

Management of bladder endometriosis with combined transurethral and laparoscopic approach. Follow-up of pain control, quality of life, and sexual function at 12 months after surgery

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Summary

To describe the pre-surgical and post-surgical outcomes at one year in terms of recurrence of lower urinary tract symptoms, quality of life, and sexual function of a transurethral and laparoscopic combined approach in the treatment of bladder endometriosis. The authors performed a prospective observational study of 16 women affected by symptomatic bladder endometriosis at the University Hospitals of Cagliari, Padua, and Foggia. In all patients bladder nodule was excised with a transurethral and laparoscopic combined approach technique. Intensity of lower urinary tract symptoms (VAS score) were assessed pre- and post-operatively at one, six, and 12 months after surgery; quality of life (SF-36) and sexual functions (FSFI) were collected preoperatively and one year postoperatively. Operative time was 120.18 ± 15.77 minutes and mean blood loss was 65.12 ± 44.74 . No intraoperative and postoperative complications and conversion laparotomy occurred. Intensity of lower urinary tract symptoms evaluated with VAS score were significantly lower after one, six, and 12 months postsurgery vs. presurgery ($p < 0.001$). The authors observed a significantly improvement in the quality of life and sexual functions in all patients at one year after surgery. This surgical approach is safe and simple in the treatment of bladder endometriosis, with low risks and optimal resolution of symptoms, and improvement of quality of life and sexual function.

Key words: Bladder endometriosis, quality of life, sexual function, pain control.

Introduction

Endometriosis is a disease that affects about 6-10% of the female population; it consists in the presence of endometrial tissue outside the uterine cavity. It is present in 35-50% of women with pelvic pain or infertility [1-3]. Etiology and pathogenesis of endometriosis is controversial and several theories have been proposed: according to three main theories, it may develop as a result of menstrual transtubaric reflux of endometrial cells which implant on the bladder dome, by extension of nodules adenomyosis from the uterine wall at the front bladder, or by metaplasia of Müllerian residues in the vesico-uterine septum [4-10].

The detection of endometriosis in the urinary tract is rare; an incidence of 1% in women affected by endometriosis was reported [1-3, 11, 12]. Bladder endometriosis in 30% of cases have no symptoms and the diagnosis is casual, while in the remaining 70% it is symptomatic and the symptomatology shows dysuria, tenesmus, change in urination frequency, burning, suprapubic pain, and less frequently, hematuria. The differential diagnosis includes recurrent cystitis, overactive bladder, bladder cancer, and interstitial cystitis. Bladder endometriosis is often connected with other localizations of pelvic endometriosis, hence it cannot be regarded as an independent form of the disease [13, 14]. Also, deep endometriosis is correlated to a significant impact on women's sexuality; according to recent studies, it was observed that women with deep endometriosis have sexual function damage and to a progressive reduction in quality of life and sexual satisfaction [15, 16].

The aim of this prospective study was to evaluate urinary tract symptoms pre-surgery and one, six, and 12 months after surgery; quality of life (SF-36) and sexual function preoperatively and one-year postoperatively in patients undergoing laparoscopic surgery for bladder endometriosis.

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Materials and Methods

Between January 2008 and December 2010, a prospective observational study, whose purpose was to examine the cases of 16 patients, treated at the University Hospitals of Cagliari, Padua, and Foggia, because of symptomatic bladder endometriosis.

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Preoperatively patients were subjected to a thorough clinical assessment by medical history, pelvic examination, transvaginal ultrasound [17, 18], hysteroscopy and endometrial biopsy [19, 20], MRI, cystoscopy, and each patient was requested to complete a questionnaire on quality of life (SF-36) and sexual functions (FSFI). Urinary tract symptoms (pain, dysuria) were collected using VAS score.

Transvaginal ultrasound was performed preoperatively and one month postoperatively. Bladder nodule volume was calculate using the prolate ellipsoid formula ($L \times H \times W \times 0.53$).

Presurgery and at one, six, and 12 months after surgery, lower urinary tract symptoms (VAS score) were evaluated. Quality of life and sexual function were evaluated preoperatively and at 12-months postoperatively.

Operative data such as blood loss, operative time, and complications were recorded. At one, six, and 12 months after surgery, all patients underwent a pelvic examination and transvaginal ultrasound.

Lower urinary tract symptoms (LUTS) was evaluated by using a ten-cm visual analogue scale [21]. The definition LUTS includes all conditions of irritation and pain, acute and chronic, of the genitourinary sphere, including hematuria, pollakiuria and dysuria, non-microbial cystitis, and recurrent urinary tract infections [22].

The authors assessed quality of life with the Medical Outcomes Survey Short Form 36 (SF-36) which is the most widely used generic instrument to evaluate health-related quality of life. It is a self-administered questionnaire accepted for the assessment of quality of life; it consists of 36 questions and eight subscales focusing on the evaluation of elements of physical and mental health. For the purpose of the study, the authors used four subscales related to the physical health and four inherent mental health (respectively physical functioning, role physical, bodily pain, general health vitality, social functioning, emotional role, and mental health). The total score is the sum of the scores obtained with the subscales. In all scales examined, the highest score corresponds to better physical and mental health [23].

The female sexual function index (FSFI) is a 19-item self-report instrument providing scores on six domains of sexual function. These domains include the following: desire (two items, questions 1–2), arousal (four items, questions 3–6), lubrication (four items, questions 7–10), orgasm (three items, questions 11–13), satisfaction (three items, questions 14–16), and pain (three items, questions 17–19). The sum of the 19 items provides the total FSFI score. Points given for each topic changed between 0 and 5 and the score was calculated using multipliers of the factors. A total score of 26.55 has been used as the cut-off for clinical SDF in previous studies [24]. The authors treated these patients with a partial cystectomy that was performed with combined approach - transurethral and laparoscopic according to Litta technique [25]. All patients were informed about the surgery and signed a consent.

Surgery

The surgical procedures were performed with the patient under general anesthesia. The first step of surgery consisted of a cystoscopy with a 5.2-mm continuous-flow endoscope with a 30° optic and an operative channel of 5 F that allows passage of a 0.6-mm diameter and three-mm long bipolar electrode. The cystoscopy, performed under continuous flow of saline solution, allowed the authors information about the node's location, size, and its location with respect to the ureteral ostia. They defined just the edges of the nodule via cystoscopy, with a free margin of two to three mm, and entered the bladder wall in one lateral edge, at three or nine o'clock positions, for a length of two cm, without transfixing into the bladder peritoneum.

Table 1. — *Characteristics of patients.*

Age (years)	29.12±4.33
BMI (kg/m ²)	21.13±1.49
Nodule size (US-cm ³)	5.26±2.21
Operative time (min)	120.18±15.77
Blood loss (ml)	65.12±44.74
Intraoperative complications	0
Postoperative complications	0

Data values are mean ± SD. US: ultrasonographic.

Table 2. — *Preoperative and postoperative (at one, six, and 12 months after surgery) lower urinary tract symptoms with VAS (Visual analog score) score.*

	Presurgery	1 month	6 months	12 months
VAS	7.9±1.3	5.2±1.3*	3.2±2*	1.3±0.5*

Data values are mean ± SD. Statistical significance was determined to be $p < 0.05$.

* Pain score was significantly lower after one, six, and 12 months postsurgery vs. presurgery ($p < 0.001$).

After cystoscopy, a laparoscopy was performed through the introduction into the abdomen using four trocars: one 11-mm trocar through the umbilicus for the camera and three five-mm ancillary trocars. The complete laparoscopic procedure was performed using a Harmonic ACE set a level 5. Initially, the authors started with the cutting of the bladder peritoneum in the site where the incision to the bladder wall was done by cystoscopy at one lateral edge of the nodule. Once the bladder hole was visualised, the authors continued to resect with excising the entire nodule, while following the guide they already made with the bipolar electrode.

The repair of the bladder was carried out with continuous 3-0 monofilament two-layer suture by intracorporeal knots. The resected nodule of bladder was removed by endocatch through the umbilical trocar. The bladder integrity was proved at the end of the procedure with insertion of methylene blue via a catheter into the bladder. A Foley catheter was held in bladder for seven days after surgery. All patients were discharged the day after the procedure with Foley catheter in place, elucidating the patient how to care for it, and a daily of nitrofurantoin a 100 mg capsule per os for seven days.

Statistical analysis

Values for continuous variable are mean ± standard deviation. Continuous data were analyzed by Anova test. The χ^2 and Fischer's exact tests were used to compare proportions in different groups. $p < 0.05$ was considered statistically significant.

Results

Characteristic of patients are reported in Table 1. Operative time was 120.18 ± 15.77 minutes and blood loss was 65.12 ± 44.74 ml. No intraoperative and postoperative complications occurred. All the procedures were completed laparoscopically and no conversion to laparotomy was required. Urinary tract symptoms (VAS score) are summarized in Table 2. Reduction of pain was statistically significant at one, six, and 12 months after surgery compared to preoperative

Table 3. — *SF-36 presurgery and 12 months after surgery.*

SF-36	Presurgery	12 months after surgery	p-value
Physical functioning	58.13±27.34	72.53±24.03	<0.0001
Role limitations resulting from physical problems	30.31±38.91	53.70±44.53	<0.0003
Bodily pain	57.04±22.37	72.79±20.63	NS
General health perception	60.79±20.93	63.3±22.43	<0.00021
Vitality	48.36±23.31	60.37±21.60	<0.0013
Social functioning	72.38±26.00	83.55±21.87	NS
Role limitations resulting from emotional problems	64.13±42.63	71.6±39.42	<0.03
General mental health	75.65±16.60	79.26±15.34	<0.004

Data values are mean ± SD. Statistical significance was determined to be $p < 0.05$.

Table 4. — *Preoperative and postoperative (at 12 months after surgery) FSFI score.*

	Presurgery	12 months	p-value
Desire	3.9±0.68	4.7±0.51	<0.001
Lubrication	4.2±0.57	4.4±0.34	<0.001
Arousal	4.3±0.54	4.5±0.65	<0.001
Orgasm	4.5±0.54	4.7±0.45	<0.001
Pain	4.4±0.49	5.1±0.35	<0.001
Satisfaction	4.4±0.55	4.7±0.28	<0.001
Total score	26.2±2.5	28.2±1.7	<0.001

Data values are mean ± SD. Statistical significance was determined to be $p < 0.05$.

symptoms. Table 3 shows quality of life results evaluated by the SF-36. At one year follow up, patients showed significant improvement in physical function ($p < 0.01$), in general health ($p < 0.00021$), in physical ($p < 0.0003$) and emotional roles ($p < 0.03$), in mental health ($p < 0.004$), and vitality ($p < 0.0013$), in comparison to baseline (pre-surgery). Six domains and total score of sexual function were all statistically significant improved at 12 months after surgery compared with sexual function before surgery (Table 4). In all 16 cases, the diagnosis of endometriosis of the bladder was confirmed by histological examination.

Discussion

Only less than 4% of women with endometriosis have urinary involvement mainly of the bladder [26]. The predominant symptoms of bladder endometriosis is pelvic pain, although the pathogenesis is not well understood and many women with endometriosis may have no pain symptoms. The pain is most often cyclic, but may also be chronic in nature. It usually begins just before menses and is continuous throughout the duration of menstrual flow. Dysuria is a less common symptom and is associated with bladder endometriosis. Pain may also be perceived in musculoskeletal regions, such as the flank, low back or thighs [27].

Preoperative questioning is important in the search for bladder endometriosis and the presence of the nodule is one of the few reliable criteria in preoperative assessment that can suggest bladder involvement [17–20]. Endometriosis is often diagnosed with great delay, contributing to psychological symptoms such as frustration and sense of guilt. The patient begins to feel responsible for the pain, and at the same time the disease reduces her ability to work and worsens social and family relationships and sexual life.

The complexity of deep endometriosis is not only linked to the symptoms manifested, but in recent years, numerous studies have demonstrated the effect of endometriosis on the quality of life (the disease might impair work capacity, social interaction, and family life) and sexual function [14–16].

Sexual disfunction may result in psychological symptoms, and sexual problems; if not treated, may cause depression. A combination of pain and depression can have a negative impact on the patient's quality of life and lead to dissatisfaction with sexual relationship [15].

Different approaches have been proposed until now in order to treat bladder endometriosis, especially conservative therapies, such as suppressive hormonal therapies, GnRH agonist, and androgens [6, 28–30]. However, medical therapy has been useful only to reduce the symptomatology, and after its interruption, surgical treatment is often necessary. Several surgical options have been recommended including hysterectomy, transurethral resection of the nodule, and partial cystectomy [31–39]. Although there are no randomized, controlled trials comparing the efficacy of the different surgical options, radical excision of the nodule has been described to be the treatment of choice for deep bladder endometriosis. A combined transurethral and laparoscopic approach to excise bladder endometriomas has been reported previously [25].

Bladder endometriosis is a rare condition and when it is symptomatic, a partial cystectomy is an effective option [32]. Laparoscopic resection of endometriotic nodules of the bladder may lead to a removal of healthy bladder, increasing the risk of postoperative complications and symptoms due to small bladder volume. Conversely, if the resection of the nodule is performed only by cystoscopic approach, the nodule would probably not be completely removed. Resectoscopic transurethral resection alone is no longer recommended because of the surgical risk and high recurrence rate. The combination of these two approaches allow to resect the endometriotic nodule completely, while avoiding the risk of excessive removal of healthy bladder [35–37]. Thus, when performed by experienced surgeons, the present authors consider the combination of cystoscopy and laparoscopic approach an effective and safe approach in the treatment of bladder endometriosis with improvement of pain, quality of life, and sexual function.

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