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CLINICAL ARTICLE

Etiology, treatment, and reproductive prognosis of women with moderate-to-severe intrauterine adhesions



Songshu Xiao, Yajun Wan, Min Xue*, Xiangyang Zeng, Fang Xiao, Dabao Xu, Xi Yang, Pu Zhang, Wen Sheng, Junlei Xu, Sai Zhou

Department of Obstetrics and Gynecology, Third Xiangya Hospital, Central South University, Changsha, China

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ABSTRACT

Objective: To analyze data from the hysteroscopic adhesiolysis of moderate-to-severe intrauterine adhesions (IUAs), and to review the disease etiology, changes in menstruation, uterine recovery, and reproductive prognosis of women after comprehensive therapy. **Methods:** In a retrospective descriptive analysis, clinical data were assessed from 683 patients with moderate-to-severe IUAs who were treated by hysteroscopic adhesiolysis at Third Xiangya Hospital, Changsha, China, between January 2007 and December 2011. Patients underwent comprehensive treatment. After hysteroscopic adhesiolysis, a persistent balloon urinary catheter was inserted, together with an intrauterine device (IUD). Intrauterine sodium hyaluronate gel was injected to prevent adhesion reformation, and oral estrogen was administered to promote endometrial regeneration. The outcomes were menstrual changes and uterine recovery under hysteroscopy, and the reproductive prognosis of patients with fertility intentions. **Results:** At the 3-month follow-up, the postoperative recovery of uterine shape was better than the recovery of menstruation among patients with moderate-to-severe IUAs. Among the 475 patients with fertility intentions, the pregnancy and live birth rates were 66.1% (314/475) and 64.0% (201/314), respectively. **Conclusion:** Comprehensive treatment prevented the recurrence of IUAs to a certain extent, but some severe endometrial injuries were found to be irreparable, reducing the rate of subsequent pregnancy and live birth. © 2014 International Federation of Gynecology and Obstetrics. Published by Elsevier Ireland Ltd. All rights reserved.

1. Introduction

Intrauterine adhesions (IUAs) refer to damage to the basal layer of the endometrium caused by various reasons [1,2], which leads to adhesions between the uterine walls and results in clinical manifestations such as reduced volume of menstrual fluid, amenorrhea, abdominal pain, infertility, habitual abortion, premature delivery, and abnormal placenta implantation [3]. The treatment for IUAs includes adhesiolysis, coupled with preventing the postoperative occurrence of new adhesions. For patients with moderate-to-severe IUAs or adhesions in the uterine horn, however, adhesion reformation after hysteroscopic adhesiolysis has a high incidence and is difficult to treat.

The aim of the present study was to analyze the outcome among patients with moderate-to-severe IUAs who were treated by hysteroscopic adhesiolysis. The outcomes assessed at 3 months after surgery included changes in menstrual volume and uterine recovery under hysteroscopy, in addition to the reproductive prognosis of patients with fertility intentions.

2. Materials and methods

In a retrospective study, data were reviewed from women who were treated by hysteroscopy adhesiolysis at the Third Xiangya Hospital of Central South University, Changsha, China, between January 1, 2007, and December 31, 2011. The study was approved by the Ethics Committee of the Third Xiangya Hospital, Central South University, Changsha, China. Informed consent for the procedure was obtained from all patients.

The present study included patients who had been diagnosed with moderate or severe (stage II–III) IUAs by hysteroscopy in accordance with the American Fertility Society (AFS) classification of intrauterine adhesions [4]. Women who were pregnant or had amenorrhea induced by ovarian and hypothalamus–pituitary lesions were excluded.

Hysteroscopy was carried out 3–7 days after the completion of menstrual bleeding, or 10 days after stopping the administration of a drug to induce artificial periods among patients with amenorrhea. Routine preoperative preparation was performed by 2 doses of rectal misoprostol (400 µg) administered the night before and 2 hours before the operation. Patients had fasted on the morning of surgery, and underwent general anesthesia by intravenous injection of propofol. The surgical hysteroscope (4.5-mm, 6.5-mm, or 8-mm) was from Olympus (Tokyo, Japan) and Karl Storz (Tuttlingen, Germany). The optical system and

* Corresponding author at: Department of Obstetrics and Gynecology, Third Xiangya Hospital, Central South University, Changsha 410013, China. Tel.: +86 137 8741 2954, +86 731 8861 8821; fax: +86 731 8861 8022.

E-mail address: 287932636@qq.com (M. Xue).

automatic uterine dilator were from Olympus. The uterine distention fluid was 5% mannitol, which was applied via a pump at a distention pressure of 100–120 mm Hg and a flow rate of 300–440 mL/min.

On the basis of the severity of the IUA, patients underwent different therapeutic measures. Intraoperative hysteroscopic sharp dissection with micro-scissors was performed as much as possible. After the cervix was dilated with a number 7 Hegar dilator, a 6.5-mm therapeutic hysteroscope was inserted and, under B-ultrasound monitoring, micro-scissors were introduced through the operative port of the hysteroscope. The adhesiolysis was started from the center of the uterine cavity, and extended to the fundus, bilateral walls of the uterus, and the uterine horns in order to expand the uterine cavity. The sign of complete adhesiolysis was the recovery of the uterine cavity back to normal size and morphology, with clearly visible bilateral uterine horns or ostia of the fallopian tubes. For hypertrophic dense fibromuscular adhesions, adhesiolysis was carried out with an 8-mm hysteroscopy system (resecto-hysteroscope, Olympus, Japan) [5], and monopolar/bipolar dissection needle-shape electrodes. The cutting and coagulating power were both set at 20–25 W and monopolar electrodes were used to avoid damage to the residual endometrium.

An IUD was inserted postoperatively [6–8], and its correct position was checked via the hysteroscope. Where necessary, the position of the IUD was adjusted via special clamps under the hysteroscope. After confirming that the IUD was positioned correctly, a bi-channel 12 Foley catheter balloon (with the catheter portion on the top removed) [9] was inserted and filled with 3–4 mL of saline, and 2 mL of sodium hyaluronate gel [10] was injected. The end of the catheter was then knotted and wrapped with sterile gauze to prevent any outflow. Prophylactic antibiotics (1.0 g of intravenous cefoxitin in 100 mL of saline) were given to all women.

After surgery, the patients were given oral estrogen to promote reparative proliferation of the endometrium [11]. According to the severity of the IUAs, some patients received continuous estrogen therapy; that is, estradiol valerate (3–4 mg, twice a day) for 3 months plus progesterone capsules (0.2 g per day) in the last 5–6 days. Other patients received estrogen and progesterone cycle therapy: that is, estradiol valerate (2–4 mg twice a day) for 21 days plus progesterone capsules (0.2 g per day) in the last 5–6 days for 3 months. Between 24 and 48 hours after surgery, the balloon catheter was connected to a drainage bag to drain the hematometra and inflammatory exudate. The Foley catheter was removed 3–5 days after surgery.

At the 3-month follow-up, women were assessed for postoperative changes in the volume of menstrual fluid and underwent a review hysteroscopy to observe the recovery of uterine cavity shape and the status of adhesion reformation. Depending on the results, the IUD was removed or revision surgery was performed for those patients with adhesion reformations. The amount of oral estrogen was also adjusted in accordance with the recovery of menstruation. Patients with fertility intentions were instructed to achieve pregnancy or underwent assisted reproductive technology, and their reproductive prognosis was subsequently followed up.

The effectiveness of the treatment was categorized as follows [12]. Cured: the volume of menstrual fluid was back to normal; the uterine cavity showed normal morphology and a smooth endometrial surface; and bilateral uterine horns and ostia of the fallopian tubes were clearly visible. Improved: the volume of menstrual fluid was increased; the morphology of the uterine cavity was essentially normal, but partial adhesions remained; and unilateral or bilateral uterine horns were invisible under hysteroscopic examination. Ineffective: there were no changes in the volume of menstrual fluid, or in the hysteroscopic morphology of the uterine cavity before and after adhesiolysis.

Statistical analysis was performed using SPSS version 17.0 (IBM, Armonk, NY, USA). Clinical data were reported descriptively as mean \pm SD, number, or percentage of women. The treatment was considered effective for cured and improved cases. Measurement data were compared via *t* test, *P* < 0.05 was taken to be statistically significant.

3. Results

During the review period, 9295 patients underwent hysteroscopy and 3417 (36.8%) underwent hysteroscopic adhesiolysis. After the exclusion of patients with mild IUAs and those lost to follow-up, 683 women with moderate-to-severe IUAs and a complete medical history were included in the study. These women were aged 18–45 years (mean \pm SD, 29.2 \pm 4.7 years) and accounted for 20.0% of the total number of IUA cases during the study period.

Among the 683 women, 465 had moderate IUAs and 218 had severe IUAs. In total, 644 women had a history of uterine operation, including 163 women with 1, 184 women with 2, 113 women with 3, and 223 women with 4 or more previous uterine operations.

The main reasons for the hospital referral were infertility and menstrual abnormalities. Overall, there was 240 cases of infertility (35.1%) and 406 cases of menstrual abnormalities (59.4%); the latter included 196 cases of amenorrhea (28.7%), 210 cases of hypomenorrhea (30.7%), and 26 cases of habitual abortion (3.8%). In addition, 37 women (5.4%) had periodic abdominal pains, most of which were associated symptoms of infertility and menstrual abnormalities, and 19 women had other rare clinical manifestations such as irregular vaginal bleeding or were without evident clinical symptoms (the reasons for the hospital referral were repetitive).

Post-abortion IUAs accounted for the largest portion of the 683 cases of moderate-to-severe IUAs (57.8%), followed by post-curettage IUAs caused by various pregnancy-related factors (25.3%). In addition, IUAs due to endometrial tuberculosis and the removal of IUDs accounted for 5.7% and 4.4%, respectively, of the moderate-to-severe IUAs (Table 1).

All of the 683 patients completed hysteroscopic adhesiolysis: 144 women (21.1%) underwent adhesiolysis once; 199 women (29.1%) twice; 179 women (26.2%) 3 times; and, among 161 women (23.6%) who underwent adhesiolysis more than 3 times, 7 patients underwent

Table 1
Etiology of 683 study patients with moderate-to-severe intrauterine adhesions.

Etiologic feature	Number (%) of women
Artificial abortion	395 (57.8)
Curettage	173 (25.3)
Insufficient drug abortion	51 (7.5)
Missed abortion	57 (8.3)
Postpartum/after labor induction	22 (3.2)
Spontaneous abortion	17 (2.5)
Embryos stopped growing post IVF-ET	7 (1.0)
Hysteroscopic curettage	8 (1.2)
Retained placenta	6 (0.9)
Uterine horn pregnancy	3 (0.4)
Cervical pregnancy	1 (0.1)
Hydatidiform mole	1 (0.1)
Endometrial tuberculosis	39 (5.7)
IUD removal	30 (4.4)
Delivery with curettage	13 (1.9)
Diagnostic curettage	7 (1.0)
Post uterine fibroid removal or self-clotting cutter treatment	7 (1.0)
Others	19 (2.8)
Postpartum	3 (0.4)
Drug abortion	2 (0.3)
Hysteroscopic tubal cannulation	2 (0.3)
Uterine septum electrosurgery	3 (0.4)
Hysterosalpingography	3 (0.4)
Cervical fibroid removal	1 (0.1)
Manual removal of the placenta	2 (0.3)
Post LEEP	1 (0.1)
Placental abruption	1 (0.1)
IUD placement	1 (0.1)
Total	683 (100.0)

Abbreviations: IVF-ET, in vitro fertilization embryo transfer; LEEP, loop electrical excision procedure; IUD, intrauterine device.

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