DISCUSSION ON OPTIMAL TREATMENT STRATEGIES FOR OVARIAN ENDOMETRIOSIS

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Abstract. *Ovarian endometriosis is a prevalent gynecological condition associated with chronic pelvic pain, infertility, and decreased ovarian reserve. Despite its frequency, the optimal surgical approach remains controversial due to variability in diagnostic criteria and the potential risks associated with operative interventions. According to global estimates, endometriosis affects approximately 10–15% of women of reproductive age, with ovarian endometriomas observed in up to 44% of these cases. The burden of disease is particularly significant due to diagnostic delays, often averaging 7–10 years from symptom onset to confirmed diagnosis.*

Key words: *ovarian endometriosis, ovarian reserve, laparoscopy, fertility preservation, minimally invasive gynecology.*

INTRODUCTION. Disputes regarding the optimal method for treating ovarian endometriosis largely stem from the broad and, at times, imprecise application of the diagnosis. Often, the diagnosis is based solely on clinical symptoms such as lower abdominal pain or dysmenorrhea, even though these symptoms may be present in various other gynecological conditions. For instance, dysmenorrhea is an independent clinical entity and not necessarily indicative of endometriosis. This diagnostic oversimplification can lead to mismanagement and the performance of unnecessary interventions, complicating the treatment strategy for women affected by this condition.

Endometriomas negatively impact ovarian function. Numerous studies have documented a significant reduction in follicular density within endometriotic cysts — as low as 6.3 per mm^3, compared to 25.1 per mm^3 in healthy ovarian tissue [1,6,7]. Even unilateral lesions of moderate size can lead to a decrease in the number of antral follicles — one of the primary markers of ovarian reserve [3,4,6].

Over the past three years, external genital endometriosis (EGE) has consistently ranked as the leading indication for surgical intervention in women with infertility in the Andijan Valley.

Advanced forms of endometriosis requiring rectal mobilization and ureterolysis were performed in 5% of cases. Adnexectomy was indicated in 3% of women due to recurrent endometriomas, complete loss of healthy ovarian tissue, or age over 40 with completed reproductive plans. In 7% of cases, salpingectomy was carried out prior to planned IVF cycles due to tubal pathology.

Ovarian endometriosis is one of the most common manifestations of endometriosis and remains a significant clinical challenge due to its impact on female reproductive function [4,6]. It is frequently associated with chronic pelvic pain, menstrual irregularities, and infertility. Globally, endometriosis affects approximately 10–15% of women of reproductive age, and ovarian endometriomas are present in up to 44% of those affected. Despite the high prevalence, the disease is often diagnosed late — with delays averaging 7–10 years — due to its non-specific clinical presentation and overlap with other gynecological disorders.

The pathophysiological impact of ovarian endometriomas includes not only mechanical distortion of ovarian tissue but also biochemical changes that impair folliculogenesis and reduce ovarian reserve. Several studies have shown a significant decrease in follicular density and antral follicle count in ovaries affected by endometriotic cysts. These findings raise serious concerns regarding the timing and method of surgical intervention, especially in women desiring future fertility [7,9].

The choice of surgical strategy remains controversial. While cystectomy is considered the gold standard, it carries the risk of reducing ovarian reserve due to the inadvertent removal of healthy cortical tissue. Alternative techniques such as laser ablation, bipolar coagulation, or sclerotherapy are aimed at minimizing this risk but vary in effectiveness and recurrence rates [10,11]. There is currently no universally accepted algorithm for the optimal management of ovarian endometriomas in women of reproductive age.

Material and research methods. In this study, all 110 participants underwent surgical treatment — either operative laparoscopy or transvaginal sclerotherapy. Indications for surgery primarily included ovarian masses with sonographic features suggestive of endometriosis, pelvic floor obliteration, and persistent lesions observed for over three months. Additional factors such as chronic pelvic pain and infertility were considered but not regarded as primary indications, as these symptoms were variably associated with ovarian masses detected on clinical or sonographic examination.

Results. Based on the surgical techniques employed, patients were categorized into three groups:

Group 1 (n=37) included women with normal AMH levels and endometriomas 4–6 cm in diameter, often with adhesions involving adjacent organs as seen on preoperative ultrasound. A "cold" cystectomy technique was used, employing aquadissection and avoiding high-energy surgical tools (electrocautery or laser) to minimize thermal damage to the ovarian cortex and preserve ovarian reserve.

Group 2 (n=34) consisted of women with endometriomas smaller than 4 cm and normal AMH levels. These patients underwent ablation of the endometriotic lining using bipolar electrocautery.

Group 3 included patients with diminished ovarian reserve and recurrent

disease. All had ultrasound-confirmed involvement of adjacent organs in the adhesion process. Endometriomas in this group did not exceed 4 cm.

Complete cystectomy for endometriomas is associated with a significant risk of reducing ovarian reserve — a concern particularly in bilateral cases, where reproductive potential may be severely compromised. According to the World Health Organization, the reproductive age in women ranges from 18 to 35 years, highlighting the importance of preserving ovarian function in this demographic [6,12].

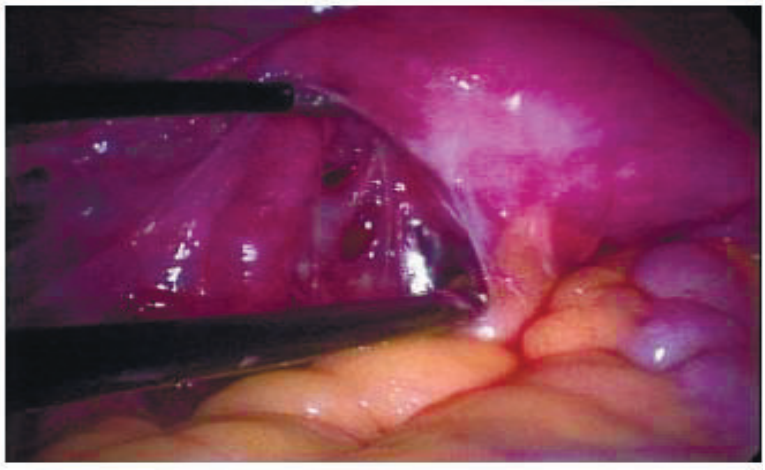

Fig. 1. Technique of "cold" cystectomy using aquadissection and avoidance of high-energy instruments to preserve ovarian tissue

Ovarian reserve depletion syndrome, described by Bugerenko K.A. et al. (2018) and Kochneva E.V. (2018), is characterized by critically low ovarian reserve. Even cystectomy, though aimed at removing endometriomas, can significantly reduce follicular count. A joint statement by the European

Society for Gynaecological Endoscopy, ESHRE, and the World Endometriosis Society outlines organ-preserving surgical strategies for endometriomas. These include:

- Cystectomy without the use of high-energy tools
- Laser or plasma excision of the endometriotic capsule
- Bipolar electrocautery for hemostasis

Regarding electrosurgical techniques, it is recommended to use bipolar energy not exceeding 40 watts. Monopolar energy is reserved for rare indications, such as fibrotic endometriotic tissue at the ovarian hilum, with a recommended power limit of 20 watts (Saridogan E. et al., 2017). Research by Davydov A.I. highlights the potential for deep tissue damage that may not be visible laparoscopically, underscoring the importance of technique selection [3].

An alternative viewpoint has been presented by researchers including M. Candiani (2018), M. Vignali (2015), and F. Zhao (2020), who question the widespread use of electrocautery. Davydov A.I. and colleagues (2012, 2013) argue that even "cold" cystectomy may not fully preserve ovarian reserve. Their main concern is the significant decline in ovarian reserve post-cystectomy, which can reduce the success of assisted reproductive technologies. However, later ESHRE guidelines omitted this principle, possibly due to concerns about the risk of endometriosis-associated ovarian cancer [6].

In Group 2, the ablation of the endometrioma was performed using bipolar electrocautery. After partial excision, the cyst wall was everted so the ovary resembled a mushroom cap, exposing the endometriotic lining. This surface was ablated with a bipolar clamp (36–38 W), after which the ovary spontaneously returned to its normal shape.

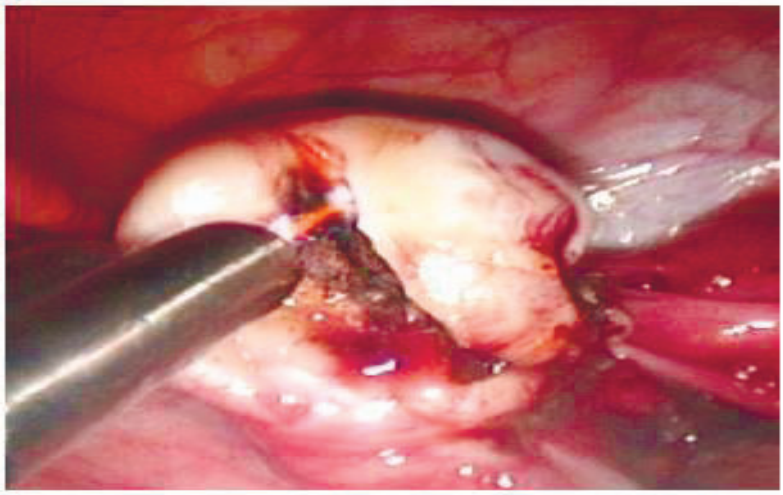

Fig. 2. Ablation of ovarian endometrioma using bipolar electrocautery.

In our clinical observations, the third group underwent aspiration-sclerotherapy intraoperatively during laparoscopy. Simultaneous pelvic revision and adhesiolysis enabled comprehensive treatment of both endometriotic cysts and pelvic adhesions. This combined approach proved highly effective with minimal risk of complications and recurrence.

Following puncture, the cyst contents — typically thick and viscous — were aspirated after preliminary liquefaction. The first portion was sent for cytology. The cavity was then irrigated with 0.9% sodium chloride solution. Finally, 96% ethanol was instilled into the cavity for 10 minutes, then completely evacuated.

CONCLUSION

The results of this study demonstrate that the choice of surgical treatment for ovarian endometriosis must be carefully individualized, taking into account the patient's age, ovarian reserve status, size and localization of endometriomas, presence of recurrence, and the extent of pelvic adhesions.

Organ-preserving techniques such as “cold” cystectomy with aquadissection have shown clear advantages in minimizing thermal injury to the ovarian cortex and preserving ovarian reserve in women of reproductive age. Ablation of the endometriotic lining using bipolar electrocautery under controlled power settings can also serve as a viable alternative for small-sized endometriomas. In cases of recurrent disease with diminished ovarian reserve, intraoperative aspiration-sclerotherapy has proven to be a promising method, offering both efficacy and low invasiveness.

These findings underscore the importance of a comprehensive approach to the management of ovarian endometriosis, which should include thorough clinical and imaging assessments, the use of fertility-preserving surgical technologies, and continuous monitoring of ovarian reserve. Special attention must be given to young women who have not yet fulfilled their reproductive potential, for whom fertility preservation remains a top priority.

Therefore, the optimization of surgical strategies in ovarian endometriosis should be guided by principles of individualization, minimally invasive intervention, and multidisciplinary care [1,2,7]. This will improve treatment efficacy and reproductive outcomes in this patient population.

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