Is Pouch of Douglas Obliteration a Marker of Bowel Endometriosis?

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ABSTRACT

Study Objective: To estimate the clinical significance of pouch of Douglas (POD) obliteration in women undergoing laparoscopic excision of endometriosis.

Design: Prospective study (Canadian Task Force Classification II-2).

Setting: University-affiliated tertiary referral center for endometriosis.


Interventions: Demographic, historical, and final surgical data were compared between women with and without POD obliteration at laparoscopy. Logistic regression analyses were performed to investigate the predictive value of POD obliteration at laparoscopy with regard to bowel endometriosis.

Measurements and Main Results: One hundred consecutive women with POD obliteration at laparoscopy were included. Nearly 60% (58%, 95% confidence interval [CI] 0.48–0.67, n = 58/100) of the women with POD obliteration required bowel surgery compared with 20% (95% CI 0.16–0.25, 72/354) of women without POD obliteration (p < .001). Of the POD obliteration group, 66% (95% CI 0.53–0.76) required bowel shaving, 12% (0.06–0.23) full segmental rectal resection, 9% (0.04–0.19) wedge rectal resection, 5% (0.02–0.14) full segmental rectosigmoid resection and 9% (0.04–0.19) a combination of the above. Bowel endometriosis was histologically confirmed in all women.

Conclusion: POD obliteration at laparoscopy carries a high risk of bowel endometriosis and bowel surgery. This risk is three times higher than those without POD obliteration. Women with POD obliteration should be managed in tertiary referral centers for the treatment of endometriosis where colorectal input is available. Journal of Minimally Invasive Gynecology (2011) ■■■■ –■■ © 2011 AAGL. All rights reserved.

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challenging and fraught with danger. In addition to the increased risk of conversion to laparotomy [10], POD obliteration may signify the presence of bowel endometriosis, which in turn may necessitate bowel surgery [11]. It would seem reasonable therefore to refer women diagnosed with POD obliteration to tertiary care centers with appropriate colorectal expertise for surgical treatment [12,13]. Although this premise seems logical, it is currently not based on good quality evidence. In fact there is scarce information in the literature regarding the implications of POD obliteration in clinical and surgical practice. The aim of this study is to estimate the clinical significance, particularly the incidence of bowel involvement in women with POD obliteration undergoing laparoscopy for endometriosis.

Materials and Methods

This prospective study was carried out at a university-affiliated tertiary care center for endometriosis. All women who underwent laparoscopic surgery for treatment of pelvic pain or infertility-associated endometriosis between October 2004 and September 2008 were included. Data collection consisted of patient demographics, standardized history, past history of treatments (medical and surgical) for endometriosis, laparoscopic findings, operation details, and histologic results. In cases where clinical suspicion for deep infiltrating endometriosis was high (bowel symptoms, palpable rectovaginal nodules on examination or severe endometriosis laparoscopically confirmed by other gynecologists), colorectal referrals were made before surgery for assessment, counseling, and preparation for possible bowel surgery.

Patients with suspected severe endometriosis were bowel prepared by having clear fluids and given a magnesium preparation the day before surgery. All operations were performed by or under the direct supervision of the senior surgeon (A.L.). Routine entry was performed with Hasson’s open technique for 10-mm primary umbilical port and three 5-mm accessory ports inserted under direct vision in the right and left iliac fossae and left upper quadrant. The patient was then placed in the steep Trendelenburg position.

After systematic examination of the upper, lower abdomen and the pelvis, adhesiolysis was carried out as required to enable full assessment of the pelvis. All visible endometrotic and any suspicious lesions were excised with monopolar diathermy scissors or Harmonic scalpel. Rectal and vaginal probes were used to aid dissecting the rectovaginal space.

In cases of bowel endometriosis, joint colorectal and gynecologic decision was made to determine whether to proceed with bowel surgery and the type of procedure required (depending on the type and severity of presenting symptoms, the size, site of the nodule, the length of bowel affected and the degree of bowel stricture). Women with bowel endometriosis who were symptom free or had minimal symptoms and who were not prepared to undergo bowel surgery had endometriosis visually diagnosed but not histologically confirmed by tissue biopsy.

Operative findings were printed onto paper and recorded onto DVDs. Documentation of the anatomic locations of endometriosis and histologic results were entered directly into a computer database. All patients who underwent bowel surgery were given intraoperative antibiotics. Oral dietary intake was recommenced once bowel sounds were present, usually on postoperative day 1 or 2.

Demographic, historic, and surgical data were analyzed and contrasted between two independent groups (those with and without POD obliteration) with χ² analysis for comparison of proportions and for the continuous data, where data were normally distributed as determined by one-sample Kolmogorov-Smirnov tests (such as for age), the Student’s t test was used, whereas for non-normally distributed data (such as parity) the Wilcoxon rank-sum test was used. A multiple logistic regression modeled predictors of bowel endometriosis and generated odds ratios (OR) with 95% confidence intervals (CI). All analyses were conducted with SPSS v17.0 (SPSS, Inc., Chicago, IL), and a p < .05 was considered indicative of significance.

Results

A total of 454 women underwent laparoscopic excision of endometriosis during the study period. The mean age was 35.2 (SD 7.4). Approximately one in five (22%, 95% CI 0.18–0.26, n = 100/454) of the study population were found to have obliteration of the POD. There was no significant difference in parity between those with or without POD obliteration (mean 0.7, SD 1.0 vs 0.6, SD 1.0, respectively). Compared with women without POD obliteration, women with POD obliteration were significantly older (mean age 34.8 vs 36.5 years; p < .05; Table 1). In addition, women with POD obliteration were also more likely to present with infertility (47% [95% CI 0.38–0.57] vs 33% [95% CI 0.29–0.38]; p < .05) and had previous surgery for
endometriosis (70% [95% CI 0.60–0.78] vs 49% [95% CI 0.43–0.54]; p < .001).

Nearly half (52%, 95% CI 0.42–0.62, n = 52/100) of the women with POD obliteration had been referred to our unit by other specialists, including gynecologists, in vitro fertilization specialists, and colorectal surgeons. Approximately one third (33%, 95% CI 0.22–0.46, n = 17/52) of these women had undergone laparoscopy to confirm severe endometriosis. The remainder (48%, 95% CI 0.38–0.58, n = 48/100) had been referred by general practitioners.

Nearly 60% (58%, 95% CI 0.48–0.67, n = 58/100) of the women with POD obliteration required bowel surgery, compared with only 20% (95% CI 0.16–0.25, n = 72/354) of those without POD obliteration (p < .001). Of the types of bowel surgery performed for the POD obliteration group, 65.5% (95% CI 0.53–0.76) required bowel shaving, 12.1% (95% CI 0.06–0.23) full segmental rectal resection, 8.6% (95% CI 0.04–0.19) wedge rectal resection, 5.2% (95% CI 0.02–0.14) full segmental rectosigmoid resection, and 8.6% (95% CI 0.04–0.19) a combination of bowel procedures (Table 2). All women in our study had histologic confirmation of bowel endometriosis.

Among the 20.3% (95% CI 0.16–0.25) of women without POD obliteration who required bowel surgery, the types of procedures performed included bowel shaving (69.4%, 95% CI 0.58–0.79), segmental wedge rectal resection (5.6%, 95% CI 0.02–0.13), segmental rectosigmoid resection (4.2%, 95% CI 0.01–0.12), segmental rectal resection (4.2%, 95% CI 0.01–0.12), appendectomy (4.2%, 95% CI 0.01–0.12), segmental sigmoid resection (2.8%, 95% CI 0.01–0.10), ileocecal resection (2.8%, 95% CI 0.01–0.10), perianal resection (1.4%, 95% CI 0.003–0.07), and a combination of bowel procedures (5.6%, 95% CI 0.02–0.13).

All women with POD obliteration required extensive adhesiolysis of the bowel from surrounding pelvic structures. Of the 42 women who did not require bowel surgery, four did not have any biopsy specimens taken, three of whom had visual diagnosis of rectal endometriosis without histologic confirmation of the disease. Of the remaining 38 women, endometriosis was histologically confirmed in 33 cases (86.8%, 95% CI 0.73–0.94) of the tissue specimens taken from the pelvis. The other five cases included adenomyosis from the posterior uterine wall confirmed in two, inflammatory change in one and two with normal peritoneal tissues.

POD obliteration was a significant predictor of bowel endometriosis, with an OR of 9.42 (95% CI 5.44–16.30). To a lesser degree, age (OR 0.96, 95% CI 0.94–0.99), infertility (OR 1.63, 95% CI 1.04–2.55), and prior surgery for endometriosis (OR 1.77, 95% CI 1.14–2.75) were also significant predictors of bowel endometriosis.

**Discussion**

The clinical and surgical implications of POD or cul-de-sac obliteration for women undergoing surgical treatment for endometriosis have received meager consideration in the literature. Redwine et al. [4] were among the first to draw attention to the clinical and surgical implications of this surgical entity when reporting a high risk of bowel surgery (73%) in a cohort of 84 women undergoing laparoscopic treatment of complete obliteration of the cul-de-sac associated with endometriosis. To the best of our knowledge,
this study is the first to estimate the odds ratio of having bowel endometriosis and bowel surgery in women undergoing laparoscopic treatment for endometriosis and pelvic pain with and without POD obliteration.

Our study found obliteration of the POD to be a significant predictor of bowel endometriosis, with an odds ratio of 9.42 (95% confidence interval CI 5.44–16.30). Surgery to deal with POD obliteration not only requires extensive adhesiolysis involving vital pelvic structures such as bowels, ovaries, and ureters, but also carries a one in two chance of requiring some kind of bowel surgery for intestinal endometriosis, which may range from shaving to disc resection and full segmental bowel resection [11]. In this study, nearly 60% of the women with POD obliteration required bowel surgery, compared with only 20% of those without POD obliteration (p < .001).

The prevalence of bowel endometriosis in our study is comparable to other studies from tertiary referral centers for severe endometriosis [4,14]. The incidence of full segmental rectal resections of 12% among the women with complete POD obliteration in our study is also comparable to that reported by Redwine et al. [4] of 15%. All women who underwent bowel surgery in our cohort were confirmed to have bowel endometriosis on histologic study. For the remaining women who had adhesiolysis but did not require bowel resection, there was histologic confirmation of endometriosis from tissues taken elsewhere in the pelvis, which suggests endometriosis as the likely cause of POD obliteration. Three women were noted to have rectal endometriosis but did not undergo bowel surgery. The reasons included bowel endometriosis being left in situ in one woman who underwent hysterectomy and bilateral salpingo-oophorectomy, one in whom bowel symptoms were absent or not significant, and one for whom the surgeon believed that further counseling was required before proceeding with bowel surgery.

The finding of POD obliteration should therefore be a major consideration for referring patients to dedicated centers for optimal care as stipulated by the European Society of Human Reproduction and Embryology [15]. Failure to diagnose and treat severe endometriosis has been shown to significantly increase the chances of requiring further surgery for symptom recurrence [16].

The ASRM made a clear distinction between partial and complete posterior cul-de-sac obliteration, assigning the former four and the latter 40 points [9]. Clearly, this assumes that an assessment of the pelvic cavity at the time of surgery is accurate and reliable. In this study, we selected the cohort of women with visual confirmation of complete POD obliteration and compared their surgical treatments with those without complete POD obliteration. Because we did not analyze the women into those with partial and complete POD obliteration, we are unable to shed any light or make any comment on the validity of the ASRM point assignment on the basis of the condition of the posterior cul-de-sac. However, we contend that the visual diagnosis of POD obliteration may be tricky and, hence, probably underestimated. Indeed, in some cases where the rectum was subtly adhered to the POD and uterosacral ligaments, the anterior rectum could be mistaken for the peritoneal surface of the POD itself. Obliteration of the normal boundaries of the POD and extensive rectovaginal endometriosis only became evident once the rectum was dissected away from the uterosacral ligaments and posterior vagina (Fig. 2).

Currently, the diagnosis of POD obliteration is only possible via a laparoscopy or laparotomy. Being able to predict and diagnose POD obliteration before surgery would give clinicians the opportunity to provide specific counseling regarding the nature and the potential morbidity associated with surgery. So far, various strategies with nonsurgical techniques have been made with varying success. Some studies have reported strong correlations between a history of non-cyclical chronic pelvic pain [17], dyspareunia [18], and dysmenorrhea [19] and the presence of POD obliteration. Others have reported associations between dyschezia [20] and, less commonly, cyclical rectal bleeding and the presence of deep infiltrative endometriosis involving the gastrointestinal tract, particularly the rectum and sigmoid [21].

Certain features from vaginal examination may alert the physician to the possibility of severe pelvic disease. For instance, localized tenderness in the POD has been shown to
to correlate with endometriosis affecting the POD and uterosacral ligaments [22], whereas a POD nodule was present in almost half of the women with POD obliteration [23]. A pre-operative tenderness or nodularity on pelvic examination is also predictive of symptom relief after aggressive surgical excision [4]. Others have found that CA-125 increases the sensitivity of the clinical examination for the detection of POD adhesions [24]. Imaging techniques, such as ultrasonography or magnetic resonance imaging may help in the diagnosis of POD obliteration before surgery [25, 26]. Bazot et al. [27] and Chapron et al. [28] demonstrated that at transvaginal or rectal endoscopic sonography, endometriosis nodules may appear as hypoechoic solid lesions with irregular borders. However, to our knowledge there are no studies specifically looking at the detection of POD obliteration with ultrasonography.

Conclusion

POD obliteration at laparoscopy carries a high risk of bowel endometriosis and bowel surgery. This risk is three times higher than for those without POD obliteration. Women with POD obliteration should be managed in tertiary referral centers for the treatment of endometriosis, where a multidisciplinary expertise and support is available. Further studies are needed to increase the detection of POD obliteration before surgery, thus, it is hoped, improving the triage and care of women with endometriosis and pelvic pain.

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References

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