



## Effect of uterine arterial embolization on symptomatic uterine fibroids and ovarian function

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### ARTICLE INFO

#### Article history:

Received  
Received in revised form  
Accepted  
Available online

#### Keywords:

Uterine arterial embolization  
Symptomatic uterine fibroids  
Ovarian function

### ABSTRACT

**Objective:** To investigate the effect of uterine artery embolization (UAE) in the treatment of symptomatic uterine fibroids and the effect on ovarian function. **Methods:** Clinical data of 20 UAE cases admitted from August 2014 to August 2015 were retrospectively analyzed. They had uterine leiomyoma, and received UAE after menstruation 3-7 d. Seldinger technology was used to puncture the right femoral artery, microspheres was alginate or polyvinyl alcohol particles were injected into the target vessel embolism vascular leiomyoma. Broken Gelfoam embolization of uterine artery was used to stop fibroids blood supply; imaging examination of symptomatic uterine fibroids was performed before and 3 months, 6 months, 12 months after UAE. The volume of uterus myoma volume changes was observed; luteinizing hormone (LH), prolactin (PRL), follicle stimulating hormone (FSH), progesterone (PROG), estradiol (E<sub>2</sub>) changes were detected before and 3 months, 6 months, 12 months after UAE. **Results:** Three months, 6 months, 12 months after UAE surgery, all patients were followed up for 3 months. The volume of uterus and tumor volume were significantly reduced, and the degree of reduction was more significant ( $P < 0.05$ ); There were no significant differences in UAE, PRL, PROG, FSH, E<sub>2</sub>, LH, UAE, UAE 6 months, 12 months after treatment ( $P > 0.05$ ). **Conclusions:** UAE has definite efficacy, and it has little effect on ovarian function.

## 1. Introduction

Uterine leiomyoma is the most common in women of childbearing age, reproductive system benign tumor, the incidence rate was 20%-40%, about 40% of patients with uterine abnormal bleeding, and bleeding and tumor location and size no inevitable relation between the, clinical polygenetic menstrual amount or not, distribution of myomectomy. But after the operation still can not solve the abnormal bleeding symptoms that patients with uterine fibroids uterine abnormal bleeding and endometrial micro environment is related to the change of [1,2]. The clinical manifestations of uterine fibroids symptoms increased menstruation, extended cycle, lower abdomen and lumbosacral discomfort, anemia and other symptoms, drug therapy is difficult to achieve a satisfactory therapeutic effect,

traditional surgery traumatic big, after removal of the uterus caused absence of female reproductive organs, lead to endocrine disorders and to retain fertility of women is not suitable for, so it needs to choose can retain the uterus and can achieve the therapeutic effect of the method [3]. Ravina *et al* [4] in 1995 reported that uterine arterial embolization (UAE) was successful in treating uterine fibroids. After many years of development, UAE has become one of the important methods for the treatment of symptomatic uterine fibroids, and it retains the fertility function, but it has a certain effect on the ovarian function of the [5]. The clinical data of patients with symptomatic uterine fibroids treated with UAE from August 2015 to August 2014 were retrospectively analyzed.

## 2. Materials and methods

### 2.1. General information

The clinical data of 20 patients with symptomatic uterine fibroids treated by UAE in our hospital from August 2015 to August 2014

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Fund Project: Zhangjiakou science and technology project (number: 1421104D).

were retrospectively analyzed. All patients were consistent with the diagnostic criteria of uterine fibroids. The diagnosis was confirmed by B ultrasound and CT, and was associated with the changes of the menstrual cycle and irregular menstruation. Age 22 to 48 years old, average (36.2±5.2) years old, the course of disease was 5 to 12 years, the average (3.6±0.6) years; 3 cases of muscular wall myoma, 2 cases of submucosal myoma, 3 cases of mixed type myoma, 0.5 cases of mixed type, 6 cases of multiple myoma, 14 cases of single myoma; The diameter of myoma and 11 cases of >3 cm, 9 cases of less than 3 cm.

The other 30 cases of healthy physical examination of the aged women as the control group, aged 47 to 36.7 years old, average (22±4.8) years old. In the two groups, the patients with severe heart, liver, kidney disease, and no malignant tumor were excluded. The subjects were informed and agreed that there was no significant difference in age between the two groups ( $P>0.05$ ).

## 2.2. Method

Seldinger technique was used to puncture the right femoral artery, femoral artery catheter sheath, bilateral internal iliac artery angiography, arterial blood flow and blood flow, and the blood supply of the uterine artery was blocked.

## 2.3. Observation index

The image examination of symptomatic uterine fibroids was performed before and 3 months, 6 months, 12 months after UAE. Uterine volume and fibroid volume change was detected; luteinizing hormone (LH), prolactin prime (PRL), promoting stimulating bowel hormone (FSH), progesterone (PROG), estradiol ( $E_2$ ) changes were observed.

**Table 2**

Effects of UAE on ovarian function before and after operation.

Groups	LH (mIU/mL)	PRL (ng/mL)	FSH (MIU/mL)	PROG (nmol/L)	$E_2$ (pmol/L)
Control group	7.68±3.55	13.51±7.01	7.75±3.52	4.71±4.15	339.28±94.11*
UAE	7.68±2.78*	14.14±9.46*	7.64±3.44*	5.77±5.51*	340.45±95.72*
3 months after UAE	8.11±3.56 <sup>#</sup>	12.91±7.89 <sup>#</sup>	8.69±4.24 <sup>#</sup>	4.98±5.76 <sup>#</sup>	330.63±92.94 <sup>#</sup>
6 months after UAE	7.55±3.13 <sup>#</sup>	13.45±7.10 <sup>#</sup>	7.93±3.65 <sup>#</sup>	4.75±4.71 <sup>#</sup>	337.07±93.41 <sup>#</sup>
12 months after UAE	7.65±3.21 <sup>#</sup>	13.71±6.90 <sup>#</sup>	7.87±3.25 <sup>#</sup>	4.65±4.22 <sup>#</sup>	335.48±92.66 <sup>#</sup>

Note: compared with the control group, \* $P>0.05$ ; compared with UAE, <sup>#</sup> $P>0.05$ .

## 4. Discussion

Uterine leiomyoma is a benign tumor of reproductive system in women of childbearing age, menstrual changes are common symptoms, severe symptoms of abdominal pain and oppression, conservative treatment and more use of mifepristone and other hormone drugs, can inhibit the tumor volume and can not reduce the number of long-term use of certain adverse reactions, and the recurrence rate is relatively high[6]. Hysterectomy is a thorough treatment of uterine fibroids, due to surgical trauma, and can not save the ability to fertility, not by the majority of patients[7]. The uterus is

## 2.4. Statistical analysis

Measurement data were expressed as mean±SD, *t* test was used for analysis. Count data was analyzed by using  $\chi^2$  test.  $P<0.05$  was considered as statistically significant difference.

## 3. Result

### 3.1. Changes of uterine and myoma before and after UAE operation

At 3 months, 6 months, 12 months and months after operation, the patients were followed up for months. The volume of uterus and tumor volume was significantly reduced, and the degree of reduction was more significantly with the time of UAE ( $P<0.05$ ) (Table 1).

**Table 1**

Changes of uterine and myoma before and after UAE operation (cm<sup>3</sup>).

Time	Uterine size	Myoma size
UAE	475.6±38.4	143.5±24.1
3 months after UAE	321.7±28.1*	73.5±14.6*
6 months after UAE	255.3±30.7 <sup>#</sup>	58.6±8.8 <sup>#</sup>
12 months after UAE	157.3±22.5 <sup>#</sup> Δ	37.7±10.4 <sup>#</sup> Δ

Compared with UAE, \* $P<0.05$  and UAE; after 3 months, <sup>#</sup> $P<0.05$ ; and 6 months after UAE, Delta  $P<0.05$ .

### 3.2. Effect of UAE on ovarian function before and after operation

The levels of, PRL, PROG, FSH, LH ( $P>0.05$ ), UAE, and  $E_2$  were not significantly changed before and 3 months, 6 months and 12 months after operation. No difference was statistically significant (UAE), compared with the control group ( $P>0.05$ ) (Table 2).

an important reproductive organ for female, and it is also the target organ of the ovary, which has certain endocrine function. Therefore, the treatment method of the clinical reservation of uterus is getting more and more attention[8].

UAE was first used in the treatment of gynecological and obstetrics acute hemorrhage, vascular malformations, gynecological tumors, Ravina and other[4] first reported UAE reduction of uterine bleeding in patients with bleeding, bleeding symptoms, tumor volume reduction, and even clinical recovery cases, and then the clinical use of UAE treatment of uterine fibroids, and achieved good results. Vessels were enlarged, but no other collateral vessels and arteries, the arteries and veins, arteries and veins, arteries and veins,

can be obtained by the collateral vessels of the arteries. The arteries and veins of the uterus can be obtained. The collateral vessels can be obtained. The collateral vessels can also be obtained. The vessels can also be maintained. The vessels can be obtained from the vessels. The arteries and veins of the uterus can be obtained. The vessels can be obtained. Further, we can maintain the normal function. Other can preserve the normal function. Further more, we can maintain the normal function. Other can preserve the normal function. Other UAE can preserve the normal function. Other two vessels can provide. The uterus and ovary Constant physiological function, to avoid the physiological and psychological trauma caused by[9-11]. The results showed that, after 3 months, 6 months, 12 months, months after the follow-up, the uterus and tumor volume were reduced, and the UAE time was prolonged, the degree of reduction was more obvious, the difference was statistically significant ( $P < 0.05$ ), the UAE treatment of symptomatic uterine fibroids is more positive.

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Uterine artery ovarian branch originated from the uterine artery, 32% to 40% of patients with uterine fibroids in the uterine ovarian vascular anastomosis, ovarian blood supply to uterine artery ovarian artery from 70% to 3.9%, 50% patients with uterine fibroids by ovarian artery blood supply, so in the UAE treatment of uterine fibroids have a effect on the ovarian [12,13]. Uterine artery is tortuous slender, in embolism even if the application micro catheter technique is nearly impossible to completely avoid, in the UAE, particulate embolization may through the uterine artery and ovarian artery anastomosis branches into the ovarian artery and error embolism caused by ovarian failure[14]. The study showed that the operation of hysterectomy, bilateral uterine artery, retained the bilateral ovary, but the operation cut off from the uterus to ovarian blood supply, 15% postoperative ovarian failure, UAE on bilateral uterine artery embolization, resulting in a reduction in ovarian blood flow, ovarian artery blood flow through the collateral circulation of the uterus, thereby reducing the ovarian blood perfusion[16]. Some scholars believe that, after UAE, the blood supply of the uterus can quickly generate collateral circulation, the uterine artery embolization of uterine artery, ovarian artery also appear compensatory blood supply, so UAE will not affect the ovarian blood circulation and function[16]. The results showed that there was no significant difference in UAE, PRL, FSH, PROG, LH, E<sub>2</sub>,  $P > 0.05$ , 3 months, 12 months, 6 months after UAE. No significant difference was compared with the control group ( $P > 0.05$ ). The results showed that UAE had no significant effect on the treatment of symptomatic uterine fibroids.

UAE treatment of uterine fibroids trauma is small, the curative effect is exact, while preserving the uterus and ovary, ovarian function is small, is a better treatment of uterine fibroids, but the long-term efficacy of the treatment of myoma and ovarian function still need further research.

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