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Improvement of pain after Laparoscopic Ovarian Cystectomy of Ovarian Endometriomas versus Deroofing

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ABSTRACT

Background: Endometriosis is characterized by presence of ectopic endometrial glands and stroma outside uterine cavity. It presents with pelvic pain, dysmenorrhea, and infertility, affecting 7–10% of the general female population and up to 50% of women with infertility.

Objective: This study aimed to evaluate the effect on pain intensity following treatment of ovarian endometriomas using either deroofing or ovarian cystectomy.

Methods: This randomized experiment was conducted on 34 women who were eligible for laparoscopic surgery due to endometriomas. The patients were randomly assigned into two equal groups: Cystectomy group: complete removal of the whole cyst within the cyst wall and deroofing group by making a permanent opening at the cyst wall to permit drainage.

Results: At 8 weeks postoperatively, the studied groups were comparable in terms of percent change in VAS pain score compared to preoperative values, whereas at 6 months postoperatively, a statistically significant difference was observed, with the cystectomy group showing a significantly greater percent decrease in measures. At 8 weeks postoperatively, no patients had recurrence. The recurrence rates at 6 months postoperatively were comparable between the studied groups, with no statistically significant difference.

Conclusion: Ovarian cystectomy and deroofing methods were similar regarding recurrence 6 months postoperatively and VAS pain score preoperatively or 8 weeks postoperatively. Ovarian cystectomy and deroofing methods decreased VAS pain score 8 weeks and 6 months postoperatively. Cystectomy is regarded as the gold-standard surgical technique due to its lower risk of ovarian endometriomas (OMA) recurrence and endometriosis related pain.

Keywords: Pelvic pain, Laparoscopic ovarian cystectomy, Ovarian endometriomas, Deroofing.

INTRODUCTION

Endometriosis is characterized by the presence of endometrial glands and stroma in ectopic locations outside the uterine cavity.Infertility, dysmenorrhea, and pelvic pain are common symptoms of endometriosis, which affects 7% to 10% of women overall and up to 50% of infertile women [1].Between seventeen percent and forty-four percent of women who have endometriosis will develop endometriomas, which are cysts caused by ectopic endometrial tissue in the ovary [2].

Finding an effective treatment for ovarian endometriomas (OMA) in infertile females is a difficult task. It is still contentious to remove endometriomas surgically, yet it is normal practice [3]. Among the most important considerations is how endometriomas affect ovarian reserve and follicle loss [4].

It has been proposed that the severity of pelvic pain correlates with health-related quality of life (QOL) and mental health, since chronic pelvic pain, whether cyclical or non-cyclical, lasting at least 6 months, is the most common symptom of endometriosis and the main reason for treatment [5].

A major area of contention is the comparison of various surgical methods for the treatment of OMA[6].This work examined the impact on pain levels after OMA treated with deroofing vs ovarian cystectomy.

PATIENTS AND METHODS

This randomized experiment was carried out at Badr city's Helwan University Hospital, namely the Obstetrics & Gynaecology Department through the period from November 2022 to August 2024.Thirty-four women who were eligible for laparoscopic surgery due to endometriomas and whose primary symptom was pain were included.

Inclusion criteria: Unilateral endometriomas of 3 cm or more, prevalent in women aged 18 to 35 years, the primary symptom was persistent pelvic pain that had not responded to medications [non-steroidal anti-inflammatory drugs (NSAIDs), oral contraceptive pills (OCPs), levonorgestrel-releasing intrauterine device (IUD) and progesterone] after three months or decline pharmacological treatment altogether and who filled out the visual analogue score (VAS).

Exclusion criteria: Additional endometriosis patients who do not fulfil the inclusion criteria, patients who had any prior ovarian surgery and allergy or contraindication to Dienogest.

The patients were randomly assigned into two equal groups: **First group:** a laparoscopic ovarian cystectomy (complete removal of the whole cyst within the cyst wall) was performed to treat the endometriotic cyst.

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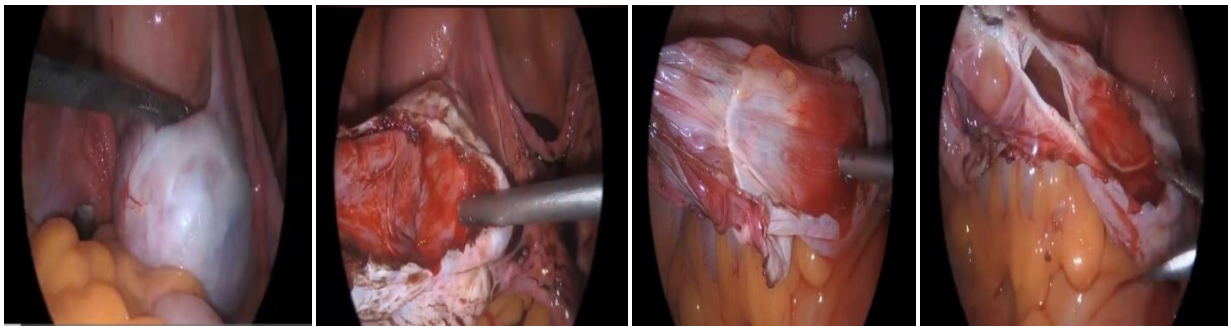
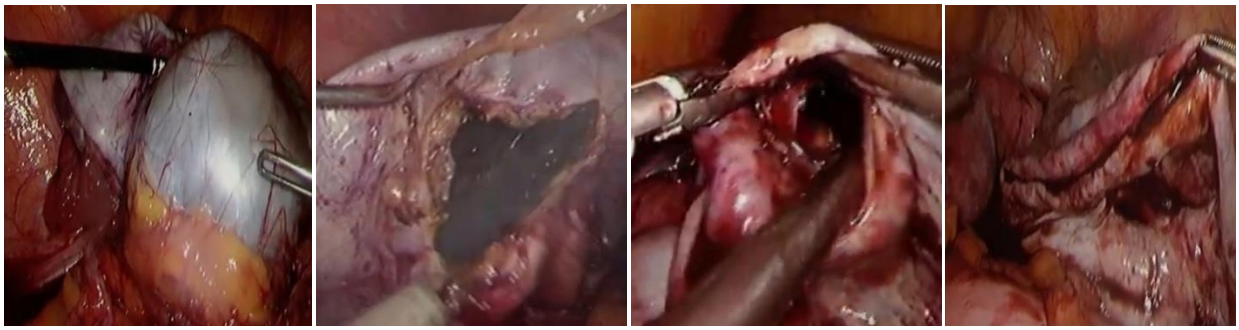


The second group women who had laparoscopic ovarian cyst deroofing (making a permanent opening at the cyst wall that permits the cyst to drain while maintaining ovarian function).



Method of sampling: We calculated that 17 patients in each group would have 90% power to detect a 1.28 mean difference in VAS scores (means of 3.13 versus 4.41), assuming a common within-group standard deviation of 1.10 and a significance level of $p < 0.05$, using a two-sided t-test. With a 15% drop-out rate assumed, 20 patients were divided into the fore mentioned two groups.

All patients were subjected to the following: Ultrasound and laparoscopy would be used to identify endometriotic cysts prior to surgery. The patient's medical history was carefully reviewed, including details on the beginning, progression, length, nature, radiation exposure, factors that exacerbate or alleviate the pain, past medications, and any diagnostic procedures.

Before surgery, patients filled out a visual analogue score to assess their dyspareunia, dysmenorrhea, and chronic pelvic pain. Proper diagnostic testing, including a full blood count (CBC), random blood samples, tests for liver and kidney function, a coagulation profile (PT, PTT, INR), and virology markers. Also, appropriate clinical exams, including vital signs, heart and chest conditions, and investigations.

This imaging investigation included a transvaginal ultrasound (TVUS) and a pelvi-abdominal ultrasound (PAUS). All women fasted 2 hours for clear fluid and 6 hours for light meal. In the operating room, every detail would be meticulously documented and archived.

Dienogest 2 mg once daily for three months after surgery would be administered to all patients in both groups. Patients would fill out a visual analogue score (VAS) questionnaire to assess their dyspareunia, dysmenorrhea, and chronic pelvic pain levels. At the same intervals after surgery, a TVUS would be done to detect any signs of disease return and to measure the size of any cysts that may have developed.

Our main goal was to evaluate the effectiveness of ovarian cystectomy compared to deroofing in terms of pain ratings for individuals suffering from OMA. Secondarily, we wanted to see how ovarian cystectomy stacks up against deroofing in terms of reducing recurrence rates for endometriomas of the ovary.

Ethical approval: The study protocol was approved by the ethical scientific committee of Helwan University Hospitals. Informed verbal and written consents were obtained from the patients before enrolment in the study. The study protocol adhered to the principles of the Declaration of Helsinki, the ethical standard of the World Medical Association for research involving human subjects.

Statistical analysis

Statistical analysis was done by SPSS version 26 (IBM©, Armonk, NY, USA). Quantitative parametric data were presented as mean and standard deviation (SD) and were analyzed utilizing t-test for independent samples. Qualitative variables were presented as frequency and percentage (%) and were analyzed utilizing the Chi-square test. A two tailed P value ≤ 0.05 was considered significant.

RESULTS

There was no statistically significant difference as regards age. In terms of VAS pain score before and after surgery, there was no statistically significant difference between the groups that were evaluated. When comparing pre- and post-operative VAS pain scores, there was a statistically significant reduction at 8 weeks and 6 months post-operative, but a statistically significant rise at 6 months post-operative for each group. No significant difference between the groups when comparing the percentage change in VAS score 8 weeks after surgery to the preoperative value. Six months after surgery, there was a statistically significant difference in the percentage reduction in VAS score compared to the preoperative value. The cystectomy group showed a considerably larger percentage drop (Table 1).

Table (1): Comparison between the studied groups regarding baseline data, VAS pain preoperative and postoperatively and percent change in VAS pain score at 8 weeks and 6 months postoperatively

	Cystectomy group	Deroofing group	p
Age (year)	29.59 ± 3.57	29.06 ± 3.11	0.648
VAS			
Preoperatively	7.06 ± 1.3	6.82 ± 1.55	0.648
8 weeks postop	1(0 – 1.5)	1(0 – 2)	0.898
6 months postop	2(1.5 – 3)	3(2 – 4.5)	0.088
P1	<0.001*	<0.001*	
P2	0.004*	<0.001*	
P3	<0.001*	<0.001*	
8 weeks postop	-85.7 (-100, -80%)	-88.9 (-100, -71.4%)	0.957
6 months postop	-71.43 (-81.7, -56.3%)	-55.6 (-69.0, -38.8%)	0.04*

Data is expressed as the mean ±SD or Median (IQR), p1 for the Wilcoxon signed rank test from before surgery to eight weeks after interval between 6 weeks and 8 months post-op for the Wilcoxon signed rank test Between the pre- and post-operative periods, *: significant P value.

No patients had recurrence at 8 weeks after the operation. When comparing the groups examined for recurrence, there was no statistically significant difference. Six months after surgery, recurrence was seen in one patient in the cystectomy group, measuring 4 cm in diameter, and in two patients in the deroofing group, measuring 5 cm in diameter, and in one patient measuring 6 cm in diameter (Table 2).

Table (2): Comparison between the studied groups regarding recurrence at 8 weeks and 6 months

	Cystectomy group	Deroofing group	p
	N=17 (%)	N=17 (%)	
At 8 weeks			
Absent	0 (0%)	0 (0%)	-
6 months			
Absent	16 (94.1%)	13 (76.5%)	0.335
Present	1 (5.9%)	4 (23.5%)	
Lesion			
Absent	16 (94.1%)	13 (76.5%)	
4 cm	1 (5.9%)	1 (5.9%)	0.091
5 cm	0 (0%)	2 (11.8%)	
6 cm	0 (0%)	1 (5.9%)	

$\chi 2$: Chi square test §Chi square for trend test.

DISCUSSION

Endometriosis affects between twenty percent and fifty percent of infertile people and is a prevalent gynaecological illness. Ovarian endometriomas, deep endometriosis (DE), and superficial peritoneal lesions (SUP) were all recognised as endometriosis phenotypes. Diagnoses of OMA often accompany those of pelvic discomfort and infertility, and the condition affects 17% to 44% of the population [7].

There is no statistically significant difference in age between the groups that were analysed, according to the demographic statistics. The average age of the deroofing group was 29.06 years old, whereas that of the cystectomy group was 29.59 years old. The 122 endometriomas patients randomly assigned to laparoscopic cystectomy (group 1) or laparoscopic cyst deroofing (group 2) in the research by **Sweed *et al.*** [8] are consistent with our findings. The age difference between the cystectomy and cyst deroofing groups was not statistically significant (P= 0.135). One hundred endometriomas-diagnosed women were also included in the study by **Mohamed *et al* .**[9].

There were two equal groups of patients: Those who had laparoscopic ovarian cystectomy and those who underwent laparoscopic cyst deroofing. According to **Mohammed *et al.***[9] there was no significant difference in age between the two groups (P= 0.290).

Regarding the VAS pain score before and after surgery, there was no statistically significant difference between the groups that were evaluated in this research. Within each group, there was significant decrease in VAS pain score 8 weeks and 6 months postoperatively as compared to preoperative level, while there was significant increase in VAS pain score when comparing 6 months with 8 weeks postoperatively. Statistical analysis revealed no significant difference between the groups when comparing the percentage change in VAS score 8 weeks after surgery to the preoperative value. Six months after surgery, there was a statistically significant

difference in the percentage reduction in VAS score compared to the preoperative value. The cystectomy group showed a considerably larger percentage drop. Pain (VAS) was much reduced in both groups after surgery compared to before, which is consistent with **Mohammed *et al.*[9]** where there was no discernible difference in the two groups when it came to the visual analogue scale (VAS) for pain before and after surgery[9]. Laparoscopic surgical excision of rectovaginal endometriosis was also evaluated for efficacy and safety by **Byrne *et al.*[10]** Six months following endometriosis laparoscopic excision, pain scores for premenstrual pain, menstrual pain, and non-cyclical pelvic pain were significantly lower than preoperative scores (from 7/10 to 3/10, 9/10 to 5/10, and 6/10 to 2/10 respectively).

Surgery and medicine often decreased VAS ratings and proportions of all kinds of pain over time. According to **Keukens *et al.*[11]** endometrioma patients experience less discomfort as a result of their condition when they have surgery or take medication. **Porpora *et al.*[12]** reported that out of 161 women surveyed, 97% reported no chronic pelvic discomfort, 3 reported mild pain, 1 reported moderate pain, and 1 reported severe pain.

At 8 weeks after surgery, no patients had recurrence, according to our findings. When comparing the groups tested for recurrence 6 months after surgery, no statistically significant difference was found. There was a recurrence of a 4 cm mass in one patient in the cystectomy group and two in the deroofing group. **Sweed*et al.*[8]** found that endometrioma recurrence was higher in the deroofing group (22/53, 41.5% vs. 11/54, 20.4%; p = 0.018), which contradicts our findings. Our research may have sparked criticism because of its modest sample size. In their study, **Shaltout *et al.*[13]** found that laparoscopic cystectomy has many advantages. For one, it lowers pelvic discomfort. Secondly, it raises the likelihood of spontaneous conception (14-54%). Lastly, it decreases recurrence rates (9.6 to 45% after one operation. Compared to drainage and ablation, laparoscopic cystectomy had better results in terms of endometrioma recurrence and subsequent clinical pregnancy rate [14]. Significant evidence of symptom relief and lower risk of recurrence compared to ablation has long favoured cystectomy as the preferred technique for total surgical excision [15]. Recurrence rates were significantly higher in the laser ablation group compared to the cystectomy group at 12 months of a randomised control trial [16], but this difference vanished at 60 months when neither group was taking hormone suppression medication.

LIMITATIONS

The study was conducted at a single centre with a small sample size, which might restrict the results' applicability to other settings. We didn't look at alternatives to surgery that don't diminish ovarian reserve.

CONCLUSION

Concerning OMA recurrence 6 months postoperatively, VAS pain level preoperatively or postoperatively, the cystectomy and deroofing techniques were comparable. Deroofing and ovarian cystectomy both reduced VAS pain scores at 8 weeks and 6 months postoperatively. Due to the decreased incidence of recurrence of OMA and endometriosis-associated pain, cystectomy has been regarded as the gold-standard surgical treatment.

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Conflict of Interest: Nil.

REFERENCES

1. **Smolarz B, Szyłło K, Romanowicz H (2021):** Endometriosis: Epidemiology, Classification, Pathogenesis. Int. J. Mol. Sci., 22(19):10554.
2. **Gałczyński K, Jóźwik M, Lewkowicz D *et al.* (2019):** Ovarian endometrioma in adolescent girls. J. Ovarian Res., 12(1):104.
3. **Şükür Y, Aslan B, Varlı B *et al.* (2024):** Ethanol sclerotherapy for endometriomas. J. Clin. Med., 13(24):7548.
4. **Exacoustos C, Romanini M, Rinaldo D *et al.* (2005):** Preoperative sonography of borderline ovarian tumors. Ultrasound Obstet. Gynecol., 25(1):50-59.
5. **Quintas-Marquès L, Valdés-Bango M, Box C *et al.* (2025):** Myofascial pelvic pain in endometriosis. J. Clin. Med., 14(10):3455.
6. **Ioannidou A, Machairiotis N, Stavros S *et al.* (2024):** Surgical interventions for endometrioma. Biomedicines, 12(12):2930.
7. **Daniilidis A, Grigoriadis G, Kalaitzopoulos D *et al.* (2023):** Surgical management of ovarian endometrioma. J. Clin. Med., 12(16):5324.
8. **Sweed M, Makled A, El-Sayed M *et al.* (2019):** Ovarian reserve after cystectomy vs deroofing. J. Minim. Invasive Gynecol., 26(5):877-882.
9. **Mohamed M, El-Noury M, Sakr B *et al.* (2023):** Impact of cystectomy vs deroofing on ovarian reserve. Benha J. Appl. Sci., 8(10):83-91.
10. **Byrne D, Curnow T, Smith P *et al.* (2018):** Laparoscopic excision of deep rectovaginal endometriosis. BMJ Open, 8(4):e018924.
11. **Keukens A, Veth V, Regis M *et al.* (2024):** Effect of surgery or medication on pain in endometrioma. Eur. J. Obstet. Gynecol. Reprod. Biol., 293:95-105.
12. **Porpora M, Pallante D, Ferro A *et al.* (2010):** Pain and recurrence after endometriosis treatment. Fertil. Steril., 93(3):716-721.
13. **Shaltout M, Elsheikhah A, Maged A *et al.* (2019):** New laparoscopic technique for ovarian endometriosis. J. Ovarian Res., 12(1):66.
14. **Muzii L, Di Tucci C, Di Feliciantonio M *et al.* (2017):** Management of endometriomas. Semin. Reprod. Med., 35(1):25-30.
15. **Baraki D, Richards E, Falcone T (2024):** Treatment of endometriomas. Best Pract. Res. Clin. Obstet. Gynaecol., 92:102449.
16. **Kitajima M, Defrère S, Dolmans M *et al.* (2011):** Endometriomas and reduced ovarian reserve. Fertil. Steril., 96(3):685-691.