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Infertile Women with Deep and Intraperitoneal Endometriosis: Comparison of Fertility Outcome According to the Extent of Surgery

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ABSTRACT **Study Objective:** This study was undertaken to ascertain whether the incidence of spontaneous pregnancy is increased in infertile women with deep and intraperitoneal endometriosis undergoing extensive surgery compared with those undergoing only intraperitoneal surgery.

Design: Retrospective case control study (Canadian Task Force classification II-1).

Setting: University teaching hospital.

Patients: Infertile women under the age of 40 years with deep and intraperitoneal endometriosis and no other associated major infertility factors. Only patients with at least 1 year of postoperative follow-up were included.

Interventions: Intraperitoneal surgery only (group 1) or extensive surgery (group 2) according to a shared decision-making approach.

Measurements and Main Results: Among the 34 women in group 1, 6 became pregnant, compared with 8 of the 41 women who had extensive surgery (12-month cumulative probabilities, 24.8% and 11.4%, respectively, and 24-month cumulative probabilities, 24.8% and 23.2%, respectively; $p = .82$). Perioperative surgical complication rate was higher in group 2 (6/41 versus 0/34; $p = .02$).

Conclusion: Extensive surgery for intraperitoneal and deep endometriosis in infertile women does not modify global fertility outcome but is associated with a higher complication rate. Journal of Minimally Invasive Gynecology (2011) 18, 622–628

Keywords: Infertility; Deep endometriosis; Intraperitoneal endometriosis; Conservative surgery; Extensive surgery

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Endometriosis may be associated with infertility even if a cause and effect relationship has not been established. In particular, intraperitoneal endometriosis can be involved in infertility since associated lesions can impair oocyte release or inhibit ovum pickup or transport, ovum capture, and normal cumulus-fimbria interaction [1,2]. For these reasons, treatment of intraperitoneal endometriosis has been associated with a small but significant improvement in live birth rates [3,4]. The impact of deep endometriosis on infertility is more controversial because inflammatory effects on the pelvic environment are unlikely. The 2 locations of endometriosis (intraperitoneal and retroperitoneal) often coexist and management of patients with intraperitoneal and deep endometriosis raises unanswered questions. In particular, does excision of deep endometriosis improve fertility in the case of coexistent intraabdominal endometriosis? The impact of deep endometriosis on fertility has never been proven, and only one study compared reproductive outcome in infertile women according to the management (conservative surgery or expectant management) in the case of rectovaginal

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endometriosis [5]. The findings of that study suggest that conservative surgery for rectovaginal endometriosis in infertile women does not modify the reproductive prognosis [5].

Deep endometriosis may cause severe symptoms [6] but is sometimes less symptomatic and therefore less of an indication for extensive surgery for some patients because the desire for pregnancy may be their first request. Interestingly, it has been suggested that the frequency of noncyclic chronic pelvic pain is lower for women who were treated for infertility [7], but several studies have failed to reveal any clear relation between characteristics of the lesions and the pelvic pain symptoms [8,9]. Because the risk of perioperative complications is increased in radical surgery with colorectal resection in comparison with nonradical surgery [10] and considering the frequent requirement for colostomy in these cases, patients sometimes choose not to undergo radical surgery. Given this background, we sought to evaluate the effect of extensive endometriosis surgery (deep and intraperitoneal) by comparing the reproductive outcome in women operated on extensively with that in women operated on only for the intraperitoneal lesions.

The study was conducted according to an informed and shared medical decision-making approach [11,12]. Shared decision-making includes some of the after components: establishing a context in which patients' views about treatment options are valued, transferring technical information and eliciting patients' preferences [13].

We focused only on infertile woman without associated infertility factors and only spontaneous pregnancy rates were studied. We chose not to include the results of assisted reproductive technologies (ART) to limit bias and also to evaluate the possible impact of deep endometriosis on fertility.

Materials and Methods

We considered consecutive women under the age of 40 years with intraperitoneal and deep endometriosis operated on in our institution, between April 2000 and November 2008, who had tried to conceive without success for 12 months or longer and had no other obvious cause of infertility. The diagnostic workup included ovarian reserve evaluation (i.e., anti-Mullerian hormone, follicle-stimulating hormone and estradiol serum testing on day 3 of the cycle), hysterosalpingography, and semen analysis of the partner. The study protocol was reviewed and approved by the national Institutional Review Board (2010–019). Only patients with a 1-year minimum follow-up time were included.

Women with persistent anovulation, bilateral tubal occlusion, or severe dyspermia of the partner ($<10 \times 10^6$ sperm/mL, $<30\%$ progressive motility, and $<15\%$ typical structure) were excluded, as were those who planned to undergo in vitro fertilization–embryo transfer immediately after surgery.

All patients had histologically proven intraperitoneal endometriosis. The diagnosis and location of deep endometriosis was based on vaginal and rectal examinations, magnetic resonance imaging (MRI), and transvaginal and transrectal ultrasonography. Deep endometriosis was demonstrated histologically on a pathologic specimen if the patient underwent resection of subperitoneal endometriosis.

During the preoperative consultation, each patient was asked to indicate the presence and severity of dysmenorrhea, deep dyspareunia, nonmenstrual pelvic pain, and dyschezia graded with an interview-based questionnaire (10-point analogue rating scale; 0 = absent, 10 = unbearable).

The information process was conducted according to the 7 criteria of Braddock et al [11] as previously described for surgical management of endometriosis [5]. On the basis of this approach, a shared decision was taken on whether to perform intraperitoneal surgery (group 1) or extensive surgery (group 2). Therefore the selected therapeutic measure was not randomized but in accordance with the patient's preference. Eligible subjects were informed that there is no evidence supporting the efficacy of extensive surgery as a fertility-enhancing procedure in patients with deep endometriosis, and that radical procedures could be technically difficult, associated with a limited risk of major complications such as ureteral and bowel lesions, pelvic abscess, and rectovaginal fistulas [14–17]. It was explained that no consistent data are available to compare the reproductive prognosis in extensively and partially operated women with both intraperitoneal and subperitoneal endometriosis.

Both types of surgery were initially performed at laparoscopy by the same surgical team, including 3 experienced operators (2 gynecologic surgeons and a digestive surgeon) with the same surgical techniques for resection of subperitoneal endometriosis when performed. Each procedure was performed with a 10-mm laparoscope in the umbilical position and 3 trocars. During the laparoscopic approach, the first step was exploration of the peritoneal cavity and staging of the endometriosis according to the revised American Society for Reproductive Medicine classification of endometriosis (1996) [18]. When present, adnexal adhesions were removed. Complete excision or coagulation of all visible endometriosis lesions from healthy tissue was performed with 5-mm bipolar scissors, according to the technique described by Redwine [19]. In the extensive surgery group, when endometriosis invaded the bowel, laparoconversion and colorectal resection were always performed (i.e., full-thickness disc excision or shave/superficial excision was never performed).

In patients with advanced-stage endometriosis who had undergone ovarian surgery several times before, ethanol sclerotherapy was used to avoid ovarian reserve reduction caused by normal ovarian tissue removal [20]. The procedure was performed as previously described [21].

The patients were invited to conceive without delay after the first postoperative consultation, 1 month after surgery. Because of unclear data concerning the value of postoperative GnRH analogue after conservative surgery for endometriosis at the beginning of the study, patients could receive leuprolide acetate depot (3.75 mg) for 3 months. After surgery, 7 and 9 patients received leuprolide acetate depot in