGROUND: Indications of colorectal resection for endometriosis remain controversial because of the risk of major complications. Therefore, the aims of the current study were to evaluate the efficacy of laparoscopic segmental colorectal resection for endometriosis on quality of life and gynaecologic and digestive symptoms, and its complications.

METHODS: After magnetic resonance imaging and rectal endoscopic sonographic evaluation of symptomatic colorectal endometriosis, 58 consecutive women requiring colorectal resection were included in this study. Symptom questionnaires and the short-form (SF)-36 Health Status and the quality of life score were completed. Linear intensity scores for several gynaecologic and digestive symptoms and perioperative complications were also recorded.

RESULTS: Fifty-one women (88%) underwent laparoscopic segmental colorectal resection and seven required laparoconversion. Major complications occurred in nine cases (15.5%), including six rectovaginal fistulae (10.3%), and the three remaining complications corresponded to a haemoperitoneum, a uroperitoneum and a pelvic abscess. Median follow-up after colorectal resection was 22.5 months (2–55 months). A significant improvement in dysmenorrhoea (P < 0.0001), dyspareunia (P < 0.0001), bowel movement pain or cramping (P < 0.0001), pain on defecation (P < 0.0001), diarrhoea (P < 0.016), lower back pain (P < 0.0001) and asthaenia (P < 0.0002) was observed. Tenesmus, rectorrhagia and constipation were not improved. All the items of the SF-36 Health Status and the quality of life score were improved after colorectal resection for endometriosis.

CONCLUSION: Laparoscopic segmental colorectal resection for endometriosis significantly improves quality of life and gynaecologic and digestive symptoms. However, women have to be informed on the risk of complications including rectovaginal fistula.

Key words: colorectal resection/endometriosis/laparoscopy/quality of life/SF-36 Health Status

Introduction

Endometriosis is a well-known gynaecologic disorder defined by the presence of endometrial gland and stroma outside the uterus (Koninckx et al., 1991). Deep infiltrating pelvic endometriosis and bowel endometriosis are less frequent than peritoneal and ovarian endometrioses. The estimated incidence of bowel endometriosis is between 5.3 and 12% (Macafee et al., 1960; Weed and Ray, 1987). The main locations of bowel endometriosis are the rectum and recto-sigmoid junction reaching up to 93% of all intestinal endometriotic lesions (Coronado et al., 1990; Bailey et al., 1994; Tran et al., 1996; Jerby et al., 1999) and are source of altered quality of life (Garry et al., 2000; Redwine and Wright, 2001).

Since the first report by Redwine and Sharpe on laparoscopic colorectal resection for endometriosis (Redwine and Sharpe, 1991), several studies have confirmed the feasibility of this approach (Jerby et al., 1999; Possover et al., 2000; Duepree et al., 2002; Darai et al., 2005). Previous studies demonstrated that colorectal resection for endometriosis was associated with a significant improvement in chronic pelvic pain, dysmenorrhoea, dyspareunia and digestive symptoms (Redwine et al., 1996; Urbach et al., 1998; Redwine and Wright, 2001; Thomassin et al., 2004; Darai et al., 2005). Moreover, laparoscopic treatment of deep infiltrating endometriosis is linked to an improvement in quality of life (Garry et al., 2000; Redwine and Wright, 2001; Abbott et al., 2004; Fedele et al., 2004). However, little data on quality of life after laparoscopic colorectal resection for endometriosis are available.

Therefore, the aim of this study was to evaluate the quality of life using validated questionnaire after laparoscopic segmental colorectal resection for endometriosis.

Patients and methods

Patients

Between April 2001 and April 2004, 58 women with colorectal endometriosis were referred to the gynaecology department of Tenon Hospital.
Hospital, Paris. Before surgery, all women underwent both magnetic resonance imaging (MRI) and rectal endoscopic sonography (RES). MRI and RES criteria used to diagnose colorectal endometriosis were signal abnormalities and morphologic criteria as previously described (Roseau et al., 2000; Bazot et al., 2003).

In order to avoid a possible bias linked to the type of surgery, only women undergoing a segmental colorectal resection were included in this study. Epidemiological characteristics of the 58 women and their relevant surgical and medical histories are summarized in Table 1. In addition to previous medical treatments, all the patients received GnRH analogues for 3 months before surgery.

### Methods

All the women completed symptom questionnaires on gynaecological (dysmenorrhoea, non-menstrual pelvic pain and dyspareunia), digestive (diarrhoea and/or constipation, pain on bowel movement, intestinal cramping, pain on defecation, tenesmus and cecal rectal bleeding) and non-specific disorders (lower back pain and asthenia) (Thomassin et al., 2004; Darai et al., 2005). They completed the same questionnaire after the operation and were also asked about changes in bowel and urinary or sexual function. For quality of life evaluation, a French validated translation of the short-form (SF)-36 Health Status and the quality of life score was used (Lepere et al., 1998). SF-36 questionnaire evaluates physical functioning (10 questions), bodily pain (2 questions), general health (5 questions), vitality (4 questions), social functioning (2 questions), mental health (5 questions), health transition (1 question) and role physical and role emotional studying if patients have any problems with their work or other regular daily activities as a result of their physical health (4 questions) or any emotional problems (3 questions), respectively.

Briefly, the laparoscopic procedure was performed in the modified dorsolithotomy position under endotracheal general anaesthesia. Propylactic anticoagulant therapy was given the evening before the operation, and prophylactic antibiotic therapy was given at the beginning of the operation. After pneumoperitoneum induction, three suprapubic trocars, including a 12-mm trocar in the right iliac fossa, a 15-mm trocar in the median suprapubic area and a 5-mm trocar in the left iliac fossa were introduced. After exploration of the pelvic cavity and after adhesiolsis and/or ovarian cystectomy when required, the colorectum was released using bipolar forceps and scissors. All endometriotic lesions, including those affecting the uterosacral ligaments, torus uterinum, peritoneum of the pouch of Douglas and colorectum were mobilized before sectioning the colorectum with an endo GIA 45 (Auto Suture, Tyco S.A., Elancourt, France). After withdrawing the median suprapubic trocar, the incision was enlarged to 3 cm to allow the colorectum to be exteriorized and resected before creating a purse for the anvil. The colon was placed in the pelvic cavity before closing the suprapubic abdominal incision. Then, using rectally introduced CCEA forceps (Auto Suture, Tyco S.A.), colorectal anastomosis was created.

Histological criteria for colorectal endometriosis included the presence of ectopic endometrial and stromal tissues penetrating through the bowel wall. The largest diameter of the lesion was measured on the colorectal specimen.

Continuous variables were compared with Student’s t-test and categorical variables were compared with the \( \chi^2 \) test or Fisher’s exact test, as appropriate. \( P \) values < 0.05 were considered statistically significant. Because of multiple comparisons, we used Bonferroni correction to determine the significance levels of two-tailed \( P \) values (Bland and Altman, 1995). This was achieved by dividing the common \( P \) value border 0.05 by the number of comparisons.

### Results

#### Surgical findings and intra- and post-operative complications of laparoscopic segmental colorectal resection for endometriosis

Fifty-one of the 58 women (88%) underwent segmental colorectal resection by laparoscopy. The remaining seven women (12%) required conversion to open surgery. The indications of laparconversion were severe adhesions related to endometriosis in four cases including a woman who had a history of colostomy for bowel injury during a previous laparoscopy and a woman with three laparotomies for cystectomies and for a myomectomy. The remaining three conversions were related to incomplete circular stapled anastomosis at the end of the laparoscopic procedure in one case, for ureteral involvement by endometriosis requiring segmental ureterectomy with reimplantation into the bladder in another case and to haemorrhage for the last case.

During surgery, 89% of the women were found to have severe adhesions with involvement of the Douglas pouch. Extensive ureterolysis was required in 37 women (64%) (unilateral in 35% and bilateral in 30%). Eighteen women (31%) underwent ovarian cystectomy (unilateral in 25% and bilateral in 7%) with complete removal of the cystic wall. Torus resection was performed in 50 women (86%), together with unilateral or bilateral uterosacral ligament resection in nine (16%) and 38 (66%) women, respectively. In addition to segmental colorectal resection, partial vaginal resection was necessary in 12 women (21%). Six patients (10%) had a hysterectomy and one patient (2%) an appendectomy. The mean size of the segmental colorectal resection was 10.2 cm. Blood transfusion was necessary in 10 patients (17%).

Post-operative complications occurred in nine of the 58 women (15.5%).

The main major complication was rectovaginal fistula diagnosed in six women (10.3%). Four rectovaginal fistulae occurred in women requiring both colorectal and vaginal resections, and two occurred in women undergoing a partial necrosis of posterior vaginal cuff probably related to extensive electrocoagulation. Five of these women underwent colostomy and the last a Hartmann surgery. A woman underwent a haemoperitoneum diagnosed on post-operative hour 3 related to a vessel injury of the protective colostomy treated by laparoscopic coagulation. Two other complications were observed including an uroperitoneum diagnosed on day 1 requiring a ureteral stent for 6 weeks and an abscess behind colorectal anastomosis diagnosed on post-operative day 6 requiring a laparoscopic drainage.
Qualitative evolution of symptoms after surgery among the 52 pre- and post-operative symptom intensity scores in the 58 women.

Evolution of symptoms and quality of life after laparoscopic colorectal resection for endometriosis

Median follow-up after colorectal resection was 22.5 months (2–55 months). Six of the 58 women (10.3%) were lost of follow-up. Three of them live in foreign countries, and the remaining three women have changed their address.

Qualitative data on symptoms before and after colorectal resection are summarized in Table II. Dysmenorrhoea disappeared after colorectal resection in 28 of the 49 (57%) women concerned. Dyspareunia disappeared after surgery in 22 of the 43 (51%) women concerned, but one woman complained of increased dyspareunia. Pain on defecation disappeared in six of 27 (22%) women and decreased in 15 of 27 (56%). Pain on bowel movement and intestinal cramping decreased or disappeared in 33 of 40 (82.5%) women concerned. Diarrhoea and constipation decreased or disappeared in 13 of 15 (87%) women and in 19 of 34 (56%) women, respectively. Semi-quantitative data on symptoms before and after colorectal resection are summarized in Table III. A significant improvement in dysmenorrhoea, dyspareunia, bowel movement pain or cramping, pain on defecation, diarrhoea, lower back pain and asthænia was observed. No change was observed for tenesmus, rectorrhagia and constipation.

Pre- and post-operative scores for SF-36 questionnaire evaluating physical functioning, role physical, bodily pain, general health, vitality, social functioning, mental health, role emotional and health transition are given in Figure 1. All items were significantly improved after colorectal resection for endometriosis. In all the domains explored by the SF-36 questionnaire, Bonferroni correction test confirmed the significant improvement. No significant difference in pre- and post-operative scores for SF-36 questionnaire was observed between women with or without post-operative complication (Figure 2).

Table II. Qualitative evolution of symptoms after surgery among the 52 women with laparoscopic colorectal resection

<table>
<thead>
<tr>
<th>Symptom (n)</th>
<th>Disappeared (%)</th>
<th>Decreased (%)</th>
<th>Same (%)</th>
<th>Increased (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dysmenorrhoea (49)</td>
<td>28 (57%)</td>
<td>17 (35%)</td>
<td>4 (8%)</td>
<td>0</td>
</tr>
<tr>
<td>Dyspareunia</td>
<td>22/43 (51%)</td>
<td>16/43 (37%)</td>
<td>4/43 (9%)</td>
<td>1/43 (2%)</td>
</tr>
<tr>
<td>Bowel movement pain</td>
<td>17/40 (42%)</td>
<td>16/40 (40%)</td>
<td>5/40 (13%)</td>
<td>2/40 (5%)</td>
</tr>
<tr>
<td>Constipation</td>
<td>4/34 (12%)</td>
<td>15/34 (44%)</td>
<td>7/34 (21%)</td>
<td>8/34 (24%)</td>
</tr>
<tr>
<td>Diarrhoea</td>
<td>8/15 (53%)</td>
<td>5/15 (33%)</td>
<td>1/15 (7%)</td>
<td>1/15 (7%)</td>
</tr>
<tr>
<td>Pain on defecation</td>
<td>6/27 (22%)</td>
<td>15/27 (56%)</td>
<td>4/27 (15%)</td>
<td>2/27 (7%)</td>
</tr>
<tr>
<td>Rectorrhagia</td>
<td>3/5 (60%)</td>
<td>1/5 (20%)</td>
<td>1/5 (20%)</td>
<td>0</td>
</tr>
<tr>
<td>Lower back pain</td>
<td>17/30 (57%)</td>
<td>7/30 (23%)</td>
<td>6/30 (20%)</td>
<td>0</td>
</tr>
<tr>
<td>Tenesmus</td>
<td>5/22 (23%)</td>
<td>4/22 (18%)</td>
<td>7/22 (32%)</td>
<td>6/22 (27%)</td>
</tr>
<tr>
<td>Asthaenia</td>
<td>8/34 (24%)</td>
<td>18/34 (53%)</td>
<td>4/34 (12%)</td>
<td>4/34 (12%)</td>
</tr>
</tbody>
</table>

Table III. Pre- and post-operative symptom intensity scores in the 58 women who underwent colorectal resection

<table>
<thead>
<tr>
<th>Symptom</th>
<th>Median preoperative intensity score (range)</th>
<th>Median post-operative intensity score (range)</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dysmenorrhoea</td>
<td>8 (0–10)</td>
<td>0 (0–10)</td>
<td>&lt;0.0001</td>
</tr>
<tr>
<td>Dyspareunia</td>
<td>6 (0–10)</td>
<td>0 (0–10)</td>
<td>&lt;0.0001</td>
</tr>
<tr>
<td>Bowel movement pain</td>
<td>6 (0–10)</td>
<td>0 (0–8)</td>
<td>&lt;0.0001</td>
</tr>
<tr>
<td>Rectorrhagia</td>
<td>5 (0–10)</td>
<td>4 (0–8)</td>
<td>0.016</td>
</tr>
<tr>
<td>Constipation</td>
<td>1.5 (0–10)</td>
<td>0 (0–8)</td>
<td>0.55</td>
</tr>
<tr>
<td>Pain on defecation</td>
<td>17 (35%)</td>
<td>42 (90%)</td>
<td>&lt;0.0001</td>
</tr>
<tr>
<td>Lower back pain</td>
<td>3.5 (0–10)</td>
<td>0 (0–9)</td>
<td>0.55</td>
</tr>
<tr>
<td>Tenesmus</td>
<td>0 (0–10)</td>
<td>0 (0–10)</td>
<td>&lt;0.0002</td>
</tr>
</tbody>
</table>

Discussion

This study has demonstrated that laparoscopic segmental colorectal resection for endometriosis is associated with a significant improvement in quality of life and gynaecological and digestive symptoms.

The most striking data of the present study are a significant improvement in quality of life after laparoscopic segmental...
colorectal resection for endometriosis. Indications of colorectal resection for endometriosis remain controversial because of the risk of major complications (Emmanuel and Davis, 2005). Fedele et al. have shown that the risk of clinical recurrence requiring further treatment was significantly higher in women who did not undergo colorectal resection when this organ was involved (Fedele et al., 2004). In this study, 12.5% of the women experienced major complications. Our rate of rectovaginal fistula is higher than those reported in previous laparoscopic series of colorectal resection for endometriosis (Verspyck et al., 1997; Jerby et al., 1999; Duepree et al., 2002; Thomassin et al., 2004; Campagnacci et al., 2005; Darai et al., 2005). This discrepancy could be related to different surgical options for management of colorectal endometriosis. Indeed, several authors included in their series both superficial or full thickness and segmental colorectal resections. Duepree et al. have demonstrated that the rate of complications was depending on the type of surgery reaching up to 11% for segmental colorectal resection (Duepree et al., 2002). In our study, only women undergoing segmental colorectal resection have been included, and this option has been recently confirmed to be the best. Indeed, Remorgida et al. definitively demonstrated that full thickness colorectal resection for endometriotic nodule was associated with a risk of incomplete resection in nearly half of the patients (Remorgida et al., 2005). Several potential explanations could be suggested for our high rate of rectovaginal fistula: (i) our limited experience with laparoscopic colorectal resection for endometriosis; (ii) the use of a systematic retroanastomotic drainage that has been found to be a determinant factor of fistula after colorectal resection (Merad et al., 1999) and, finally, the requirement of concomitant vaginal and colorectal resections without systematic protective colostomy. Except for Possover et al. using a systematic laparoscopically-vaginal route to treat colorectal endometriosis, no data are available on the rate of simultaneous colorectal and vaginal resections for endometriosis (Possover et al., 2000). Our data support the use of a systematic protective colostomy when a vaginal resection is performed.

This study has demonstrated that all items of Medical Outcomes Study (MOS) SF-36 questionnaire on quality of life have been improved after laparoscopic segmental colorectal resection for endometriosis. Among MOS SF-36 items, role physical, bodily pain and vitality parameters were the most improved after surgery. Although some women experienced severe complications requiring second surgery, our data have shown that these women’s conditions significantly improved after colorectal resection and that no difference in quality of life was observed between women with or without post-operative complications. Redwine and Wright have shown that aggressive laparoscopic excision of complete obliteration of the cul-de-sac of Douglas for endometriosis offered good relief of symptoms (Redwine and Wright, 2001). However, they did not evaluate the impact of surgery on quality of life. Previous studies have attempted to evaluated the impact of surgery on quality of life using visual analogue scale (VAS) (Jones and Sutton, 2003; Darai et al., 2005). Jones and Sutton demonstrated that laparoscopic ablative surgery for stages III–IV endometriosis was associated with increased patient satisfaction (Jones and Sutton, 2003). Moreover, Darai et al. observed a positive impact of laparoscopic colorectal resection on quality of life (Darai et al., 2005). In a randomized placebo-controlled trial, Abbott et al. demonstrated that laparoscopic excision of endometriosis is more effective than placebo on pain reduction and quality of life improvement (Abbott et al., 2004). However, Abbott et al. underlined that VAS alone provided limited information imposing the use of validated questionnaires to evaluate quality of life (Abbott et al., 2004). Several questionnaires have been recommended such as EQ-5D and SF-12 that included limited items (Garry et al., 2000; Abbott et al., 2003; Abbott et al., 2004; Ford et al., 2004). Using these questionnaires, Abbott et al. confirmed that ablative surgery for endometriosis improved quality of life (Abbott et al., 2003; Abbott et al., 2004). In this study, we opted to use a French translation of the MOS SF-36 that has been validated to evaluate quality of life after colorectal surgery (Miller, 2000; Bretagnol et al., 2004; Zupi et al. 2004; Laursen et al., 2005). Recently, in women with chronic non-malignant pain, including a group with endometriosis, Laursen et al. have demonstrated a significant negative correlation between VAS rating and quality of life evaluated by MOS SF-36 questionnaire (Laursen et al., 2005). Moreover, these authors found a relation between hyperalgesia to pressure pain threshold measured and the impairment of SF-36 physical function as well as mental health parameters. These interesting data raise the issue of the systematic use of MOS SF-36 questionnaire as a tool to identify women who may have a benefit of surgery. Moreover, a previous study (Abbott et al., 2004) demonstrated a placebo effect of surgery on quality of life in 30% of women with endometriosis; hence, further studies using the same quality of life questionnaire are required to compare medical and surgical treatment for endometriosis.

In our experience, a significant improvement in gynaecologic and digestive symptoms was observed. Nevertheless, our data also underlined that surgery has a low impact on some symptoms such as constipation, rectorrhagia and tenesmus. These results are in keeping with those of Redwine and Wright using qualitative and semi-quantitative evaluations of symptoms after complete resection of obliterated pouch of Douglas because of endometriosis (Redwine and Wright, 2001). Moreover, Redwine and Wright (2001) underlined that women with predominant low back pain or asthenaemia are less likely candidates for extensive surgery. However, these data are partly in contrast with those of Vercellini et al. showing no reduction in medium- or long-term frequency and severity of recurrent dysmenorrhoea after laparoscopic uterosacral ligament resection (Vercellini et al., 2003). This apparent discrepancy underlined the need to evaluate globally all symptoms of women with endometriosis. Indeed, as observed in this study, many anatomic pelvic structures and organs are involved by deep pelvic endometriosis and often required an enbloc surgery. Moreover, there is no strict correlation between location of endometriosis and symptoms. Therefore, analysis of a symptom alone may lead to underestimating the benefit of the surgery. This is confirmed in this study when analysis of constipation and tenesmus were performed. Even though these symptoms seemed to be unchanged or worsen after surgery, physiopathology of
symptoms before and after surgery notably differ. Preoperative symptoms are directly related to endometriotic involvement, whereas the persistence of these symptoms after surgery is often subsequent to surgical procedures and raises the issue of colonic J-pouch or coloplasty that has been used to improve bowel function in patients undergoing low colorectal or colo-anal anastomosis (Remzi et al., 2005).

In conclusion, despite a high rate of post-operative complications, our data have demonstrated that laparoscopic segmental colorectal resection for endometriosis was associated with a significant improvement in quality of life. Further studies are required to evaluate the utility of quality of life questionnaire such as MOS SF-36 to identify good candidate for future surgery for endometriosis and to establish the safety of the laparoscopic approach by means of randomized controlled trials.

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Laparoscopic surgery for endometriosis and quality of life

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