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Effect of Ovarian Transposition Therapy on Ovarian Function, Ovarian Blood Flow and Sexual Life Quality in Patients with Cervical Cancer

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ABSTRACT

Objective To study the ovarian function, blood flow and quality of life in patients with cervical cancer after ovarian transposition. **Methods** 114 patients with cervical cancer during January 2015 to January 2016 were retrospectively analyzed, patients who don't need ovarian transposition treatment were included in the control group (38 cases), and those who need ovarian transposition treatment were included in observation group, those who had accepted operation but not radiotherapy were in observation group 1 (38 cases), and those who had accepted operation and radiotherapy were in observation group 2 (38 cases). Then the ovarian function, ovarian blood flow and sexual life quality and complication were compared in each group. **Results** P, E_2, LH and FSH indexes of all patients before operation showed no significant difference in statistical analysis ($P > 0.05$), after 12 months of follow-up, ovarian function index changes were observed in 2 groups, and the other two groups had significant difference ($P < 0.05$); preoperative blood group hemodynamic indexes were no significant difference ($P < 0.05$), after treatment, 2 groups' RI was observed and was higher than other groups, and the difference between groups was significant ($P < 0.05$); The quality of sex life in the observation group was significantly higher than that in the control group, and the 2 groups had a statistically significant difference ($p<0.05$) compared to the 2 groups. In addition, the incidence rate of each group of complications was compared,

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observation 1 group and observation 2 group were higher than the control group, the statistical analysis of the group was significantly different ($p<0.05$). **Conclusion** Cervical cancer patients with ovarian shift after treatment, postoperative can still preserving ovarian function and sexual life quality also increased significantly, but the postoperative patients complicated with abdominal pain, without functional ovarian cysts; If ovarian shift line of postoperative radiation therapy, there are side effects on the ovarian function and sexual life. After the ovarian transposition treatment for patients with cervical cancer, they can still retain ovarian function, and the sexual life quality is also significantly improved, but abdominal pain and non-functional ovarian cyst may occur; if the radiation therapy was given after ovarian transposition, then side effects will appear in the ovarian function and sex life.

0 Introduction

The precancerous lesion period of cervical cancer is long, so the clinical early diagnosis is more difficult [1]. With the gradual development and improvement of the census of cervical cancer in China, more and more women's self-awareness and early diagnosis rate are increasing, but there are still high morbidity and mortality, and the onset age is getting younger [2]. At present, the clinical treatment of cervical cancer mainly through surgery, radiotherapy, chemotherapy and comprehensive treatment to improve the quality of life and survival rate. For many young patients with cervical cancer, the retention of ovarian surgery is more easily to accepted, so the emergence of ovarian transposition therapy provides a new turnaround for patients with cervical cancer [3-4]. There has been a great deal of research on the importance of preserving ovarian function after surgery for patients in the past, however, research on the effects of ovarian transposition on the postoperative sexual function of patients were less, so in view of this, the effects of ovarian transposition therapy on ovarian function, ovarian blood flow and sexual life in patients with cervical cancer were discussed in detail as follows:

1 Materials and methods

1.1 General materials

114 patients with cervical cancer during January 2015 to January 2016 were retrospectively analyzed, patients who don't need ovarian transposition treatment were included in the control group (38 cases), and those who need ovarian transposition treatment were included in observation group. Included standard: FIGO clinical staging is in I_{b1}～II_b; no tumor recurrence or transfer during the follow-up period; be voluntary in participating the research, and the family was informed and signed informed consent; patients with serious diseases such as hypertension, heart disease, diabetes, coagulation dysfunction, lung infection, severe mental illness, history of vaginal surgery, pelvic surgery, or sexual dysfunction were excluded in the research[5]. Through retrospective analysis of case data, it was found that in the control group (only were given bilateral tubal resection and pelvic lymph node dissection): age in 25~58 years old, average (39.86±5.48) years old, FIGO stage: 18 cases in I_b period, 15 cases in II_a period, 5 cases in II_b period, postoperative pathology diagnosis: Squamous cell carcinoma/adenocarcinoma 29/9 cases. In the observation group, 76 cases' FIGO stage were all in I_a ～ II_a stage, group 1(combined with ovarian translocation): age in 23~59 years old, average (38.49±6.48) age, FIGO stage: 26 cases in I_b period, 12 cases in II_a period; postoperative pathological diagnosis: squamous cell carcinoma/adenocarcinoma 27/ 11. Observation group 2 (combined with ovarian transposition + radiotherapy): age in 23~59 years old, average (38.49±6.48) years old; FIGO stage: 19 cases

in I_b period, 19 cases in II_a period, squamous cell carcinoma/adenocarcinoma 24/14. There was no significant difference in statistical analysis of baseline data of each group ($p>0.05$), which could be statistically analyzed.

1.2 Method

All the cases were undergoing extensive hysterectomy, combined with bilateral tubal resection and pelvic lymph node dissection. If the diameter of original lesion was found within 2cm in the operation, and deep muscle layer was not been found by naked eye, or the pelvic lymph was not enlarged obviously, then ovarian displacement was not necessary for the patient (the control group). Observation group 1: combined ovarian translocation, ovarian arteriovenous was dissociated, the length was about 12~14cm, and protected the proximal side of the peritoneum, along the side of the sneak separation, a tunnel was formed, and then through the tunnel, lift the ovary to 3cm of the lateral colonic bypass—ilium where the internal and external iliac artery diverge, and paid attention to wrap blood vessels, and opened the peritoneum, put the ovary into the abdominal cavity, fixed the suture, and 3 silver clips are placed around the ovary. Observation group 2: on the basis of the observation group 1, combined postoperative radiotherapy, the dosage was 80~180cGy, 4 times a week, two-day interval between two treatments.

1.3 Observation indicators

The changes of ovarian function, blood flow, sexual quality of life and postoperative complications were observed in each group. The changes of P, E_2, LH and FSH were mainly analyzed in ovarian function evaluation. Sexual function Evaluation: using FSFI standard, and mainly on 6 aspects: sexual desire, sexual excitement, pain, orgasm, vaginal lubrication, pain and sexual satisfaction, and 6 points for each aspect and total point is 36. The higher the score, the more satisfied in the sex life. The sexual life quality is excellent: the score is above 30 points; Normal: between 23~30 points; Bad: below 23 points [6].

1.4 Statistical analysis

This statistic uses software SPSS18.0 in data processing; age, hormone level, blood flow parameter and FSFI score were indicated by（ $\bar{x}\pm s$）and tested by t test; complication condition was indicated by (n,%) and tested by $\chi 2$ test; $p<0.05$ represents statistically significance in the data of groups.

2 Results

2.1 Analysis of the changes of ovarian function after operation in each group

Before the operation, the levels of P, E2, LH and FSH in each group were not statistically significant, $p>0.05$; after treatment, during follow-up observation after 1 month and 3 months, there was no significant difference ($p>0.05$); during follow-up 1 month after the operation, there are significant differences between the indicators of patients in observation group 2 and the control group (observation group 1) ($p<0.05$), see table 1:

Groups	Time	P	E_2（pmol/L）	LH（U/L）	FSH（U/L）
Control group	Before operation	10.98±1.93	346.24±20.38	10.02±2.19	10.47±1.68
	1 month after	11.05±2.34	348.16±21.67	9.35±2.35	10.50±2.04
	3 months after	10.25±3.01	346.51±19.64	10.45±1.99	9.68±3.02
	12 months after	11.15±2.01*	351.02±20.45*	11.26±2.65*	9.75±2.49*
Observation group 1	Before operation	11.02±2.65	345.68±19.58	10.26±2.84	10.35±2.05
	1 month after	10.35±2.15	349.25±20.58	11.64±2.71	10.42±1.95
	3 months after	11.02±2.42	350.48±21.34	10.68±1.69	11.42±2.48
	12 months after	11.08±1.96*	348.05±19.75*	11.35±2.47*	11.05±2.64*
Observation group 2	Before operation	11.02±2.65	345.68±19.58	10.26±2.84	10.35±2.05
	1 month after	10.35±2.15	349.25±20.58	10.64±2.71	11.42±1.95
	3 months after	11.25±2.68	345.54±26.59	11.35±3.50	11.52±2.42
	12 months after	8.02±1.30	321..68±20.68	8.42±1.52	8.15±1.06

Table 1. Analysis of the changes of ovarian function after operation in each group（n, %）

Note: *means comparison with observation group 2，*P＜0.05.

2.2 Comparative analysis of blood flow in patients with different groups

The results showed that there were no statistically significant differences between the peak blood flow velocity, the end diastolic blood flow velocity and RI in the systolic period before treatment and after treatment, and the difference between the observation group 2 and the other two groups was obvious ($p<0.05$), see details in table 2:

Groups	Peak systolic velocity		End diastolic velocity		RI	
	Before treatment	After treatment	Before treatment	After treatment	Before treatment	After treatment
Control group	52.35±11.02	53.65±11.48*	15.21±2.65	16.25±2.47*	0.75±0.12	0.81±0.34*
Observation group 1	51.64±10.98	52.39±12.67*	14.69±2.01	13.65±2.93*	0.84±0.13	0.83±0.15*
Observation group 2	53.14±11.05	59.65±13.98	15.34±2.49	10.35±1.02	0.81±0.24	0.99±0.12

Table 2. Comparative analysis of blood flow in patients with different groups

Note: * means comparison with observation group 2, *P＜0.05.

2.3 Comparative analysis of sexual function quality of patients in different groups

FSFI score showed that in the observation group, sexual desire, sexual arousal, orgasm, and sexual satisfaction scores were significantly higher than those in the control group, and difference was statistically significant(p<0.05); and scores of those indicators in observation group 2 lower than group 1, and difference was statistically significant (p<0.05=, see table 3:

Groups	sexual desire	sexual arousal	orgasm	vaginal lubrication	pain	sexual satisfaction
Control group [a]	2.43±0.82	2.61±1.02	2.31±0.95	0.95±0.19	2.16±0.43	1.67±0.94
Observation group 1[b]	4.21±1.05	4.51±2.36	4.48±2.18	4.31±1.06	4.02±0.95	4.52±1.95
Observation group 2[c]	3.56±0.95	3.48±1.95	3.58±1.64	2.98±0.68	3.26±0.59	3.35±1.25
t^{ab}	8.2362	4.5719	5.6252	19.2334	10.9954	8.1157
^{ab}P	＜0.01	＜0.01	＜0.01	＜0.01	＜0.01	＜0.01
t^{ac}	5.5506	2.4370	4.1306	17.7237	9.2879	6.6216
^{ac}P	＜0.01	0.0172	0.0001	＜0.01	＜0.01	＜0.01
t^{bc}	2.8297	2.0740	2.0337	6.5102	4.1893	3.1138
^{bc}P	0.0060	0.0416	0.0456	＜0.01	0.0001	0.0026

Table 3. Comparative analysis of sexual function quality in patients with different groups（ $\bar{x}\pm s$）

2.4 Analysis of postoperative complications of patients in each group

The postoperative complications of each group were compared, and the total incidence of 2 groups was 665.79%, which was significantly higher than that in the control group (15.79%), and there was significant difference between groups by statistical analysis (p<0.05=, and compared with the observed group 1, there was not significant difference (p>0.05), see table 4:

Groups	abdominal pain	urinary retention	Non-function ovarian cyst	Shift metastasis in ovarian carcinoma	Total incidence rate
Control group [a]	3（7.89）	2（5.26）	1（2.64）	0（0）	6（15.79）
Observation group 1[b]	8（21.05）	4（10.52）	4（10.52）	1（2.64）	17（44.73）
Observation group 2[c]	12（31.57）	6（15.79）	6（15.79）	1（2.64）	25(65.79)
t^{ab}	2.6573	0.7238	1.9268	1.0133	7.5439
^{ab}P	0.1031	0.3949	0.1651	0.3141	0.0060
t^{ac}	6.7279	2.2353	3.9337	1.0133	11.8004
^{ac}P	0.0095	0.1348	0.0473	0.3141	0.0006
t^{bc}	1.0857	0.4606	0.4606	0.0000	1.5441
^{bc}P	0.2974	0.4973	0.4973	1.0000	0.2140

Table 4. Analysis of postoperative complications of patients in each group（n, %）

3 Discussion

Cervical cancer has become an important malignant cancer disease that plagues women. At present, main clinical treatment are surgery and conservative treatment, and in view of cervical cancer surgery can not immediately determine whether the patient need further radiotherapy, so ovarian transposition can not only achieve the goal of treatment, but also can protect the ovarian function [7-8]. If adjuvant chemotherapy is not performed after surgery, the risk of serious adverse consequences for the displaced ovaries is also small. Domestic and foreign related literatures [9-10] reported that early implementation of ovarian transposition of cervical cancer have better protection for the ovarian function after surgery, and a foreign literature [11] reported that patients after the ovarian transposition treatment can still have ovarian function after the treatment. A study conducted to ovarian transposition treatment, and observed patients without radiotherapy after observation, and the results found that only 1 patient had mild peri-menopausal symptom after operation, and the FSH was significantly increased, estradiol level significantly decreased, ovarian function and hormone level in ovarian failure are comparable; compared with patients with total hysterectomy, there was no significant difference between hormone levels and perimenopausal symptoms, which then showed

that ovarian transposition therapy did not have a serious effect on ovarian function, and this result was consistent with most previous findings. However, it is noteworthy that after the ovarian transposition, abdominal pain and asymptomatic ovarian cysts always appeared after operation, so in order to effectively prevent postoperative complications, we need to pay attention that the ovarian arteriovenous operation should be in the 10~12cm, so as to avoid the ovarian vascular distortion phenomenon, and it can also ensure that the displaced ovary is fixed on the displaced peritoneum according to the anatomical structure, and the ovarian vascular torsion can be avoided, and the survival rate of ovary after displacement can be improved. Qiao [12] etc. has long been confirmed the effects of ovarian transposition therapy on hemodynamics in patients with cervical cancer. If radiotherapy was given after ovarian transposition therapy, the RI of patients significantly increased. And the researcher further analyzed the correlation between changes in blood flow resistance index and ovarian function, and the results found a negative correlation between RI and estradiol, and positive correlation between RI and FSH. But the results of this study can only prove the negative correlation between RI and estradiol, and the current argument about this view is still controversial, so it needs to be further explored. The study found that the supply of ovarian blood flow and ovarian function is closely related and clinical operation can further understand the ovarian function by testing ovarian blood flow, and postoperative radiotherapy not only will kill normal ovarian cells, but also affect the supply of ovarian blood, and then lead to ovarian function decline. According to the analysis of ovarian function index in this study, the ovarian transposition therapy only did not have a significant effect on the hormone level of patients, but it will have a significant change in hormone levels if combined with radiotherapy, which confirmed the above statement. Hao Furong's [13] clinical research found that combined radiotherapy after ovarian transposition in patients with cervical cancer can have a certain adverse effect on ovarian function, but the recurrence rate is lower. Zhou Qi [14] and other people also said that although the ovarian transposition treatment of patients have a significant improvement in sexual life quality and also can retain the ovarian function, but radiotherapy can cause a certain side effects on ovarian function of sexual life quality. Perhaps because of the high sensitivity of the ovary to radioactivity, when a single dose of radiation reached 400cGy, or multiple doses reached 1500cGy, it will most likely lead to ovarian failure, so the clinical research showed that pelvic external radiation the most important reason for the decline of ovarian function. In ovarian transposition treatment, the location of the ovary to 2cm above the anterior superior iliac spine does not prevent the damage caused by radiation exposure to the ovary, and therefore the ovarian function decreases even if the ovarian was translocated. In view of this, a researcher boldly hypothesized [15] that in ovarian transposition, lift the ovary at least 4cm to the iliac ridge, then it may reduce the radiotherapy to the ovarian function, but whether the hypothesis is reasonable still needs to be proved for the clinical scholars.

Results: Conventional cervical cancer surgery and pelvic lymphatic dissection combined with the treatment of ovarian transposition alone, postoperative ovarian function did not change significantly, and hemodynamic analysis was not significantly different, but postoperative patients' sexual life quality have been improved significantly and abdominal pain and dysfunction of ovarian cyst rate is higher after operation. After the ovarian transposition combined with radiotherapy, patients' P, E_2, LH and FSH levels were significantly decreased from 12-month follow-up results, which shows that radiotherapy after the ovarian transposition therapy will affect the ovarian function of patients, and the sexual life quality of them were worse than those who have accepted ovarian transposition

only. In that case, postoperative radiotherapy can also affect the sexual life quality in patients after ovarian transposition.

To sum up, for the patients with cervical cancer, conventional surgical treatment combined with simple ovarian transposition therapy can effectively retain the ovarian function and improve sexual life quality, but postoperative complications should not be ignored; if radiotherapy was given after the ovarian transposition surgery, the patient's ovarian function and sexual life would be affected, and ovarian blood flow can also be seriously affected. Therefore, the selection of therapic plan should be prudent, and indications after ovarian transposition should be clear, so as to improve the quality of life after surgery.

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