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Case Report

Pregnancy following robot-assisted laparoscopic partial cystectomy and gonadotropin-releasing hormone agonist treatment within three months in an infertile woman with bladder endometriosis

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ABSTRACT

Objective: To report an infertility case of deep-infiltrating bladder endometriosis conceiving following robot-assisted surgery and modified gonadotropin-releasing hormone agonist (GnRHa) treatment.**Case report:** A 33 year-old infertile female presenting with dysmenorrhea was found to have a bladder mass by pelvic ultrasound. Cystoscopy revealed a protruding tumor from the posterior bladder wall, and endometriosis was highly suspected. Robot-assisted laparoscopic partial cystectomy was performed for the deep-infiltrating bladder endometriosis. With postoperative half-dose GnRHa treatment and timed intercourse, she got pregnant within 3 months.**Conclusion:** Robot-assisted complete resection of deep-infiltrating endometriosis and bladder repair immediately followed by GnRHa therapy and medical assistance improves reproductive outcomes efficiently in women with endometriosis-associated infertility.© 2018 Taiwan Association of Obstetrics & Gynecology. Publishing services by Elsevier B.V. This is an open access article under the CC BY-NC-ND license (<http://creativecommons.org/licenses/by-nc-nd/4.0/>).

Introduction

Endometriosis is a benign disease defined as endometrial tissue implanting outside the uterine cavity and often causes dysmenorrhea, pelvic pain, dyspareunia and infertility. The prevalence of endometriosis has been reported in up to 50% of infertile women [1]. Distorted pelvic anatomy secondary to pelvic adhesions and increased inflammation adversely impacting the peritoneal environment contribute to endometriosis-associated infertility [2,3].

Deep-infiltrating endometriosis (DIE) is a complex form of endometriosis which may involve rectovaginal septum, uterovesical fold and bladder. It is believed that DIE has more aggressive behavior and more detrimental effects on fertility in comparison to ovarian endometrioma or superficial peritoneal endometriosis [4]. Both the American Society for Reproductive Medicine and the

European Society of Human Reproduction and Embryology (ESHRE) recommend operative laparoscopy to increase spontaneous pregnancy rate for women with stage III/IV endometriosis [3,5]. However, there is no consensus about the therapeutic strategies of DIE to improve fecundity [5]. Here we report an infertility case of deep-infiltrating bladder endometriosis conceiving efficiently following robot-assisted surgery and modified gonadotropin-releasing hormone agonist (GnRHa) treatment.

Case report

A 33-year-old, gravida 1, para 0, woman with failure to conceive for 5 years presented to our infertility center for counseling. She had regular menstruation and dysmenorrhea without menorrhagia, hematuria or dysuria. The levels of anti-Mullerian hormone, CA-125, CA19-9 and CEA were 2.77 ng/mL, 20.81 U/mL, 37.65 U/mL and 2.05 ng/mL, respectively. Semen analysis excluded male factor-related infertility. Hysterosalpingography showed no occlusion of bilateral fallopian tubes. A 3-cm bladder mass was found by ultrasound (Fig. 1A). Cystoscopy performed by the urologist revealed

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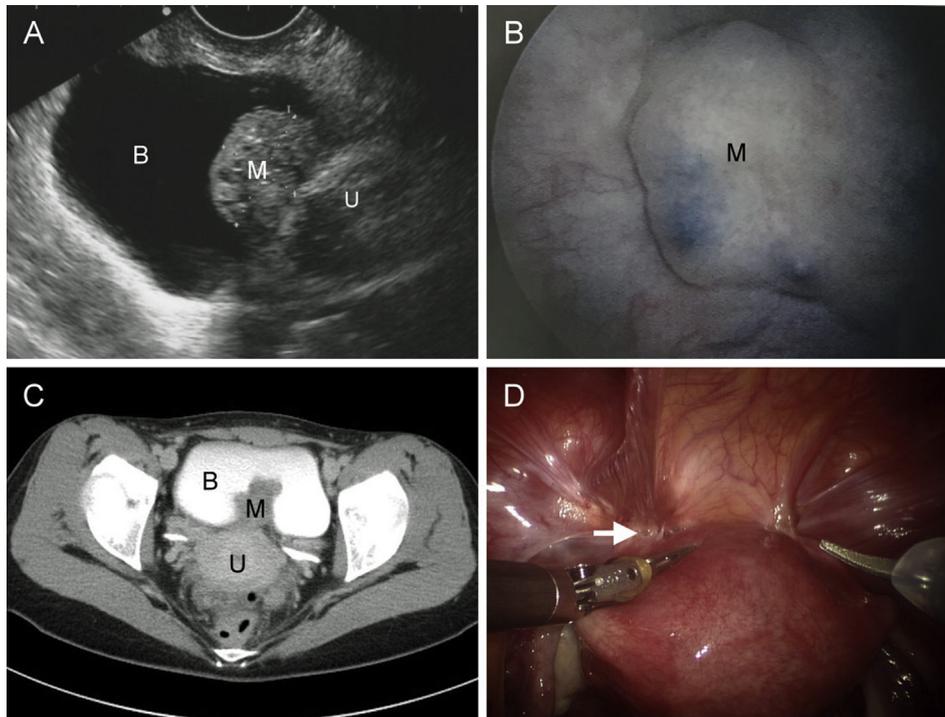


Fig. 1. (A) Transvaginal ultrasound showed a heteroechoic mass lesion (M) in the bladder (B). (B) A bladder mass (M) on the bladder wall was found by cystoscopy. (C) Pelvic computed tomography showed a lobulated tumor (M) in the posterior wall of urinary bladder (B) abutting to the anterior wall of the uterus (U). (D) Laparoscopy revealed extensive deep infiltrating endometriosis with obliterated uterovesical fold (white arrow).

a protruding tumor from the posterior bladder wall (Fig. 1B), and endometriosis was highly suspected. Computed tomography showed a lobulated neoplasm of 3.14×2.6 cm in size in the posterior wall of bladder abutting to the uterus (Fig. 1C). She underwent laparoscopy using the da Vinci® Si Surgical System (Intuitive Surgical, Inc., Sunnyvale, CA, USA), and extensive DIE between the anterior uterine wall and the bladder was found after incision of the obliterated uterovesical fold (Fig. 1D). Following careful dissection and resection of the endometriotic lesion with monopolar cautery spatula and bipolar forceps, the posterior wall of the bladder was exposed, and the protruding tumor was clearly visualized after incision into the bladder. Then partial cystectomy with complete excision of the tumor was performed, and the incision wound was closed with continuous two-layer suturing using a 2-0 absorbable coated polyglactin-910 suture and a 3-0 absorbable unidirectional barbed suture. Bladder distension without leakage was confirmed immediately, and an indwelling urinary catheter was left in place. There were no other visible endometriotic lesions in the pelvis. The operation time was 252 min, and estimated blood loss was less than 100 mL. She recovered well without any complications. Endometriosis with hemorrhagic cysts including the well-differentiated endometrial glands and stroma embedded in the mucosa and muscular layer of the thickened bladder wall was proved by pathological examination. The immunohistochemical staining showed positive CD10, PAX8 and ER. She received postoperative GnRHa treatment with leuprolide acetate depot of 1.875 mg 5 days later, and the urinary catheter was removed 10 days postoperatively with minimal post-void residual urine. The postoperative CA19-9 level was 26.43 U/mL. During the period waiting for wound healing, the second dosage of leuprolide acetate depot (1.875 mg) was injected one month after the first treatment. Medically-assisted timed intercourse followed and resulted in a successful pregnancy within 3 months.

Discussion

A multicentric study found that 21% of patients with DIE were infertile and the mean duration of infertility was 3 years [6]. However, the prevalence of bladder endometriosis in infertile women has not been reported in the literature. To our knowledge, this is the first report of conceiving by medically-assisted timed intercourse on the first attempt following robot-assisted laparoscopic partial cystectomy and half-dose GnRHa treatment in an infertile woman with bladder endometriosis. Robotic surgical system makes laparoscopic resection of bladder endometriosis and bladder repair more delicate and safer. Patients with endometriosis-associated infertility may achieve pregnancy earlier and easier with adjuvant GnRHa treatment and medical assistance immediately after surgical excision of DIE.

One retrospective study demonstrated that dysmenorrhea was the most common complaint in patients with bladder endometrioma and only 40% had urinary symptoms [7]. Because 50% of women with DIE have chronic pelvic pain [8], it is difficult to predict underlying bladder endometriosis if they are asymptomatic or only with dysmenorrhea like our present case. For those with hematuria, dysuria, tenesmus, diarrhea or dyschezia during menstruation, ESHRE recommends that clinicians should assess ureter, bladder and bowel involvement by additional imaging modalities if there is a suspicion of DIE, in preparation for further management [5].

Laparoscopic surgery for the treatment of endometriosis has been proven effective in reducing pain and increasing live birth or ongoing pregnancy rate (OR 1.94, 95% CI 1.20 to 3.16) and clinical pregnancy rate (OR 1.89, 95% CI 1.25 to 2.86) compared with diagnostic laparoscopy [9]. Although conservative surgery with laparoscope was recommended for infertile women with stage III/IV endometriosis without other identifiable infertility factors [3],

the published data regarding surgical management of DIE-associated infertility is varied [5,7,10–12]. Bianchi et al. reported that infertile women receiving extensive laparoscopic excision of DIE before IVF had significantly higher pregnancy rates compared with those without surgery (41% versus 24%) [10]. Centini et al. found that 54.78% of patients conceived by either spontaneous conception or assisted reproductive technology (ART) within 2 years after laparoscopic excision of DIE and concluded that surgical treatment of endometriosis in young patients with severe disease was beneficial in enhancing both pregnancy and live birth rates [11]. Nevertheless, a cohort study of 177 patients with DIE-related infertility demonstrated that surgery for DIE did not improve pregnancy and birth rates of IVF [12]. The authors thought that difficult access to the ovaries might contribute to the failure in IVF. Various disease locations in the above studies may be responsible for the confounding results. Recently, one study focused on the reproductive outcomes in women who underwent laparoscopic resection of bladder endometriosis [7]. During a follow-up for at least 36 months, 80% of the patients were completely asymptomatic after the surgery, and 35 of the 42 patients (83.3%) conceived after surgery, including 16 patients conceived spontaneously and 18 patients conceived after IVF treatment. The reproductive outcomes seem favorable following surgical treatment of bladder endometriosis.

Although laparoscopic excision is feasible in bladder endometriosis, DIE lesions complicate the procedure and raise the safety concern. The intraoperative complication rate of 0–2.6% and the postoperative complication rate of 7.8%–19% were reported in the literature [11,13]. A balance between the benefits and the risks of aggressive surgery should be weighed. The revolution of robotic technology offers surgeons improved ergonomics, three-dimensional visualization, greater precision, fine instrumentation and a shorter learning curve and overcomes the limitations of conventional laparoscopy. It has been applied widely in many surgical fields and showed superiority in complicated gynecologic diseases [14]. Early publications have demonstrated the feasibility of robot-assisted laparoscopy for DIE involving bladder and showed comparable outcomes with conventional laparoscopy for treating endometriosis [15–17]. A multicentric study retrospectively investigated the perioperative outcomes in patients with DIE undergoing robot-assisted laparoscopy [6]. The study included 164 patients, and 74 patients (45.1%) needed multiple surgical procedures for at least two locations of DIE. In the 23 cases of bladder endometriosis, the operative time was 207.2 ± 85.5 min, and blood loss was 57.6 ± 251.8 mL. Two main complications were vesicovaginal hematoma and temporary voiding dysfunction requiring intermittent self-catheterization for 6 months. In our case, due to the critical alterations on hormonal function and immunological factors of DIE [4], complete resection of the endometriotic lesion including the part infiltrating into the anterior uterine wall is the key to successful conceiving. Additionally, delicate suturing to prevent urine leakage from the bladder wound is still one of the advantages of robot-assisted laparoscopy.

Previous studies have demonstrated the positive impact of surgery on pregnancy rates in infertile women with DIE, but unfortunately, many women still failed to conceive. GnRHa can remarkably down-regulate inflammatory proteins in peritoneal fluid of women with endometriosis [18], and the response to GnRHa treatment is better in patients with well-differentiated endometriosis than those with undifferentiated endometriosis [19]. A Cochrane review has showed that a prolonged use of GnRHa for 3–6 months prior to ART enhances pregnancy rates [3,5,20]. Dechanet et al. also presented that two thirds of patients of stage III/IV endometriosis undergoing a combination of surgery and ART

became pregnant with an average interval between surgery and pregnancy of less than 2 years [21]. However, due to various study designs and inclusion criteria, the golden window of conceiving after surgical treatment and the ideal dosage and duration of adjuvant GnRHa therapy are unknown. In addition, although IVF remains the most efficient and successful means of overcoming endometriosis-associated infertility, the data about the effectiveness of medically-assisted reproduction following a combination of surgery and GnRHa therapy for infertile women with DIE are scanty. In our presenting case, administration of GnRHa not only suppressed residual disease but also improved the pelvic environment altered by endometriosis. After we prescribed two courses of GnRHa therapy only in half of dosage (1.875 mg) monthly before timed intercourse, she had a successful pregnancy within 3 months. The combination of complete resection of DIE and modified GnRHa therapy can help infertile women to get pregnant earlier in an easier way.

Conflicts of interest

The authors have no conflicts of interest relevant to this article.

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