Biomedical Research 2017; 28 (22): 10196-10200

ISSN 0970-938X
www.biomedres.info

Effect of laparoscopic surgery on treatment of endometrial carcinoma.

Shaoguang Wang*, Yaozong Dong, Xiaomei Meng

Department of Gynecology, the Affiliated Yantai Yuhuangding Hospital of Qingdao University, Yantai, Shandong, PR China

Abstract

Objective: To observe the application value of laparoscopic surgery in the treatment of endometrial carcinoma, and its influence on the level of serum tumor markers such as YKL-40, SCCAg, CYFRA21-1 and serum inflammatory factors such as hs-CRP, TNF-α, IL-4.

Methods: From January 2015 to May 2016, a total of 120 patients with endometrial carcinoma were enrolled in our hospital and divided into control group (n=60) and study group (n=60) randomly. Patients in control group were treated with conventional laparotomy and patients in study group were treated with laparoscopic surgery. The level of serum YKL-40, SCCAg, CYFRA21-1 and hs-CRP, TNF-α and IL-4 were measured by ELISA and then compared. The therapeutic effects of the two groups were also observed and compared.

Results: Before treatment, there was no significant difference in serum YKL-40, SCCAg and CYFRA21-1 between the two groups. After treatment, the values of serum YKL-40, SCCAg and CYFRA21-1 in the study group were significantly lower than those in the control group. Before treatment, there was no significant difference in serum hs-CRP, TNF-α and IL-4 between the two groups. After treatment, the values of serum hs-CRP, TNF-α and IL-4 in the study group were significantly lower than those in the control group. The total effective rate of the study group was 93.3%, significantly higher than 86.7% of the control group. All 120 patients were followed up from the shortest follow-up period of one month to the longest of 12 months, with no recurrence or postoperative complication in the study group, while one vaginal recurrence case in the control group who received radiotherapy.

Conclusion: Laparoscopic surgery was superior to conventional laparotomy for patients with endometrial carcinoma for reducing values of serum YKL-40, SCCAg, CYFRA21-1, hs-CRP, TNF-α, IL-4 and recurrence rate effectively, which worthy of promotion and application.

Keywords: Laparoscopic surgery, Endometrial carcinoma, Laparotomy, Tumor markers.

Accepted on December 12, 2017

Introduction

Endometrial Carcinoma (EC) is one of the three most common malignant tumors in female reproductive system and the highest of female malignant tumors in developed countries among Europe and America [1]. With the change of modern lifestyle, the incidence of EC has increased recently with high fatality rate relatively [2]. There are usually no obvious clinic symptoms for patients with EC which most found in the process of physical examination occasionally. At present, the standard treatment for EC is total abdominal hysterectomy accompanied with bilateral adnexectomy. Although effective, abdominal hysterectomy caused a high incidence of complications in perioperative period especially for patients combined with obesity and other diseases [3]. In recent years, many studies have proved that laparoscopic surgery has advantages of shorter hospitalization time, less perioperative complications and faster postoperative recovery than traditional open surgery in the treatment of benign diseases [4]. However, there are few studies of laparoscopy for EC to evaluate its efficacy and safety accurately limited by small sample size and limited follow-up. Besides it is also reported that there are risks of puncture and vaginal metastasis after laparoscopic treatment for EC [5]. Therefore, the study aimed to observe the application value of laparoscopic surgery in the treatment of EC, and its influence on the values of serum tumor markers such as chitinase protein 40 (YKL-40), Squamous Cell Carcinoma Antigen (SCCAg), cytokeratin fragment antigen21-1 (CYFRA21-1) and serum inflammatory factors such as Hypersensitivity c-Reactive Protein (hs-CRP), Tumor Necrosis Factor α (TNF-α) and Interleukin 4 (IL-4), to provide reference for the clinical treatment of EC.

Materials and Methods

General information

From January 2015 to May 2016, a total of 120 patients with EC were enrolled in our hospital. The average age of all patients involved was 40.7 ± 1.9 y. Among them, 40 cases were at Ia, 50 cases at Ib and 30 cases at IIa stage. As to pathological pattern, 60 cases of them were squamous cell carcinoma, 50 cases were adenocarcinoma and 10 cases were aquamous adenocarcinoma. All patients were diagnosed as EC and received the treatment with high compliance after informed consent accepted. Those combined with serious cardio-cerebral diseases or contraindications for surgery were excluded from the study. Patients were divided into control group (n=60) and study group (n=60) randomly with no significant difference between the two groups in general data (Table 1).

Table 1. Comparison of general data between two groups.

Basic clinical characteristics	Control group	Study group	P
Age (y)	41.2 ± 1.5	40.5 ± 1.2	0.291
Size of cancer			0.752
<5 cm	38	37	
≥ 5 cm	22	23	
Clinical stages			0.198
Ia	20	20	
Ib	26	24	
IIa	14	16	
Case types			0.325
Squamous cell carcinoma	30	30	
Adenocarcinoma	25	25	
Squamous adenocarcinoma	5	5	

Methods

Patients in the two groups were given vaginal irrigation and bowel preparation for one to three days before the operation, as well as umbilicus cleaned, with food and water intake as usual. Then patients in the control group were treated with laparotomy under continuous epidural anesthesia or tracheal intubation general anesthesia in hip-padded supine position according to tumor stage.

And patients in the study group received laparoscopic assisted vaginal surgery as follows: performing tracheal intubation general anesthesia, taking bladder lithotomy position and then trendelenburg position after eyepiece inserted, completing skin preparation and draping routinely, inserting catheter and retaining open continuously with uterine manipulator inside, cutting a longitudinal incision about 1cm above the umbilicus at 2 cm, inserting 10 mm puncture cannula, injecting carbon dioxide for pneumoperitoneum with intra-abdominal pressure between 12 mmHg to 15 mmHg, implanting laparoscopic, inserting10 mm trocar from the second puncturing point at the intersection of the lateral border of rectus abdominis and 2 cm above the umbilical line and 5 mm trocars from the third puncturing point at McBurney's point and the fourth puncturing point at anti-McBurney's point respectively in trendelenburg position, performing pelvic exploration, reserving 50 ml peritoneal lavage fluid or ascites, performing bilateral excision and extensive hysterectomy according to the clinical stage, suturing the vaginal stump through vagina, examining exudation and bleeding in the wound surface and stump, irrigating the pelvic and abdominal cavity, placing drainage tube, releasing the gas and suturing the puncture holes.

Observation indexes

The values of serum YKL-40, SCCAg, CYFRA21-1, hs-CRP, TNF-α and IL-4 were measured by ELISA and compared between the two groups by 5 ml fasting venous blood before and after treatment. Patients' short-term efficacy was observed six months after the treatment and the recurrence observed by followed up with an average of 12 months. The efficacy criteria were Complete Remission (CR), Partial Remission (PR), no response, and deterioration [6]. The effective rate of treatment=(cases of complete remission and partial remission)/ total cases × 100%. And it was regarded as recurrence when cancer cells were found in patients of complete remission.

Statistical analysis

All statistical analyses were processed with SPSS 21.0 software package. The enumeration data and measurement data were compared with Chi-square test and paired sample t-test respectively. A p-value lower than 0.05 is referred to be statistically significant.

Results

Comparison of values of serum tumor markers between two groups before and after treatment

Before treatment, there was no significant difference in values of serum YKL-40, SCCAg and CYFRA21-1 between two groups. Then these values of the study group were all significantly lower than those of the control group after treatment (Table 2).

Comparison of values of serum inflammatory factors between two groups before and after treatment

Before treatment, there was no significant difference in values of serum hs-CRPTNF-α and IL-4 between two groups. Then these values of the study group were all significantly lower than those of the control group after treatment (Table 3).

Comparison of short-term efficacy between two groups

The total effective rate of the study group was 93.3%, which was significantly higher than 86.7% of the control group (Table 4).

Table 2. *Comparison of values of serum tumor markers between two groups before and after treatment.*

Groups	n	YKL-40 (ng/ml)		SCCAg (μg/L)		CYFRA21-1 (mg/L)	
		Before	After	Before	After	Before	After
Control	60	584.21 ± 45.32	232.01 ± 32.04	4.21 ± 0.64	1.56 ± 0.22	3.32 ± 0.79	2.01 ± 0.35
Study	60	583.69 ± 48.21	187.32 ± 29.17	4.19 ± 0.75	1.04 ± 0.17	3.31 ± 0.68	1.44 ± 0.26
t		0.17	6.04	0.10	6.05	0.30	7.65
P		0.287	0.025	0.310	0.022	0.161	0.017

Table 3. *Comparison of values of serum inflammatory factors between two groups before and after treatment.*

Groups	n	hs-CRP (mg/m L)		TNF-α (μg/L)		IL-4 (pg/L)	
		Before	After	Before	After	Before	After
Control	60	25.43 ± 3.98	13.09 ± 1.75	4.19 ± 0.64	1.92 ± 0.32	4.45 ± 0.21	3.04 ± 0.15
Study	60	25.41 ± 3.93	8.06 ± 1.27	4.18 ± 0.62	1.21 ± 0.22	4.43 ± 0.35	2.58 ± 0.21
t		0.16	7.69	0.19	8.10	0.40	9.05
P		0.285	0.015	0.291	0.009	0.113	0.005

Table 4. *Comparison of short-term efficacy between two groups.*

Groups	n	Complete remission	Partial remission	No response	Deterioration	Effective rate (%)
Control	60	43	9	7	1	86.7
Study	60	37	19	4	0	93.3
χ^2						7.46
P						0.019

Discussion

There are usually no obvious clinic symptoms for patients with EC in early stage. Then with the progression of the disease, symptoms appear as [6,7]: prolonged menstruation and increased volume or vaginal bleeding slightly in menopause patients; malodorous bloody or serous vaginal discharge, for which about 1/4 of EC patients visited doctor; lower abdominal pain characterized by distending or spasmodic because of cancer cells infiltrating adjacent tissues or compressing the nerves.

Laparoscopy is a new surgical method which is widely used for the examination and operation of various diseases in recent years. Compared with traditional surgery, laparoscopic surgery has the following advantages [8,9]: no large incision caused by laparotomy, less blood loss, and stanching conveniently; quick postoperative incision recovery as well as small scar for the needs of beauty; less risk of infection as small incision exposed in the air; with real-time and clear vision of the abdominal cavity under laparoscope, resecting the tumor tissues completely so as to avoiding reoperation, not only alleviating patient's pains but saving medical resources. Simultaneously there are also some disadvantages for the method [10,11]: it is difficult to detect intraoperative complications in time or to deal with timely and effectively because of the small incision; high requirements for operators, otherwise the effect of operation will be affected seriously as well as unnecessary hurt to patients' normal tissues; it is easy to cause hypercapnia in patients when injecting carbon dioxide for pneumoperitoneum, thus affecting the prognosis of the disease.

In this study the total effective rate of the study group was 93.3%, which was significantly higher than 86.7% of the control group. And all 120 patients enrolled were followed up from one month to 12 months including exfoliative cytology

examination of vagina and pelvic cavity, and imaging examinations such as Doppler ultrasonography, CT and MRI. There was no recurrence case or postoperative complication in the study group, while one recurrence case in the control group who received radiotherapy. It suggested that laparoscopic surgery was superior to conventional laparotomy in better surgical effect and lower recurrence rate.

YKL-40, SCCAg and CYFRA21-1 are new tumor markers applied in clinic of high value for cancer screening and early diagnosis and treatment in recent years. Related data showed that [12,13] YKL-40 is highly expressed in gynecological tumor tissues like ovarian cancer and EC, whose level is closely related to the stage and grade of tumor. There are also studies [14,15] shown that SCCAg can be used in the evaluation of prognosis and the diagnosis of recurrence for patients with EC during radiotherapy and chemotherapy. CYFRA21-1 is an important tumor marker highly expressed in EC patients and may serve as a new index for the diagnosis and prognosis of endometrial adenocarcinoma, although not used in the diagnosis of EC yet. And in this study, there was no significant difference in values of serum YKL-40, SCCAg and CYFRA21-1 between two groups before treatment, and then values of these serum tumor markers of the study group were all significantly lower than those of the control group after treatment. It suggested that laparoscopic surgery for EC patients can reduce the values of serum YKL-40, SCCAg, CYFRA21-1 effectively.

It has been reported that [16,17], inflammatory response is involved actively in the occurrence and development of malignant tumors such as EC or others. Hs-CRP, TNF-α and IL-4 are important cytokines that regulate immune system and released largely from mononuclear macrophages when inflammatory response happens. Thus, the chronic inflammation in EC patients can be reflected in the values of these serum inflammatory factors to a certain degree. And in this study, there was no significant difference in values of serum hs-CRP, TNF-α and IL-4 between two groups before treatment, and then values of these serum inflammatory factors of the study group were all significantly lower than those of the control group after treatment. It suggested that laparoscopic surgery can control the development of the disease by decreasing the values of serum inflammatory factors such as hs-CRP, TNF-α and IL-4.

In conclusion, laparoscopic surgery was superior to conventional laparotomy for the treatment of EC patients in reducing the values of serum YKL-40, SCCAg, CYFRA21-1 and hs-CRP, TNF-α, IL-4, and reducing the recurrence rate effectively, and well worth promoting and applying.

References

1. Melicow MM, Pachter MR. Endometrial carcinoma of prostatic utricle (uterus masculinus). Cancer 2015; 20: 1715-1722.
2. Greven KM, Lanciano RM, Corn B. Pathologic stage III endometrial carcinoma. Prognostic factors and patterns of recurrence. Cancer 2015; 71: 3697-3702.
3. Carter JR. Laparoscopy or laparotomy for endometrial cancer? A review of three prospective randomised trials. Aust N Z J Obstet Gynaecol 2011; 51: 387-392.
4. Malzoni M, Tinelli R, Cosentino F. Total laparoscopic hysterectomy versus abdominal hysterectomy with lymphadenectomy for early-stage endometrial cancer: a prospective randomized study. Gynecol Oncol 2009; 112: 126-133.
5. Maenpaa JU, Nyberg R, Parkkinen J. Port-site metastasis following laparoscopic hysterectomy and bilateral salpingo-ophorectomy for endometrial carcinoma. Eur J Obstet Gynecol Reprod Biol 2009; 143: 61-62.
6. Holub, Z, Bartos, P, Eim, J. Laparoscopic surgery of endometrial cancer: results of four years multicentric study. Eur J Gynaecol Oncol 2002; 23: 305-310.
7. Muntz HG, Goff BA, Madsen BL. Port-site recurrence after laparoscopic surgery for endometrial carcinoma. Obstetr Gynecol 1999; 93: 807-809.
8. Sanjuan A, Hernandez S, Pahisa J. Port-site metastasis after laparoscopic surgery for endometrial carcinoma: two case reports. Dig World Lat Med Info 2005; 96: 539-542.
9. Holub Z, Voracek J, Shomani A. A comparison of laparoscopic surgery with open procedure in endometrial cancer. Eur J Gynaecol Oncol 1998; 19: 294-296.
10. Turunen H, Pakarinen P, Sjöberg J. Laparoscopic vs. robotic-assisted surgery for endometrial carcinoma in a centre with long laparoscopic experience. J Inst Obstetr Gynaecol 2013; 33: 720-724.
11. Lee CL, Huang KG, Wu PJ. Long-term survival outcome of laparoscopic staging surgery for endometrial cancer in Taiwanese experience. Taiwan J Obstetr Gynecol 2014; 53: 57-61.
12. Johansen JS. Studies on serum YKL-40 as a biomarker in diseases with inflammation, tissue remodeling, fibrosis and cancer. Danish Med Bull 2006; 53: 172-209.
13. Soran MG. Role of non-steroidal anti-inflammatory drugs in acute upper gastrointestinal bleeding. Univ J Pharm Res 2016; 1: 20-30.
14. Williams M, Swampillai A, Osborne M. Squamous cell carcinoma antigen: a potentially useful prognostic marker in squamous cell carcinoma of the anal canal and margin. Cancer 2013; 119: 2391-2398.
15. Giaccone G, Clerico M, Donadio M. Chemotherapy of a second instance of carcinoma of the ovary. Miner Ginecol 2010; 36: 195-198.
16. Schoppmann SF, Schindl M, Breiteneder-Geleff S. Inflammatory stromal reaction correlates with lymphatic microvessel density in early-stage cervical cancer. Anticancer Res 2001; 21: 3419-3423.
17. Dingwoke JEF. Development and evaluation of matrix type transdermal patches of pioglitazone hydrochloride. Univ J Pharm Res 2016; 1: 31-37.

***Correspondence to**

Shaoguang Wang

Department of Gynecology

The Affiliated Yantai Yuhuangding Hospital of Qingdao University

PR China