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Retrospective Study

Efficacy and safety of minimally invasive laparoscopic surgery under general anesthesia for ovarian cancer

INTRODUCTION

Ovarian cancer is one of the malignant tumors of the female reproductive system. It is mainly characterized by lower abdominal masses and abdominal effusion as clinical manifestations. According to reports, the mortality rate of ovarian cancer ranks first among gynecological malignancies. Most cases originate from the ovarian epithelium and during the course of the disease, local infiltration and distant metastasis are common[1]. Ovarian cancer accounts for 2.5% of female malignancies, and the 5-year survival rate for early-stage ovarian cancer is as high as 93%. However, early-stage ovarian cancer usually presents no characteristic symptoms, making diagnosis relatively difficult. Approximately 70% of ovarian cancer patients are diagnosed in the late stage, resulting in a poor prognosis with a 5-year survival rate of less than 30%[2-4]. Therefore, early and accurate diagnosis as well as standardized treatment can better improve the prognosis of ovarian cancer patients[5]. Currently, surgery remains the main treatment for early-stage ovarian cancer. However, traditional surgical procedures, primarily open surgeries, have many drawbacks including large trauma and slow patient recovery. With the continuous development of laparoscopic techniques, their application in the treatment of early-stage ovarian cancer has become more widespread[6,7].

Compared to the issues of large incision and slow recovery associated with open surgery, laparoscopic techniques have the following advantages: smaller trauma[8], simultaneous diagnosis and treatment, faster recovery[9], shorter hospitalization time[10],

better abdominal cosmetic effect, and easy preservation of imaging data. In the diagnosis and treatment of ovarian cancer, laparoscopic techniques can complement open surgeries. In clinical practice, laparoscopic exploration is performed for suspected pelvic masses, and if intraoperative frozen pathology confirms ovarian cancer, the procedure can be converted to open surgery for comprehensive staging, thus avoiding the need for a second surgery[11,12]. For patients with advanced ovarian cancer, laparoscopic exploration can be performed. If evaluated as suitable for primary tumor debulking, the procedure can be directly converted to open surgery for tumor debulking[13,14].

Therefore, this study focuses on early-stage ovarian cancer patients and evaluates the application value of open surgery and minimally invasive laparoscopic surgery under general anesthesia in this population, aiming to provide clinical reference for the optimal selection of surgical approaches in the treatment of early-stage ovarian cancer.

MATERIALS AND METHODS

General information

A retrospective analysis was conducted on the clinical data of 90 early-stage ovarian cancer patients admitted to our department from January 2022 to January 2023. According to different surgical treatment methods, the patients were divided into a study group and a control group, with 45 cases in each group. The study group underwent laparoscopic ovarian cancer surgery, while the control group underwent open abdominal ovarian cancer surgery. Pathological examination was performed on all tumors, including all histological types of ovarian cancer. After comprehensive staging, epithelial ovarian cancer was defined as stage I or II disease according to the International Federation of Gynecology and Obstetrics (FIGO) classification, excluding patients with stage III or IV disease.

Inclusion criteria

Inclusion criteria: (1) Confirmed diagnosis of ovarian cancer through imaging and cytology examination; (2) Diagnosed with early-stage ovarian cancer according to the FIGO criteria; (3) Suitable for surgical intervention; and (4) No tumor metastasis.

Exclusion criteria: (1) Presence of other tumors; (2) Organ failure; (3) Inability to tolerate surgery; or (4) Allergy to anesthesia drugs.

Data collection

Retrospective review of electronic medical records of all included patients was conducted to collect demographic and clinical characteristics, preoperative assessment, surgical description (duration, amount of bleeding, tumor rupture, and intraoperative complications), postoperative complications and their occurrence time, tolerance to oral intake and activity, and length of hospital stay.

Study methods

Study group: Study group (Laparoscopy group) performed laparoscopic lymph node dissection for treatment. The patient received general anesthesia and was placed in the lithotomy position with bladder lithotomy. After disinfection, aseptic drapes were placed and a uterine elevator was inserted through the vagina. A puncture needle was inserted about 3 cm above the umbilicus, and pneumoperitoneum was established with an insufflation pressure of 12-14 mmHg. After the procedure was completed, a laparoscope was inserted, and the patient's position was adjusted to a high hip and low head position under the monitoring of the laparoscope. Cannulation was performed under laparoscopic guidance at the lower abdomen on both sides, with 2 or 3 5-mm Trocar ports. The abdominal and pelvic cavities were thoroughly explored, and approximately 200 mL of 0.9% saline solution was used for irrigation of the abdominal and pelvic cavities. The irrigation fluid was then collected and sent for examination. Based on intraoperative exploration, ovarian tumors and adnexa were removed, and rapid frozen sections were performed to examine the tumor lesions. Bilateral

adnexectomy, hysterectomy, pelvic lymph node dissection, and abdominal aorta lymph node dissection were performed according to the pathological results. The excised tissues were placed in specimen bags.

Control group: In the control group (open surgery group), under general anesthesia, the patient was placed in a supine position. After routine disinfection and draping, the midline of the abdomen was used as the surgical incision. The abdomen was opened layer by layer to expose the lesion site, and the same tumor cell reduction technique as the laparoscopy group was performed. Postoperatively, all patients received chemotherapy when conditions allowed.

Observation indicators

Perioperative indicators: operation time, intraoperative bleeding volume, number of lymph nodes cleaned, postoperative anal exhaust time, time to get out of bed, and length of hospital stay.

Occurrence of complications: incision infection, pulmonary infection, urinary retention, venous thrombosis, and intestinal obstruction, *etc.*

Quality of life: The quality of life of patients was evaluated before surgery, 1 month after surgery, and 3 months after surgery using the Chinese version of the European Organization for Research and Treatment of Cancer Quality of Life Questionnaire. It includes 30 items with a total score of 126 points. A higher score indicates a better quality of life[15].

Stress response: 5 mL of fasting morning venous blood was taken before surgery and 1 d after surgery, centrifuged at 3000 rpm for 10 min to separate serum, and enzyme-linked immunosorbent assay was used to detect adrenocorticotropic hormone (ACTH), androstenedione (AD), and cortisol (Cor).

Immune function: 5 mL of fasting morning venous blood was collected before surgery and 1 day after surgery, and the supernatant was taken after centrifugation for flow cytometry to detect cluster of differentiation cluster of differentiation 3 positive (CD3+) and CD4+ levels.

Statistical analysis

Statistical analysis was performed using SPSS 22.0 statistical software. Continuous variables were expressed as mean ± SD and compared using *t*-test or *F*-test. Categorical variables were expressed as percentages [*n* (%)] and compared using χ^2 test. A *P*-value of less than 0.05 was considered statistically significant.

RESULTS

Comparison of baseline characteristics between the two patient groups

Study group (using laparoscopic ovarian cancer surgery) patients aged 35 to 66 years, with an average age of 55.0 ± 17.1 years; Body mass index (BMI) score of 24.1 ± 3.9 kg/m^2; tumor average diameter 6.84 ± 2.15 cm; FIGO clinical stage: stage I in 21 cases, accounting for 46.67%, stage II in 24 cases, accounting for 53.33%; pathological classification: mucinous carcinoma in 20 cases, accounting for 44.44%, serous adenocarcinoma in 16 cases, accounting for 35.56%, endometrioid carcinoma in 6 cases, accounting for 13.33%, clear cell carcinoma in 3 cases, accounting for 6.67%; control group (using open abdominal ovarian cancer surgery) patients aged 34 to 65 years, with an average age of 55.8 ± 18.8 years; BMI score of 24.7 ± 4.2 kg/m^2; tumor average diameter 6.92 ± 2.21 cm; FIGO clinical stage: stage I in 23 cases, accounting for 51.11%, stage II in 22 cases, accounting for 48.89%; pathological classification: mucinous carcinoma in 21 cases, accounting for 46.67%, serous adenocarcinoma in 15 cases, accounting for 33.33%, endometrioid carcinoma in 5 cases, accounting for 11.11%, clear cell carcinoma in 4 cases, accounting for 8.89%. The general clinical data of the research

group and the control group were compared, and there was no statistically significant difference ($P > 0.05$), indicating comparability, as shown in Table 1.

Comparison of perioperative conditions between two groups of patients

The research group had significantly less intraoperative bleeding compared to the control group. The postoperative anal exhaust time, time to get out of bed, and length of hospital stay were significantly shorter in the research group compared to the control group. The differences between the two groups were statistically significant ($P < 0.05$). There was no statistically significant difference in surgical time and number of lymph node dissections compared to the control group ($P > 0.05$), as shown in Table 2.

Comparison of incidence of complications between the two groups

The incidence of complications in the study group was significantly lower than that in the control group, with a statistically significant difference ($\chi^2 = 7.688$, $P < 0.05$), as shown in Table 3.

Comparison of quality of life between the two groups of patients

There was no statistically significant difference in preoperative quality of life scores between the study group and control group ($P > 0.05$); however, the postoperative 1-month and 3-month quality of life scores in the study group were significantly higher than those in the control group ($P < 0.05$), as shown in Table 4.

Comparison of stress response between the two groups

There was no difference in the preoperative levels of ACTH, AD, and Cor between the two groups ($P > 0.05$). However, after the surgery, all these indicators in the study group were significantly lower than those in the control group ($P < 0.05$), as shown in Table 5.

Comparison of immune function between the two groups

There was no difference in preoperative CD3+ and CD4+ levels between the two groups ($P > 0.05$). However, after the surgery, these indicators in the study group were higher than those in the control group ($P < 0.05$), as shown in Table 6.

DISCUSSION

Ovarian cancer is a common clinical condition. Early ovarian cancer refers to stage I and II Ovarian cancer. Due to its deep anatomical location, early ovarian cancer may have no typical clinical manifestations. It is often diagnosed when patients present with menstrual disorders, lower abdominal pain or discomfort, or palpable masses. Most patients are already in the advanced stage when diagnosed, and the treatment results are poor. Moreover, this disease has a high incidence and mortality rate. Surgery is one of the main treatment methods for early ovarian cancer. Open surgery is the traditional treatment method for early ovarian cancer, aiming to remove tumor tissue as much as possible to achieve a macroscopically tumor-free effect. However, this surgical approach has limitations such as large incisions and slow postoperative recovery[16]. In recent years, minimally invasive laparoscopic surgery under general anesthesia has been applied in the treatment of various diseases due to its minimally invasive advantages. Under laparoscopic visualization, it can fully utilize its advantages of minimally invasiveness and magnified vision, making the surgical procedure smoother[17]. With the further development of minimally invasive laparoscopic surgery under general anesthesia, adopting minimally invasive laparoscopic surgery under general anesthesia to treat early ovarian cancer will become a new standard procedure.

This study shows that the research group has lower blood loss and higher number of lymph node clearances compared to the control group. The postoperative exhaust time and length of stay in the hospital are both shorter, indicating that minimally invasive laparoscopic surgery under general anesthesia can significantly reduce intraoperative blood loss, improve the number of lymph node clearances, accelerate postoperative exhaust time, and shorten hospital stay. The analysis suggests that laparoscopy can enlarge the surgical field of view, better distinguish anatomical levels, and provide a

more comprehensive clearance of pelvic lymph nodes and para-aortic lymph nodes[18]. In addition, laparoscopic instruments are more delicate and can cut tissues closely, reducing damage to surrounding organs and minimizing intraoperative blood loss. On the other hand, open surgery has limited visual range and more restrictions on surgical instruments, resulting in fewer lymph node clearances and more blood loss during the procedure. Therefore, open surgery requires a longer recovery time and extended length of hospital stay compared to minimally invasive laparoscopic surgery under general anesthesia[19].

Surgical safety has always been an important concern in clinical practice. Studies have shown that the incidence and recurrence rates of complications were significantly lower in the study group compared to the control group, indicating that minimally invasive laparoscopic surgery under general anesthesia can significantly reduce postoperative complications and have a high level of safety. The reasons for this analysis are that minimally invasive laparoscopic surgery under general anesthesia causes less tissue damage, reduces the risk of postoperative infections and other complications, and promotes milder reflex spasms of the anal sphincter due to smaller incisions and less postoperative pain. As a result, the risks of postoperative urinary retention and urinary incontinence are lower[20,21]. At the same time, performing surgical treatment under laparoscopy allows physicians to clearly explore the diseased tissue and its surrounding tissues. With the magnification function of laparoscopy, physicians can more thoroughly remove tumor tissues, thereby reducing the postoperative recurrence rate and improving the prognosis of ovarian cancer patients[22].

Stress response mainly refers to the changes in various neuroendocrine systems in the body after trauma caused by surgery or anesthesia, which is closely related to the trauma of surgery[3]. ACTH is secreted by the pituitary gland and has the function of promoting the secretion of corticosteroids by the adrenal cortex. When the body is stimulated by trauma such as surgery, it can cause pituitary-adrenal axis excitation, which in turn triggers a series of neuroendocrine responses, belonging to the body's

adaptive stress response[23]. Some studies have pointed out that the higher the level of Cor, the more severe the trauma in patients. Sustained high levels of serum Cor can lead to patient death. Therefore, dynamic monitoring of serum Cor levels can serve as a sensitive indicator to evaluate the body's stress response, which helps in assessing the patient's stress status[24]. AD belongs to adrenal medullary hormones, which are rapidly metabolized in the body. Testing AD can help assess medullary function, maintain sympathetic nervous system activity, and promote normal heart rhythm. It is reported that the postoperative research group had lower levels of ACTH, AD, and Cor compared to the reference group, indicating that minimally invasive laparoscopic surgery under general anesthesia treatment for early-stage ovarian cancer patients had a smaller impact on the body's stress response. This may be related to the minimally invasive nature of minimally invasive laparoscopic surgery under general anesthesia, smaller surgical incisions, less damage to the abdominal-pelvic tissues, timely and reasonable hemostasis, and less trauma to the body, which can help reduce the body's stress response and promote postoperative recovery.

CD3+ is an antigen found on the surface of T lymphocytes, mainly mature T cells, and it represents the immune function of the body. CD4+ cells play an important role in the immune system, mainly expressed by helper T cells, and they are receptors for TCR recognition of antigens. Abnormal levels of T lymphocytes can lead to a decrease in physiological functions in the body[25,26]. The study concluded that the CD3+ and CD4+ markers in the postoperative research group were higher compared to the reference group, indicating that minimally invasive laparoscopic surgery under general anesthesia for early ovarian cancer has minimal impact on the immune function of patients. This may be due to the advantages of minimally invasive laparoscopic surgery under general anesthesia, such as minimally invasive and high safety, which can avoid damage to normal organ tissues of patients during surgery, thereby reducing damage to the body and minimizing the impact on immune function. At the same time, early ovarian cancer itself has a reduced immune function due to the influence of malignant tumors. Compared to open surgery, minimally invasive laparoscopic surgery under

general anesthesia can accurately and effectively remove tumors, contributing to the recovery of immune function. This further confirms the effectiveness and feasibility of minimally invasive laparoscopic surgery under general anesthesia for early ovarian cancer.

Limitations

As a retrospective study, this study also has limitations, such as the relatively small number of patients in the study, which may affect the universality of the results. Because the study is a retrospective collection of patients' clinical data, the potential confounding factors cannot be completely ruled out, which may have an impact on the rigor of the results. In the future, a large sample prospective study will be further carried out to further verify the accuracy of the results.

CONCLUSION

In summary, minimally invasive laparoscopic surgery under general anesthesia for early-stage ovarian cancer patients can further improve treatment efficacy, promote quick postoperative recovery, and have minimal impact on the body's stress response and immune function. The risk of postoperative complications is low.

REFERENCES

1 **Yin S**, Gao W, Shi P, Xi M, Tang W, Zhang J. Primary Laparoscopic Surgery Does Not Affect the Prognosis of Early-Stage Ovarian Clear Cell Cancer. *Cancer Manag Res* 2021; **13**: 6403-6409 [PMID: 34421313 DOI: 10.2147/CMAR.S321173]

2 **Najjar S**, Allison KH. Updates on breast biomarkers. *Virchows Arch* 2022; **480**: 163-176 [PMID: 35029776 DOI: 10.1007/s00428-022-03267-x]

3 **Kong Q**, Wei H, Zhang J, Li Y, Wang Y. Comparison of the survival outcomes of laparoscopy versus laparotomy in treatment of early-stage ovarian cancer: a systematic

review and meta-analysis. *J Ovarian Res* 2021; **14**: 45 [PMID: 33726795 DOI: 10.1186/s13048-021-00793-1]

4 **Garcia NG**, Moreno CS, Teixeira N, Lloret PE, Guibourg RL, Negre RR. Comparison of Laparoscopy and Laparotomy in the Management of Early-stage Ovarian Cancer. *Gynecol Minim Invasive Ther* 2023; **12**: 83-89 [PMID: 37416098 DOI: 10.4103/gmit.gmit_99_22]

5 **Park JY**, Heo EJ, Lee JW, Lee YY, Kim TJ, Kim BG, Bae DS. Outcomes of laparoscopic fertility-sparing surgery in clinically early-stage epithelial ovarian cancer. *J Gynecol Oncol* 2016; **27**: e20 [PMID: 26768783 DOI: 10.3802/jgo.2016.27.e20]

6 **Hou Y**, Peng Y, Li Z. Update on prognostic and predictive biomarkers of breast cancer. *Semin Diagn Pathol* 2022; **39**: 322-332 [PMID: 35752515 DOI: 10.1053/j.semdp.2022.06.015]

7 **Cianci S**, Capozzi VA, Rosati A, Rumolo V, Corrado G, Uccella S, Gueli Alletti S, Riccò M, Fagotti A, Scambia G, Cosentino F. Different Surgical Approaches for Early-Stage Ovarian Cancer Staging. A Large Monocentric Experience. *Front Med (Lausanne)* 2022; **9**: 880681 [PMID: 35547212 DOI: 10.3389/fmed.2022.880681]

8 **Wang Y**, Yin J, Li Y, Shan Y, Gu Y, Jin Y. Laparoscopic and Laparotomic Restaging in Patients With Apparent Stage I Epithelial Ovarian Cancer: A Comparison of Surgical and Oncological Outcomes. *Front Oncol* 2022; **12**: 913034 [PMID: 35795058 DOI: 10.3389/fonc.2022.913034]

9 **Timmerman D**, Planchamp F, Bourne T, Landolfo C, du Bois A, Chiva L, Cibula D, Concin N, Fischerova D, Froyman W, Gallardo Madueño G, Lemley B, Loft A, Mereu L, Morice P, Querleu D, Testa AC, Vergote I, Vandecaveye V, Scambia G, Fotopoulou C. ESGO/ISUOG/IOTA/ESGE Consensus Statement on pre-operative diagnosis of ovarian tumors. *Int J Gynecol Cancer* 2021; **31**: 961-982 [PMID: 34112736 DOI: 10.1136/ijgc-2021-002565]

10 **van de Vorst REWM**, Hoogendam JP, van der Aa MA, Witteveen PO, Zweemer RP, Gerestein CG. The attributive value of comprehensive surgical staging in clinically

early-stage epithelial ovarian carcinoma: A systematic review and meta-analysis. *Gynecol Oncol* 2021; **161**: 876-883 [PMID: 33849726 DOI: 10.1016/j.ygyno.2021.04.007]

11 **Lee S**, Ozkavukcu S, Ku SY. Current and Future Perspectives for Improving Ovarian Tissue Cryopreservation and Transplantation Outcomes for Cancer Patients. *Reprod Sci* 2021; **28**: 1746-1758 [PMID: 33791995 DOI: 10.1007/s43032-021-00517-2]

12 **Kim MK**, Hwang JH, Kim JH, Kim SR, Lee SB, Kim BW. Gasless Total Laparoscopic Hysterectomy with New Abdominal-Wall Retraction System. *JSLS* 2020; **24** [PMID: 32161436 DOI: 10.4293/JSLS.2019.00061]

13 **Wang T**, Xu Y, Chen Q, Zheng W, Wang J, Zeng H, Wu Y, Cao L, Chen Z. Metabolomics Analysis of Laparoscopic Surgery Combined with Wuda Granule to Promote Rapid Recovery of Patients with Colorectal Cancer Using UPLC/Q-TOF-MS/MS. *Evid Based Complement Alternat Med* 2020; **2020**: 5068268 [PMID: 32104193 DOI: 10.1155/2020/5068268]

14 **Aruparayil N**, Bolton W, Mishra A, Bains L, Gnanaraj J, King R, Ensor T, King N, Jayne D, Shinkins B. Clinical effectiveness of gasless laparoscopic surgery for abdominal conditions: systematic review and meta-analysis. *Surg Endosc* 2021; **35**: 6427-6437 [PMID: 34398284 DOI: 10.1007/s00464-021-08677-7]

15 **Jansen MR**, Vrielink OM, Faut M, Deckers EA, Been LB, van Leeuwen BL. One-Year Morbidity Following Videoscopic Inguinal Lymphadenectomy for Stage III Melanoma. *Cancers (Basel)* 2021; **13** [PMID: 33810068 DOI: 10.3390/cancers13061450]

16 **Ind T**. The current status of laparoscopic and robotic para-aortic lymphadenectomy in gynecologic cancer surgery. *J Gynecol Oncol* 2021; **32**: e28 [PMID: 33327049 DOI: 10.3802/jgo.2021.32.e28]

17 **Yoshikawa N**, Yoshida K, Tamauchi S, Ikeda Y, Nishino K, Niimi K, Suzuki S, Kikkawa F, Kajiyama H. The Preoperative Prognostic Nutritional Index for the Prediction of Outcomes in Patients with Early-Stage Ovarian Clear Cell Carcinoma. *Sci Rep* 2020; **10**: 7135 [PMID: 32346076 DOI: 10.1038/s41598-020-64171-5]

18 **Paterniti TA**, Ahmad S, Holloway RW. Robotic-assisted laparoscopic splenectomy for recurrent ovarian cancer. *Int J Gynecol Cancer* 2020; **30**: 1189-1194 [PMID: 32624496 DOI: 10.1136/ijgc-2020-001384]

19 **Xiong W**, Cao LL, Jiang LP, Xia H, Liang ZQ. [Clinical comparative analysis of comprehensive laparoscopic and laparotomic staging of early-stage epithelial ovarian cancer]. *Zhonghua Fu Chan Ke Za Zhi* 2017; **52**: 103-109 [PMID: 28253573 DOI: 10.3760/cma.j.issn.0529-567X.2017.02.007]

20 **Bouter ELM**, Lok C, Trum H. Robot-assisted laparoscopic staging compared to conventional laparoscopic staging and laparotomic staging in clinical early stage ovarian carcinoma. *Curr Opin Oncol* 2022; **34**: 490-496 [PMID: 35943438 DOI: 10.1097/CCO.0000000000000879]

21 **Søreide K**, Skjold-Ødegaard B, Thorsen K, Kørner H. Adhesions after open and laparoscopic abdominal surgery. *Lancet* 2021; **397**: 95-96 [PMID: 33422257 DOI: 10.1016/S0140-6736(20)32409-0]

22 **Jochum F**, Aubry G, Pellerin M, Billard C, Faller E, Boisrame T, Lecointre L, Akladios C. Relevance of Laparoscopic Surgery for Ovarian Cancer in Well-selected Patients: A Propensity-matched Comparison With Laparotomy. *Anticancer Res* 2021; **41**: 955-965 [PMID: 33517302 DOI: 10.21873/anticanres.14849]

23 **Chen X**, Li H, Wang S, Wang Y, Zhang L, Yao D, Li L, Gao G. Effects of Quantitative Nursing Combined with Psychological Intervention in Operating Room on Stress Response, Psychological State, and Prognosis of Patients Undergoing Laparoscopic Endometrial Cancer Surgery. *Comput Math Methods Med* 2022; **2022**: 6735100 [PMID: 36081429 DOI: 10.1155/2022/6735100]

24 **Lee CL**, Kusunoki S, Huang CY, Wu KY, Lee PS, Huang KG. Surgical and survival outcomes of laparoscopic staging surgery for patients with stage I ovarian cancer. *Taiwan J Obstet Gynecol* 2018; **57**: 7-12 [PMID: 29458907 DOI: 10.1016/j.tjog.2017.12.002]

25 **Ronsini C**, Pasanisi F, Molitierno R, Iavarone I, Vastarella MG, De Franciscis P, Conte C. Minimally Invasive Staging of Early-Stage Epithelial Ovarian Cancer versus

Open Surgery in Terms of Feasibility and Safety: A Systematic Review and Meta-Analysis. *J Clin Med* 2023; **12** [PMID: 37298026 DOI: 10.3390/jcm12113831]

26 **Gallotta V**, Jeong SY, Conte C, Trozzi R, Cappuccio S, Moroni R, Ferrandina G, Scambia G, Kim TJ, Fagotti A. Minimally invasive surgical staging for early stage ovarian cancer: A long-term follow up. *Eur J Surg Oncol* 2021; **47**: 1698-1704 [PMID: 33573854 DOI: 10.1016/j.ejso.2021.01.033]

Table 1 Basal characteristics of patients included in the study, according to surgical approach, *n* (%)

Index	Study group (*n* = 45)	Control group (*n* = 45)	t/χ^2 value	*P* value
Age (yr)	55.0 ± 17.1	55.8 ± 18.8	0.211	> 0.05
BMI (kg/m^2)	24.1 ± 3.9	24.7 ± 4.2	0.702	> 0.05
Tumor diameter(cm)	6.84 ± 2.15	6.92 ± 2.21	0.174	> 0.05
FIGO			0.178	> 0.05
I	21 (46.67)	23 (51.11)		
II	24 (53.33)	22 (48.89)		
Type of pathology			0.645	> 0.05
Mucinous cancer	20 (44.44)	21 (46.67)		
Serous carcinoma	16 (35.56)	15 (33.33)		
Endometrioid cancer	6 (13.33)	5 (11.11)		
Clear cell carcinoma	3 (6.67)	4 (8.89)		

BMI: Body mass index; FIGO: International Federation of Gynecology and Obstetrics.

Table 2 Perioperative comparison between study and control groups (mean ± SD)

Index	Study group (*n* = 45)	Control group (*n* = 45)	*t* value	*P* value
Duration of surgery (min)	257.41 ± 28.16	255.23 ± 28.37	0.366	> 0.05
Intraoperative bleeding quantity (min)	323.76 ± 40.25	387.44 ± 43.23	7.232	< 0.05
Lymph node clearance number of sweeps (pcs)	25.78 ± 3.35	26.04 ± 3.17	0.378	> 0.05
Postoperative anus exhaust time (d)	1.96 ± 0.42	2.61 ± 0.54	6.374	< 0.05
Get out of bed after surgery time (d)	2.85 ± 0.53	3.92 ± 0.64	8.638	< 0.05

Postoperative hospitalization time (d)	13.29 ± 2.11	16.66 ± 2.24	7.346	< 0.05

Table 3 Comparison of complications between study and control groups, *n* (%)

Index	Study group (*n* = 45)	Control group (*n* = 45)	χ^2 value	*P* value
Incision infection	1 (2.22)	2 (4.44)		
Lung infections	1 (2.22)	3 (6.67)		
Urinary retention	1 (2.22)	2 (4.44)		
Venous thrombosis	0 (0.00)	1 (2.22)		
Ileus	0 (0.00)	1 (2.22)		
Total	5 (6.67)	9 (20.00)	7.688	< 0.05

Table 4 Quality of life scores comparison between study and control groups (mean ± SD, points)

Index	Study group (*n* = 45)	Control group (*n* = 45)	*t* value	*P* value
Preoperatively	65.62 ± 9.58	66.12 ± 10.26	0.239	> 0.05
One month after surgery	66.25 ± 8.95	60.42 ± 8.53	3.163	< 0.05
Three months after surgery	78.95 ± 12.39	66.84 ± 11.34	4.837	< 0.05
F value	23.467	5.447		
P value	< 0.05	< 0.05		

Table 5 Comparison of the two sets of stress responses (mean ± SD)

Index	Group	Study group (n = 45)	Control group (n = 45)	t value	P value
ATCH (pmol/L)	Before surgery	11.22 ± 5.35	11. 64 ± 5.51	0.367	> 0.05
	After surgery	14.21 ± 12.03	20. 35 ± 12.37	2.387	< 0.05
AD (pmol/L)	Before surgery	30.35 ± 7.49	31. 22 ± 7.48	0.551	> 0.05
	After surgery	39.69 ± 8.71	46. 86 ± 7.36	4.218	< 0.05
Cor (nmol/L)	Before surgery	230.51 ± 8.92	231. 64 ± 8.76	0.606	> 0.05
	After surgery	299.13 ± 9.42	312. 02 ± 9.64	6.4150	< 0.05

ATCH: Adrenocorticotropic hormone; AD: Androstenedione; Cor: Cortisol.

Table 6 Comparison of the two groups of immune function (mean ± SD)

Index	Group	Study group (n = 45)	Control group (n = 45)	t value	P value
CD3 +	Before surgery	53.54 ± 5.07	55.56 ± 5.12	1.881	> 0.05
	After surgery	50.85 ± 5.16	43.12 ± 5.82	6.667	< 0.05
CD4 +	Before surgery	35.32 ± 4.95	33.91 ± 5.53	1.274	> 0.05
	After surgery	32.64 ± 3.06	27.61 ± 3.24	7.571	< 0.05

CD3+: Cluster of Differentiation 3 positive; CD4+: Cluster of Differentiation 4 positive.

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