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Original Article

# Comparison of laparoscopic cystectomy and fenestration/cauterization procedures in terms of pelvic pain and recurrence in patients with endometrioma

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ABSTRACT

Objective: The objective of our study was to compare the efficacy of laparoscopic fenestration-cauterization and cyst excision in patients with ovarian endometrioma on dysmenorrhea, non-menstrual pelvic pain, dyspareunia, and dyschezia symptoms.

Materials and Methods: The study comprised 112 patients with endometrioma who underwent laparoscopic surgery and whose data could be obtained. In 76.8% (n=86) of the patients, laparoscopic cystectomy was conducted, and in 23.2% (n=26) of the patients, laparoscopic fenestration+cauterization were performed. The patients' preoperative examination findings and VAS (Visual Analog Scale) pain levels were retrieved retrospectively. Patients were contacted again during the study, VAS pain scores were recalculated, and a gynecological ultrasound scan was performed to check for recurrence. The collected data were analyzed comparatively.

Results: The mean age of the patients was 35.5 ± 6.8 years in the fenestration-cauterization group and 32.3 ± 5.9 years in the cystectomy group. 12.5% (n=14) of the cases were classified as stage I, 3.5% (n=4) as stage II, 32% (n=36) as stage III, and 52% (n=58) as stage IV. The operative time was significantly shorter in the fenestration+cauterization group compared to the cystectomy group (respectively/min 50.0±18.4 /61.3.±16.8, p=0.014). In both groups, the number of patients with dysmenorrhea, NMPP, dyspareunia, and dyschezia who had high VAS pain scores decreased significantly (p<0.005). In both procedures, there was no difference between recurrence rates (p=0.801). After surgical treatment, there was a significant decrease in the number of stage III-IV patients with dysmenorrhea and NMPP who had high VAS (p<0.005).

Conclusion: We emphasize the significance of laparoscopy in the surgical treatment of endometriosis. Both laparoscopic fenestration + cauterization and laparoscopic cystectomy significantly reduced pain symptoms, especially in patients with advanced endometriosis. The efficacy and recurrence rates of both treatments were not significantly different.

Keywords: endometriosis; endometrioma; pelvic pain; laparoscopic surgery; recurrence

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## Introduction

Endometriosis is an estrogen-dependent, progressive inflammatory disease caused by the growth of endometrium-like tissue outside the uterine cavity. It may progress with chronic pelvic pain, infertility, and organ dysfunctions. It affects 10-15% of women of reproductive age. The prevalence can reach 35-40% in women with a history of pelvic pain and/or infertility. The majority of patients have cyclic menstrual pain and occasionally non-cyclic pelvic pain, as well as dyspareunia, dyschezia, and dysuria [1-3]. The European Society of Human Reproduction and Embryology (ESHRE) introduced nonsteroidal anti-inflammatory drugs, hormonal therapies, and surgical treatment as alternatives for the treatment of endometriosis [4].

Medical treatment should be tailored to the individual and the goal is to suppress inflammation.

Medical treatment is rarely curative, and discontinuation has been linked to a 4-74% recurrence of symptoms [5,6]. Combined oral contraceptives, which are commonly utilized as first therapy, reduce both pain and postoperative recurrence. Medical therapy also includes progestins, GnRH analogs, aromatase inhibitors, and GnRH antagonists [1,7-8]. Surgical intervention may be required in the insufficiency of conservative treatments. In this case, the laparoscopic method should be prioritized [2]. Conservative methods such as excision or ablation of endometriosis foci, as well as radical surgical treatments such as hysterectomy and or oophorectomy, all depend on the patient's age, symptoms, desire for fertility, and the stage of the disease. Laparoscopic surgery has now become the gold standard in endometriosis surgery. Pain relief was reported in 87% of patients with

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endometriosis after laparoscopy surgery.
Within one year after laparoscopic surgery, 19% of patients experienced a recurrence of symptoms, and 8.6% of patients underwent re-operation [9-11].
The goal of our study was to examine the effectiveness and recurrence rates of laparoscopic fenestration-cauterization and cyst excision procedures on dysmenorrhea, non-menstrual pelvic pain (NMPP), dyspareunia, and dyschezia symptoms in ovarian endometrioma patients.

## Material and methods

In this study, 238 patients who underwent laparoscopic surgery for endometriosis at the Gynecology and Obstetrics Clinic of Izmir Tepecik Training and Research Hospital between January 2010 and May 2012 were evaluated retrospectively. The effects of surgery on symptoms of non-menstrual pelvic pain (NMPP), dysmenorrhea, dyspareunia, and dyschezia, as well as recurrence rates, were evaluated. Our retrospective study received the necessary approval from the hospital management. The study was designed and conducted in accordance with the ethical guidelines of the Declaration of Helsinki.
The patients' age, clinical information, surgical procedure, surgery notes, and pathology and laboratory findings were accessed retrospectively through the archive system and patient files. The study included patients who were at least 6 months post-operation. A total of 126 patients were excluded from the study, including 32 patients who did not have endometrioma during the operation, 24 patients who had oophorectomy, 4 patients who only had adhesiolysis, 18 patients who had open surgery during the operation, and 48 patients who could not be reached during the follow-up period. The study comprised 112 patients with endometrioma, 26 of whom had fenestration+cauterization and 86 of whom had cystectomy. The operation team determined the type of procedure to be used in each case based on the evaluation of the anatomical pelvic structure during the operation, the patients' symptoms, and the profit-loss account. All operations were performed using the laparoscopic procedure. Two ipsilateral and one contralateral 5-mm trocar, as well as one 11-mm umbilical trocar, were used. In the fenestration+cauterization procedure, a 1-2 cm ellipsoid window was opened in the cyst wall, the contents of the cyst were drained, and then the inner surface of the endometrioma was destroyed with bipolar cautery. The endometrioma was incised from the antimesenteric side during the cystectomy procedure, and the cyst capsule was resected from the normal ovarian tissue using atraumatic gripping forceps. For effective bleeding control, a 6-0 absorbent suture material was used when necessary. The endometriosis was staged using the revised American Fertility Society (AFS) classification [12]. Patients with a score of 1-5 were classified as stage I (minimal), patients with a score of 6-15 as stage II (mild), patients with a score of 16-40 as stage III (moderate), and those with a score of >40 as stage IV (severe). The patients' pain levels were assessed twice, before and after the operation, using the VAS (Visual Analog Scale), a simple and safe method. Patients were asked to rate their pain sensations from 0 (no pain) to 10 (worst pain) on a 10 cm long, equally spaced VAS, which can be horizontal or vertical, facilitated by visual content. The No pain-Mild pain group comprised patients with a VAS pain level of 4 or lower, whereas the Moderate-Severe pain group included patients with a VAS pain score of 5 or above. Patient records were used to acquire VAS pain scoring data, which was routinely done in our clinic before endometriosis surgery. Patients were contacted again for this study, and a gynecological ultrasound examination was performed to check for endometrioma recurrence, as well as a second VAS score to assess symptoms, and the data were compared.
In the descriptive statistics of the data, mean, standard deviation, ratio, and frequency were used.
The Kolmogorov-Smirnov test was used to evaluate the data distribution. Quantitative variables were compared using ANOVA (Tukey's test), Kruskal-Wallis test, independent sample t-test, and Mann-Whitney U test. Qualitative variables were compared using the chi-square test, and the Fisher test was used when the chi-square assumptions were not met. For repeated measurements, the paired sample t-test, Wilcoxon test, and McNemar test were utilized. Statistical analysis was performed using the SPSS 20.0 software.

## Results

The mean age of the patients was 35.5 ± 6.8 years in the fenestration-cauterization group and 32.3 ± 5.9 years in the cystectomy group. 12.5% (n=14) of the cases were classified as stage I, 3.5% (n=4) as stage II, 32% (n=36) as stage III, and 52% (n=58) as stage IV. The results indicated that 65.5% (n=76) of the patients had unilateral endometrioma and 34.5% (n=40) had bilateral endometrioma. In 76.8% (n=86) of the patients, cystectomy was performed, whereas in 23.2% (n=26) of the patients, fenestration+cauterization was performed. In comparison to the cystectomy group, the fenestration+cauterization group had a significantly lower operative time. For fenestration+cauterization and cystectomy groups, the mean postoperative follow-up duration was 31.2±14.7 and 30.4±11.0 months, respectively. (Table 1)

Table 1. Age, operative time, and follow-up duration

| | Type of operation | | |
|---|---|---|---|
| | Fenestration-Cauterization (mean±SD) | Cystectomy (mean±SD) | p |
| Age/year | 35.5± 6.8 | 32.3.±5.9 | 0.017 |
| Operative time/min | 50.0±18.4 | 61.3.±16.8 | 0.014 |
| Postop. follow-up duration/month | 31.2±14.7 | 30.4±11.0 | 0.439 |

In both the fenestration-cauterization and cystectomy groups, the number of patients with high VAS pain levels and dysmenorrhea, NMPP, dyspareunia, and dyschezia. (Table 2)

Table 2. The effect of the type of operation on the symptom

| | | | Type of operation | | | | p |
|---|---|---|---|---|---|---|---|
| | | | Fenestration-Cauterization | | Cystectomy | | |
| Dysmenorrhea | Preop | No - Mild | 8 | 30.8% | 7 | 8.1% | 0.003 |
| | | Moderate - Severe | 18 | 69.2% | 79 | 91.9% | |
| | Postop | No - Mild | 16 | 61.5% | 30 | 34.9% | 0.015 |
| | | Moderate - Severe | 10 | 38.5% | 56 | 65.1% | |
| | Difference p | | | 0.008 | | 0.000 | |
| NMPP | Preop | No - Mild | 10 | 38.5% | 19 | 22.1% | 0.095 |
| | | Moderate - Severe | 16 | 61.5% | 67 | 77.9% | |
| | Postop | No - Mild | 20 | 76.9% | 62 | 72.1% | 0.626 |
| | | Moderate - Severe | 6 | 23.1% | 24 | 27.9% | |
| | Difference p | | | 0.002 | | 0.000 | |
| Dyspareunia | Preop | No - Mild | 12 | 46.2% | 45 | 52.3% | 0.581 |
| | | Moderate - Severe | 14 | 53.8% | 41 | 47.7% | |
| | Postop | No - Mild | 20 | 76.9% | 64 | 74.4% | 0.796 |
| | | Moderate - Severe | 6 | 23.1% | 22 | 25.6% | |
| | Difference p | | | 0.008 | | 0.000 | |
| Dyschezia | Preop | No - Mild | 26 | 100.0% | 78 | 90.7% | 0.194 |
| | | Moderate - Severe | 0 | 0.0% | 8 | 9.3% | |
| | Postop | No - Mild | 26 | 100.0% | 86 | 100.0% | - |
| | | Moderate - Severe | 0 | 0.0% | 0 | 0.0% | |
| | Difference p | | | - | | 0.008 | |

The number of patients with high VAS pain levels, dysmenorrhea, NMPP, dyspareunia, and dyschezia symptoms decreased significantly after surgery in the advanced stage (Stage III and IV) disease group. Surgery was also shown to have a positive effect on dyspareunia in Stage I and II patients but had no effect on dysmenorrhea or NMPP. (Table 3)

Table 3. The relationship between endometriosis stage and postoperative clinical response

| | | | Stage I-II | | | Stage III-IV | | p |
|---|---|---|---|---|---|---|---|---|
| | | | n | % | | n | % | |
| Dysmenorrhea | Preop | No - Mild | 8 | 44.4% | | 8 | 8.5% | 0.000 |
| | | Moderate - Severe | 10 | 55.6% | | 86 | 91.5% | |
| | Postop | No - Mild | 12 | 66.7% | | 34 | 36.2% | 0.018 |
| | | Moderate - Severe | 6 | 33.3% | | 60 | 63.8% | |
| | Difference p | | 0.125 | | | 0.000 | | |
| NMPP | Preop | No - Mild | 8 | 44.4% | | 27 | 28.7% | 0.214 |
| | | Moderate - Severe | 10 | 55.6% | | 67 | 71.3% | |
| | Postop | No - Mild | 12 | 66.7% | | 72 | 76.6% | 0.431 |
| | | Moderate - Severe | 6 | 33.3% | | 22 | 23.4% | |
| | Difference p | | 0.125 | | | 0.000 | | |
| Dyspareunia | Preop | No - Mild | 10 | 55.6% | | 45 | 47.8% | 0.553 |
| | | Moderate - Severe | 8 | 44.4% | | 49 | 52.2% | |
| | Postop | No - Mild | 16 | 88.9% | | 70 | 74.5% | 0.160 |
| | | Moderate - Severe | 2 | 11.1% | | 24 | 25.5% | |
| | Difference p | | 0.031 | | | 0.000 | | |
| Dyschezia | Preop | No - Mild | 18 | 100.0% | | 90 | 95.1% | 0.588 |
| | | Moderate - Severe | 0 | 0.0% | | 4 | 4.3% | |
| | Postop | No - Mild | 18 | 100.0% | | 94 | 100.0% | - |
| | | Moderate - Severe | 0 | 0.0% | | 0 | 0.0% | |
| | Difference p | | - | | | 0.031 | | |

There was no significant difference in the mean follow-up duration between the groups.. Endometrioma recurrence rates were 7.7% after fenestration+cauterization and 9.3% after cystectomy, with no statistical difference between them. (Table 4)

Table 4. Recurrence rate by surgical methods

| | | Type of Operation | | | | p |
|---|---|---|---|---|---|---|
| | | Fenestratio Cauterization | | Cystectomy | | |
| Recurrent Endometrioma (n,%) | No | 24 | 92.3% | 78 | 90.7% | 0.801 |
| | Yes | 2 | 7.7% | 8 | 9.3% | |
| Postop. follow-up duration/month (mean±std) | | 31.2±14.7 | | 30.4±11.0 | | 0.439 |

## Discussion

Endometriosis is one of the primary causes of chronic pelvic pain in women of reproductive age [13]. The majority of the patients reported that the symptoms had been present for an average of 10 years and more than 60% of them reported that their complaints began before the age of 20. It has been shown that patients visit a doctor's office an average of 10 times before receiving the diagnosis [14]. Endometriosis can be efficiently treated with both pharmacological and surgical approaches [15,16]. The advancement and widespread use of laparoscopic technology is pushing the boundaries of endometriosis surgery, and it is currently suggested to prefer laparoscopy to open surgery for endometrioma surgery [17]. The effectiveness of laparoscopic cystectomy and fenestration + cauterization operations on dysmenorrhea, NMPP, dyspareunia, and dyschezia in endometrioma patients were compared in this study.

While the fenestration+cauterization operation took less time than the cystectomy method, both procedures were found to have a similar favorable effect on painful symptoms such as dysmenorrhea, NMPP, and dyspareunia. It was concluded that surgery had a much higher effect in reducing symptoms in advanced-stage cases, but had no effect in early-stage cases. The recurrence rates of both procedures were not significantly different.

Hemmings et al. reported that the laparoscopic fenestration-cauterization takes a shorter time than the cystectomy [18] . In the treatment of pelvic pain in endometrioma patients, Mourali showed that laparoscopic cystectomy is significantly superior to fenestration-cauterization [19]. Dan's meta-analysis, as well as Alborzi's prospective randomized study, emphasized that cystectomy was superior to fenestration-cauterization with a high efficacy on pain [20,21]. Surgical ablation decreases pain in cases of peritoneal endometriosis, according to another study, however, ovarian endometriomas larger than 3 cm should be removed [17]. In our study, fenestration-cauterization required a significantly shorter time than cystectomy. Although the cystectomy may be more challenging, we believe that the operative time will vary depending on the surgeon's experience. Although prior studies had shown that cystectomy was preferable, our study showed that both fenestration-cauterization and cystectomy had equivalent efficacy on symptoms of dysmenorrhea, NMPP, dyspareunia, and dyschezia and that both treatments delivered significant improvement.

Because of the diversity of the patient population, the ESHRE guideline on endometriosis refrains from offering recommendations on surgical strategy and technique. The guideline also states that there is no specific prognostic indicator that will allow the preselection of patients who will benefit from surgery[7]. Both medical and surgical treatment for pain in early-stage endometriosis has been shown to be equally beneficial in studies. Surgical treatment, on the other hand, has been demonstrated to be superior to medical treatment in the treatment and recurrence of chronic pelvic pain, dyschezia, and dyspareunia in cases of deep endometriosis [16]. Despite the fact that removal of endometriomas larger than 3 cm is suggested, some studies indicate that laparoscopic ablative surgery is an effective method for reducing pelvic pain in patients with Stage III-IV endometriosis with endometriomas [9,17]. In another study, although there was no correlation between the stage of the disease and the severity of pain, pelvic pain persisted at a higher rate after surgery in advanced-stage patients [22]. Our study showed that the severity of dysmenorrhea, NMPP, dyspareunia, and dyschezia symptoms were significantly reduced after surgery in stage III-IV patients, but there was no significant change in early-stage (stage I-II) cases. Since it is not possible to stage the disease precisely before surgery, we believe that laparoscopic surgery is inevitable in all patients with endometriosis who are resistive to medical treatment or who are infertile.

It has been reported that recurrence rates after cystectomy procedure with laparoscopic fenestration-cauterization were similar after 36 months [18]. In patients with endometrioma, however, some studies have found that laparoscopic cystectomy is significantly advantageous to fenestration-cauterization in terms of recurrence rates [17,19-21]. Endometriosis recurs at a rate of 19% within one year following laparoscopic surgery, and at 12.5% and 40-50%, respectively, in the second and fifth years, according to the literature, with re-operation conducted in 27-58% of the cases [9-11, 23,24]. There was no significant difference in recurrence rates after fenestration+ cauterization and cystectomy in our study over a mean follow-up period of more than 30 months, and our

recurrence rates, which were 7.7% and 9.3%, respectively, were found to be lower than the literature rates.
The retrospective design of our study is one of its limitations. However, because of the large number of patients treated in a tertiary center and the long follow-up period of more than 30 months after surgery, we believe it will contribute to the literature.

Conclusion

In endometrioma patients, fenestration+cauterization and cystectomy procedures performed using the laparoscopic procedure were not shown to be superior in terms of pain treatment, and both methods provided a statistically significant reduction in pain sensation. The recurrence rates of both operations were not significantly different. In stage III-IV patients, surgery resulted in a significant reduction in pain sensation; however, surgery was shown to be ineffective in stage I-II cases. Prospective studies on the long-term effects of surgery, in our opinion, are required.

## Disclosure

Authors have no potential conflicts of interest to disclose.

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