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RESEARCH ARTICLE

COMPARATIVE EVALUATION OF OVARIAN RESERVE AFTER LAPAROSCOPIC SURGERY FOR ENDOMETRIOTIC AND NON-ENDOMETRIOTIC OVARIAN CYSTS

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Abstract

Laparoscopic surgery is widely used for the management of benign ovarian masses because of its minimally invasive nature and favorable postoperative recovery; however, concerns remain regarding its potential impact on ovarian reserve, particularly in women with endometriotic cysts. This prospective observational study, conducted in the Department of Obstetrics and Gynaecology at SMS Medical College, Jaipur, between March 2023 and January 2024, evaluated changes in ovarian reserve following laparoscopic management of benign ovarian masses using serum anti-Müllerian hormone (AMH) levels. Thirty women aged 18–38 years undergoing laparoscopic cystectomy were included. Serum AMH levels were measured preoperatively, on postoperative day 7, and postoperative day 30, while follicle-stimulating hormone (FSH) and luteinizing hormone (LH) levels were assessed preoperatively and on postoperative day 2. The mean age of participants was 26.43 ± 4.48 years. Endometriotic cysts were the most common pathology (n=10), followed by dermoid cysts (n=5), hemorrhagic cysts (n=4), follicular cysts (n=3), mucinous cystadenomas (n=3), and serous cystadenomas (n=2). No statistically significant decline in AMH levels was observed on postoperative day 7 across cyst types. However, patients with endometriotic cysts demonstrated a significant reduction in AMH levels from 2.53 ± 1.35 ng/mL preoperatively to 1.48 ± 0.62 ng/mL on postoperative day 30 ($p=0.038$), representing a 41.5% decline, whereas no significant postoperative AMH decline was observed in non-endometriotic cysts. FSH and LH levels did not show consistent significant postoperative changes. These findings suggest that laparoscopic management of benign ovarian masses generally preserves ovarian reserve in non-endometriotic cysts, while endometriotic cysts are associated with a significant short-term decline in serum AMH levels, emphasizing the need for cyst type-specific preoperative counseling and fertility-preserving surgical techniques in reproductive-age women undergoing laparoscopic surgery for endometriomas.

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Introduction:-

Laparoscopic surgery is widely accepted for the management of benign ovarian masses, offering reduced morbidity, shorter hospital stays, and faster recovery compared to laparotomy. However, growing evidence suggests that ovarian surgery may compromise ovarian reserve, raising concerns regarding future fertility outcomes, particularly in reproductive-age women undergoing ovarian cystectomy [1].Anti-Müllerian hormone (AMH) has emerged as one of the most reliable biomarkers for assessing ovarian reserve because it is secreted by granulosa cells of preantral and small antral follicles and remains relatively stable throughout the menstrual cycle [2]. Unlike follicle-stimulating hormone (FSH), AMH directly reflects the remaining follicular pool and has been increasingly used to evaluate ovarian function after surgical intervention [3].

Several studies have demonstrated a significant decline in AMH levels following laparoscopic ovarian cystectomy. Chang et al. reported serial postoperative reductions in serum AMH after laparoscopic cystectomy, suggesting a detrimental effect on ovarian reserve [1]. Similarly, Salihoğlu et al. observed a short-term decline in ovarian reserve markers in both endometriotic and non-endometriotic cysts following laparoscopic surgery [4]. Anh et al. also demonstrated significant postoperative AMH reduction after laparoscopic excision of endometriomas [5]. Ata et al. reported that the choice of hemostatic technique during laparoscopic endometrioma excision significantly influences postoperative ovarian reserve, with bipolar coagulation associated with greater decline in ovarian reserve compared to suturing or hemostatic sealants [6].Recent systematic reviews and meta-analyses have strengthened this evidence. Raffi et al. and Somigliana et al. demonstrated that laparoscopic endometrioma excision is consistently associated with significant postoperative decline in ovarian reserve [7,8]. Moreno-Sepulveda et al. further confirmed substantial reductions in AMH levels following laparoscopic endometrioma surgery [9]. Likewise, Pais et al. and Cabiscuelas et al. reported persistent postoperative decline in ovarian reserve, particularly among women with endometriotic cysts [10,11].

The mechanisms responsible for postoperative ovarian reserve reduction are believed to be multifactorial. Inadvertent removal of healthy ovarian cortex during cyst stripping may lead to follicular loss [12,13]. Additionally, bipolar electrocoagulation used for hemostasis can compromise ovarian vascularity and contribute to thermal damage [14,15]. Kitajima et al. further suggested that endometriosis itself may adversely affect ovarian reserve through chronic inflammatory changes and fibrosis [16].Despite these findings, most available literature primarily focuses on endometriotic cysts, and limited comparative data exist regarding the impact of different benign ovarian cyst types on ovarian reserve. Understanding whether various cyst histologies have differential effects on postoperative ovarian reserve is essential for optimizing surgical planning and improving preoperative fertility counseling.Therefore, this study aimed to compare changes in AMH levels following laparoscopic management of different benign ovarian masses and evaluate whether endometriotic cysts result in greater ovarian reserve compromise than other benign ovarian pathologies.

Materials & Methods:-

Study **design and setting**

This prospective observational study was conducted at the Department of Obstetrics and Gynaecology, SMS Medical College, Jaipur, from March 2023 to January 2024. The study was approved by the Institutional Ethics Committee, SMS Medical College and Attached Hospitals, Jaipur. Ethical approval was granted vide letter number 545/MC/EC/2023 dated 26/04/2023. The study adhered to the principles of the Declaration of Helsinki, and written informed consent was obtained from all participants.

Participants

Women aged 18-38 years with benign ovarian masses requiring laparoscopic surgery were recruited from the gynecology outpatient department.Inclusion criteria included women diagnosed with benign ovarian masses including ovarian cysts, endometriotic cysts, para ovarian cysts, and dermoid cysts who provided informed consent.
Exclusion criteria included polycystic ovarian syndrome, malignant ovarian masses, previous ovarian surgery, ovarian ectopic pregnancy, and infective ovarian pathology such as tuberculosis or pyogenic infections.

Surgical procedure

All laparoscopic procedures were performed by experienced gynecologic surgeons using a standardized three-port technique. After induction of general anesthesia and bladder catheterization, pneumoperitoneum was established using a Veress needle through the umbilical port. Cyst enucleation was performed using sharp and blunt dissection, and hemostasis was achieved with bipolar electrocoagulation.

Ovarian tissue preservation was prioritized during cyst stripping because inadvertent excision of normal ovarian cortex has been reported during laparoscopic cystectomy [13]. As excessive use of bipolar coagulation has been associated with reduced ovarian reserve, minimal energy application was emphasized during surgery [14,15]. Tissue specimens were retrieved using endobags and sent for histopathological examination.

Outcome measures

The primary outcome was the change in serum anti-Müllerian hormone (AMH) levels from baseline to postoperative day 30. Secondary outcomes included AMH levels on postoperative day 7 and postoperative changes in follicle-stimulating hormone (FSH) and luteinizing hormone (LH) levels. AMH was selected as the primary biomarker because it is considered a sensitive and reliable indicator of ovarian reserve and has been widely used in previous studies evaluating ovarian function after laparoscopic ovarian surgery [1,4].

Laboratory analysis

Venous blood samples (5 mL) were collected preoperatively, on postoperative day 7, and postoperative day 30 for AMH measurement. Additional samples for FSH and LH estimation were collected preoperatively during the early follicular phase and postoperatively on day 2 of the subsequent menstrual cycle. Samples were processed within two hours and analyzed using standardized automated immunoassays. AMH levels were reported in ng/mL, while FSH and LH levels were reported in mIU/mL.

Sample size and statistical analysis

The sample size was calculated to detect a minimum expected difference of 0.9 ng/mL in serum AMH levels between preoperative and postoperative measurements with 80% study power and a 95% confidence level. Based on effect sizes observed in previously published studies evaluating postoperative AMH decline following laparoscopic ovarian cystectomy, a minimum sample size of 30 patients was considered adequate for the present study [1,12].

Descriptive statistics were used to summarize baseline characteristics of the study population. Continuous variables were expressed as mean ± standard deviation (SD), while categorical variables were presented as frequencies and percentages. Normality of data distribution was assessed using the Shapiro-Wilk test. Comparisons between preoperative and postoperative hormonal parameters were performed using the paired sample t-test. A p-value of <0.05 was considered statistically significant. Statistical analysis was performed using IBM SPSS Statistics version 25.0.

Results:-

A total of 30 women with benign ovarian masses who underwent laparoscopic cystectomy were included in the study. The mean age of participants was 26.43 ± 4.48 years (range: 18-38 years), with most patients belonging to the 18-27-year age group (63.3%) (Table *1*).

Table 1: Age group distribution of the study subjects

Age group	Frequency	Percentage
18 - 27	19	63.3%
28 - 38	11	36.7%
Total	30	100.0%

Clinical presentation

The most common presenting symptoms were infertility (96.7%, n=29), irregular menses (73.3%, n=22), and abdominal pain (66.7%, n=20). Among infertile patients, 50.0% had primary infertility, 46.7% had secondary infertility, and 3.3% had no infertility issues (Table *2*).

Table 2: Distribution of study subjects according to symptomatology

Symptom	Frequency	Percentage
Irregular menses	22	73.3%
Pain abdomen	20	66.6%
Infertility	29	96.7%

Cyst characteristics and distribution

Cyst Location: The right ovary was most commonly affected (70.0%, n=21), followed by bilateral involvement (16.7%, n=5) and left ovary (13.3%, n=4).

Histopathological Types (Table 3): Endometriotic cysts were the most common (33.3%, n=10), followed by dermoid cysts (16.7%, n=5), hemorrhagic cysts (13.3%, n=4), follicular cysts (10.0%, n=3), mucinous cystadenomas (10.0%, n=3), serous cystadenomas (6.7%, n=2), and mixed bilateral cysts (10.0%, n=3).

Table 3: Distribution of study subjects according to type of Ovarian Cyst

Types of Cysts	Frequency	Percentage
Dermoid	5	16.7%
Endometriotic cyst	10	33.3%
Follicular cyst	3	10.0%
Hemorrhagic cyst	4	13.3%
Mucinous cystadenoma	3	10.0%
R-follicular cyst, L-hemorrhagic cyst	1	3.3%
R-hemorrhagic cyst, L-simple ovarian cyst	1	3.3%
R-hemorrhagic cyst, L-follicular cyst	1	3.3%
Serous cystadenoma	2	6.7%
Total	30	100.0%

R-Right
L-Left
Mixed bilateral cysts containing follicular or hemorrhagic pathology were grouped with corresponding cyst categories for hormonal analysis.

Baseline AMH levels

The majority of patients (66.7%, n=20) had baseline AMH levels between 2.01-4.00 ng/ml, while 26.7% (n=8) had levels ≤2.00 ng/ml. Only 6.6% had AMH levels >4.00 ng/ml. A significant correlation was found between infertility status and preoperative AMH levels ($p < 0.001$), with both primary and secondary infertility patients having significantly lower baseline AMH levels.

Surgical outcomes

All procedures were completed laparoscopically without conversion to open surgery using standardized three-port technique. Ovarian cyst enucleation was performed by the same surgeon using minimal or no energy source to preserve ovarian tissue. No major intraoperative complications occurred, and all patients were discharged within 24 hours postoperatively.

AMH changes over time

Postoperative Day 7 Analysis (Table 4): No cyst type showed statistically significant AMH decline at day 7 post-surgery. Mean changes included: dermoid cysts (3.81±3.66 to 3.24±3.09 ng/mL, p = 0.80), endometriotic cysts (2.53±1.35 to 2.45±0.96 ng/mL, p=0.88), follicular cysts (2.23±0.72 to 2.05±0.88 ng/mL, p=0.76), hemorrhagic cysts (2.41±0.66 to 2.30±0.64 ng/mL, p=0.77), mucinous cystadenomas (1.95±0.73 to 1.89±0.25 ng/mL, p=0.71), and serous cystadenomas (2.76±0.93 to 2.46±0.66 ng/mL, p=0.745).

Table 4: Comparison of mean preoperative and postoperative day 7 AMH levels by ovarian cyst type

Types of ovarian cysts	Count	Preoperative AMH	Postoperative Day 7 AMH	t-score	p-value	Significance
		Mean ± Standard Deviation	Mean ± Standard Deviation			
Dermoid	5	3.81 ± 3.66	3.24 ± 3.09	0.27	0.80	NS
Endometriotic cyst	10	2.53 ± 1.35	2.45 ± 0.96	0.16	0.88	NS
Follicular cyst	4	2.23 ± 0.72	2.05 ± 0.88	0.34	0.76	NS
Hemorrhagic cyst	6	2.41 ± 0.66	2.30 ± 0.64	0.31	0.77	NS
Mucinous cystadenoma	3	1.95 ± 0.73	1.89 ± 0.25	0.43	0.71	NS
Serous cystadenoma	2	2.76 ± 0.93	2.46 ± 0.66	0.42	0.75	NS

Values are expressed as Mean ± Standard Deviation (SD). Statistical analysis was performed using the paired sample t-test.
AMH- Anti-Müllerian hormone
S = Significant
NS = Non-Significant

Postoperative Day 30 Analysis (Table 5): Only endometriotic cysts demonstrated a statistically significant AMH decline from 2.53±1.35 ng/mL preoperatively to 1.48±0.62 ng/mL at day 30 (p=0.038), representing a 41.5% reduction. Other cyst types showed no significant changes: dermoid cysts (3.81±3.66 to 3.16±2.39 ng/mL, p=0.748), follicular cysts (2.23±0.72 to 1.92±0.80 ng/mL, p=0.585), hemorrhagic cysts (2.41±0.66 to 2.05±0.54 ng/mL, p=0.325), mucinous cystadenomas (1.95±0.73 to 1.85±0.11 ng/mL, p=0.826), and serous cystadenomas (2.76±0.93 to 2.59±0.81 ng/mL, p=0.863).

Table 5: Comparison of mean preoperative and postoperative day 30 AMH levels by ovarian cyst type

Types of ovarian cysts	Count	Preoperative AMH	Postoperative Day 30 AMH	t-score	p-value	Significance
		Mean ± Standard Deviation	Mean ± Standard Deviation			
Dermoid	5	3.81 ± 3.66	3.16 ± 2.39	0.34	0.75	NS
Endometriotic cyst	10	2.53 ± 1.35	1.48 ± 0.62	2.43	0.04	S
Follicular cyst	4	2.23 ± 0.72	1.92 ± 0.80	0.61	0.59	NS
Hemorrhagic cyst	6	2.41 ± 0.66	2.05 ± 0.54	1.09	0.33	NS
Mucinous cystadenoma	3	1.95 ± 0.73	1.85 ± 0.11	0.25	0.83	NS
Serous cystadenoma	2	2.76 ± 0.93	2.59 ± 0.81	0.22	0.86	NS

Values are expressed as Mean ± Standard Deviation (SD). Statistical analysis was performed using the paired sample t-test.
AMH- Anti-Müllerian hormone
S = Significant
NS = Non-Significant

FSH and LH changes

FSH Analysis (Table 6): Only mucinous cystadenomas showed significant FSH decrease from 8.12±1.61 mIU/mL preoperatively to 4.15±0.91 mIU/mL postoperatively (p=0.02). Other cyst types showed no significant FSH changes: dermoid cysts (8.51±1.72 to 6.49±1.99 mIU/mL, p=0.124), endometriotic cysts (8.94±0.88 to 7.95±1.63 mIU/mL, p=0.108), follicular cysts (8.77±0.22 to 6.00±2.82 mIU/mL, p=0.097), hemorrhagic cysts (8.56±0.94 to 6.52±2.74 mIU/mL, p=0.115), and serous cystadenomas (7.73±0.57 to 5.13±0.92 mIU/mL, p=0.076).

Table 6: Comparison of preoperative and postoperative day 2 FSH levels by cyst type

Types of ovarian cysts	Count	Preoperative FSH	Postoperative Day 2 FSH	t-score	P-value	Significance
		Mean ± Standard Deviation	Mean ± Standard Deviation			
Dermoid	5	8.51 ± 1.72	6.49 ± 1.99	1.94	0.12	NS
Endometriotic cyst	10	8.94 ± 0.88	7.95 ± 1.63	1.785	0.11	NS
Follicular cyst	4	8.77 ± 0.22	6.00 ± 2.82	2.39	0.10	NS
Hemorrhagic cyst	6	8.56 ± 0.94	6.52 ± 2.74	1.91	0.12	NS
Mucinous cystadenoma	3	8.12 ± 1.61	4.15 ± 0.91	6.97	0.02	S
Serous cystadenoma	2	7.73 ± 0.57	5.13 ± 0.92	8.34	0.08	NS

Values are expressed as Mean ± Standard Deviation (SD). Statistical analysis was performed using the paired sample t-test.
FSH- Follicle-Stimulating Hormone
S = Significant
NS = Non-Significant

LH Analysis (Table 7): No cyst type demonstrated statistically significant changes in LH levels postoperatively. Changes included: dermoid cysts (6.19±1.89 to 7.55±4.15 mIU/mL, p=0.523), endometriotic cysts (6.66±2.63 to 7.15±3.14 mIU/mL, p=0.709), follicular cysts (8.71±2.85 to 7.90±2.77 mIU/mL, p=0.697), hemorrhagic cysts

(9.03±2.30 to 6.07±2.72 mIU/mL, p=0.207), mucinous cystadenomas (6.95±1.46 to 5.99±4.66 mIU/mL, p=0.75), and serous cystadenomas (4.50±2.04 to 4.09±1.02 mIU/mL, p=0.823).

Table 7: Comparison of preoperative and postoperative day 2 LH levels by ovarian cyst type

Types of ovarian cysts	Count	Preoperative LH	Postoperative Day 2 LH	t-score	p-value	Significance
		Mean ± Standard Deviation	Mean ± Standard Deviation			
Dermoid	5	6.19 ± 1.89	7.55 ± 4.15	0.70	0.52	NS
Endometriotic cyst	10	6.66 ± 2.63	7.15 ± 3.14	0.39	0.71	NS
Follicular cyst	4	8.71 ± 2.85	7.90 ± 2.77	0.43	0.70	NS
Hemorrhagic cyst	6	9.03 ± 2.30	6.07 ± 2.72	1.45	0.21	NS
Mucinous cystadenoma	3	6.95 ± 1.46	5.99 ± 4.66	0.37	0.75	NS
Serous cystadenoma	2	4.50 ± 2.04	4.09 ± 1.02	0.29	0.82	NS

Values are expressed as Mean ± Standard Deviation (SD). Statistical analysis was performed using the paired sample t-test.
LH- Luteinizing Hormone
S = Significant
NS = Non-Significant
Women undergoing laparoscopic surgery for endometriotic cysts experienced a significant short-term decline in ovarian reserve, whereas patients with non-endometriotic benign ovarian cysts did not demonstrate statistically significant ovarian reserve reduction.

Discussion:-

The present prospective observational study evaluated the short-term effect of laparoscopic management of benign ovarian masses on ovarian reserve using serum anti-Müllerian hormone (AMH) as the primary marker. The principal finding of this study was that patients with endometriotic cysts demonstrated a statistically significant decline in AMH levels at postoperative day 30, whereas non-endometriotic cysts showed no significant reduction in ovarian reserve markers.In the present study, patients with endometriotic cysts demonstrated a 41.5% decline in serum AMH levels at postoperative day 30. Similar findings have been consistently reported in previous literature. Chang et al. reported significant serial declines in serum AMH following laparoscopic ovarian cystectomy, particularly among women with endometriomas [1]. Celik et al. also demonstrated progressive postoperative AMH decline after laparoscopic stripping of endometriomas, with reductions persisting up to six months postoperatively [12].

These results are consistent with previous systematic reviews and meta-analyses. Raffi et al. and Somigliana et al. demonstrated that laparoscopic endometrioma excision is consistently associated with significant reduction in ovarian reserve [7,8]. Moreno-Sepulveda et al. reported postoperative AMH reductions following laparoscopic endometrioma surgery [9].Postoperative reduction in ovarian reserve is likely multifactorial. Muzii et al. demonstrated histological evidence of normal ovarian tissue removal during laparoscopic cystectomy, suggesting that the stripping technique may not always preserve healthy ovarian follicles [13]. Deckers et al. and Li et al. reported that extensive use of bipolar cauterization significantly affects ovarian reserve after cystectomy [14,15].

Endometriosis-associated inflammatory changes may additionally explain the greater postoperative ovarian reserve decline observed in endometriotic cysts. Chronic inflammation, oxidative stress, fibrosis, and altered ovarian vascularization associated with endometriosis may independently impair ovarian reserve even before surgery [16]. Iwase et al. and Kwon et al. also reported greater AMH decline in endometriotic cysts compared with other benign ovarian masses following laparoscopic cystectomy [17,18].

In contrast, patients with non-endometriotic cysts did not demonstrate statistically significant postoperative AMH decline. Similar observations were reported by Jang et al., who found significant postoperative AMH reduction predominantly in women with endometriotic cysts, whereas non-endometriotic cysts showed minimal ovarian reserve impairment [19]. Kuroda et al. also reported significantly lower baseline AMH levels in women with endometriomas compared with other benign ovarian cysts [20]. Younis and Taylor further emphasized that both the presence of endometrioma itself and surgical excision contribute to diminished ovarian reserve [21]. Cabiscuelas et al. similarly observed that postoperative AMH decline was greater in endometriotic cysts than in non-endometriotic ovarian cysts after laparoscopic cyst enucleation [11].

The present study also demonstrated that AMH is a more sensitive marker of ovarian reserve than gonadotropins such as FSH and LH. Similar findings have been reported by Chang et al., Iwase et al. and Jang et al. [1,17,19]. Interestingly, no significant decline in AMH was observed on postoperative day 7 in most patients, whereas significant reductions became more apparent by postoperative day 30. Similar delayed postoperative AMH reduction patterns have been reported in previous studies evaluating serial AMH measurements after laparoscopic cystectomy [1,12].

The strengths of the present study include its prospective design, standardized laparoscopic surgical technique, and serial hormonal assessment. All surgeries were performed by experienced surgeons using fertility-preserving principles and minimal electrocautery, thereby reducing operator-related variability. Additionally, the study compared multiple histopathological subtypes of benign ovarian masses rather than focusing exclusively on endometriomas.However, certain limitations should be acknowledged. The relatively small sample size and short follow-up duration may limit the generalizability of findings and preclude assessment of long-term ovarian reserve recovery. Furthermore, ovarian reserve assessment relied primarily on serum AMH levels without incorporation of antral follicle count or ovarian stromal blood flow assessment. Long-term fertility outcomes and spontaneous pregnancy rates were also not evaluated.Overall, the findings of the present study reinforce existing evidence that laparoscopic management of endometriotic cysts is associated with significant short-term decline in ovarian reserve, whereas non endometriotic cysts demonstrate comparatively minimal impact. These findings highlight the importance of individualized fertility counseling, careful patient selection, and adoption of ovarian tissue-preserving surgical techniques in reproductive-age women undergoing laparoscopic ovarian surgery.

Conclusions:-

Laparoscopic management of benign ovarian masses appeared to preserve ovarian reserve in most non-endometriotic cysts. However, patients with endometriotic cysts demonstrated a significant short-term decline in serum AMH levels following surgery, suggesting greater vulnerability of ovarian reserve in this subgroup.
These findings emphasize the importance of cyst type-specific preoperative counseling and fertility-preserving surgical techniques, particularly in reproductive-age women undergoing laparoscopic cystectomy for endometriomas. Larger studies with longer follow-up are required to evaluate long-term ovarian reserve recovery after surgery.

References:-

1. Chang HJ, Han SH, Lee JR, et al.: Impact of laparoscopic cystectomy on ovarian reserve: serial changes of serum anti-Müllerian hormone levels. Fertil Steril. 2010, 94:343-9. 10.1016/j.fertnstert.2009.02.022
2. Chen Y., Pei H., Chang Y., et al.: The impact of endometrioma and laparoscopic cystectomy on ovarian reserve and the exploration of related factors assessed by serum anti-Mullerian hormone: a prospective cohort study. J Ovarian Res 7. 2014, 108. 10.1186/s13048-014-0108-0
3. Vignali, M. Mabrouk, M. Ciocca, et al.: Surgical excision of ovarian endometriomas: Does it truly impair ovarian reserve?. J. Obstet. Gynaecol Res. 2015, 41:1773-1778. 10.1111/jog.12830
4. Salihoğlu KN, Dilbaz B, Cırık DA, et al.: Short-Term Impact of Laparoscopic Cystectomy on Ovarian Reserve Tests in Bilateral and Unilateral Endometriotic and Nonendometriotic Cysts. J Minim Invasive Gynecol. 2016, 23:719-25. 10.1016/j.jmig.2016.02.018
5. Anh ND, Ha NTT, Tri NM, et al.: Long-Term Follow-Up Of Anti-Mullerian Hormone Levels After Laparoscopic Endometrioma Cystectomy. Int J Med Sci. 2022, 19:651-658. 10.7150/ijms.69830
6. Ata B, Turkgeldi E, Seyhan A, et al.: Effect of hemostatic method on ovarian reserve following laparoscopic endometrioma excision; comparison of suture, hemostatic sealant and bipolar dessication; a systematic review and meta-analysis. J Minim Invasive Gynecol. 2015, 10.1016/J.JMIG.2014.12.168
7. Francesca Raffi, Mostafa Metwally, Saad Amer: The impact of excision of ovarian endometrioma on ovarian reserve: a systematic review and meta-analysis. J Clin Endocrinol Metab. 2012, 3146-3154. 10.1210/jc.2012-1558
8. Somigliana E, Berlanda N, Benaglia L, et al.: Surgical excision of endometriomas and ovarian reserve: a systematic review on serum anti-Müllerian hormone level modifications. Fertil Steril. 2012, 98:1531-8. 10.1016/j.fertnstert.2012.08.009

9. Moreno-Sepulveda J, Romeral C, Niño G, et al.: The effect of laparoscopic endometrioma surgery on anti-Müllerian hormone: a systematic review of the literature and meta-analysis. JBRA Assist Reprod. 2022, 26:88-104. 10.5935/1518-0557.20210060
10. Pais AS, Reis JN, Laganà AS, et al.: Impact of surgical management of endometrioma on AMH levels and pregnancy rates: a review of recent literature. J Clin Med. 2021, 10:414. 10.3390/jcm10030414
11. Cabiscuelas CA, Li LY, Seon KE, et al.: Comparison of serum anti-Müllerian hormone-level changes in single-port laparoscopic endometriotic and non-endometriotic ovarian cyst enucleations. J Menopausal Med. 2021, 27:168-74. 10.6118/jmm.21031
12. Celik H, Dogan E, Okyay, et al.: Effect of laparoscopic excision of endometriomas on ovarian reserve: serial changes in the serum antimüllerian hormone levels. Fertil Steril. 2012, 97:1472-1478. 10.1016/j.fertnstert.2012.03.027
13. Muzii L, Bianchi A, Crocè C, et al.: Laparoscopic excision of ovarian cysts: is the stripping technique a tissue-sparing procedure?. Fertil Steril. 2002, 77:609-14. 10.1016/S0015-0282(01)03203-4
14. Deckers P, Ribeiro SC, Simões RDS, et al.: Systematic review and meta-analysis of the effect of bipolar electrocoagulation during laparoscopic ovarian endometrioma stripping on ovarian reserve. Int J Gynaecol Obstet. 2018, 140:11-17. 10.1002/ijgo.12338
15. Li CZ, Liu B, Wen ZQ, et al.: The impact of electrocoagulation on ovarian reserve after laparoscopic excision of ovarian cysts: a prospective clinical study of 191 patients. Fertil Steril. 2009, 92:1428-35. 10.1016/j.fertnstert.2008.08.071
16. Kitajima M, Defrère S, Dolmans MM, et al.: Endometriomas as a possible cause of reduced ovarian reserve in women with endometriosis. Fertil Steril. 2011, 96:685-91. 10.1016/j.fertnstert.2011.06.064
17. Iwase A, Hirokawa W, Goto M, et al.: Serum anti-Müllerian hormone level is a useful marker for evaluating the impact of laparoscopic cystectomy on ovarian reserve. Fertil Steril. 2010, 94:2846-9. 10.1016/j.fertnstert.2010.06.010
18. Kwon SK, Kim SH, Yun SC, et al.: Decline of serum anti-Müllerian hormone levels after laparoscopic ovarian cystectomy in endometrioma and other benign cysts: a prospective cohort study. Fertil Steril. 2014, 101:435-41. 10.1016/j.fertnstert.2013.10.043
19. Jang WK, Lim SY, Park JC, et al.: Surgical impact on serum anti-Müllerian hormone in women with benign ovarian cyst: a prospective study. ObstetGynecol Sci. 2014, 57:121-7. 10.5468/ogs.2014.57.2.121
20. Kuroda M., Kuroda K., Arakawa A., et al.: Impact of ovarian endometrioma cystectomy on ovarian reserve parameters. J ObstetGynaecol Res. 2012, 38:1187-1193. 10.1111/j.1447-0756.2012.01845.x
21. Younis JS and Taylor HS: The impact of ovarian endometrioma and endometriotic cystectomy on anti-Müllerian hormone, and antral follicle count: a contemporary critical appraisal of systematic reviews. Front. Endocrinol. 2024, 15:1397279. 10.3389/fendo.2024.1397279