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Short Communication

Comprehensive treatment for infertile women with severe Asherman syndrome

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ABSTRACT

Objective: Many preoperative, intraoperative, and postoperative methods have been described that improve the outcomes of women with severe Asherman syndrome, and it is likely that an integrated application of all of these methods may provide better reproductive outcomes; however, there is as yet no report on this type of integrated approach.

Materials and methods: The cases of four infertile women with severe Asherman syndrome were analyzed retrospectively. The comprehensive therapeutic plan for the four women included (1) preoperative office hysteroscopy to confirm the diagnosis and evaluate the severity of disease; (2) the use of ultrasound-guided intraoperative abdominal procedures during the surgical procedure, including hysteroscopic adhesiolysis to ensure the entire the hysteroscopic dissection, and placement of a Hyalo-barrier[®] gel and an intrauterine balloon catheter at the end of the surgery; (3) postoperative oral estrogen supplementation to enhance endometrial proliferation, removal of the balloon catheter, and a second-look office hysteroscopy; and (4) *in vitro* fertilization and embryo transfer (IVF & ET) for three of the four patients.

Result: After treatment, the endometrium was significantly thicker than at baseline (median endometrial thickness, 7.5 mm versus 3.0 mm, $p < 0.05$). All the women (100%, 4/4) conceived successfully (three undergoing IVF & ET, and one had a spontaneous pregnancy), but only two patients had a term pregnancy with cesarean section (one placenta previa and the other placental abruption), contributing to 50% of successful term pregnancies. One patient had the complication of abortion after amniocentesis. The last one woman underwent an abortion because of thyroid problems.

Conclusion: Comprehensive management offers promising reproductive outcomes for infertile women with severe Asherman syndrome.

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Introduction

Asherman syndrome is a consequence of trauma to the endometrium, producing partial or complete obliteration in the uterine cavity and/or the cervical canal, resulting in conditions such as menstrual abnormalities, infertility, and recurrent pregnancy loss [1]. Although trauma to a gravid uterine cavity is known to be the main cause of

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Table 1
Patients with severe-type Asherman syndrome and outcomes.

Patient	Age (y)	D & C history	TCR history	Infertility	Other infertility factors	EM thickness (Pre Tx/Post Tx)	Pregnancy outcome
1	36	D & C × 2	No	SI for 2 y	Endometriosis, tubal occlusion	3.0/8.0 mm	18 wk, PPROM, abortion
2	36	D & C × 3	Yes (once)	SI for 1 y; AIH × 1	Adenomyosis	2.0/7.0 mm	38 wk, placenta previa, CS
3	35	D & C × 2	No	SI for 1 y	Tubal occlusion	4.0/9.0 mm	38 wk, placenta abruption, CS
4	38	D & C × 3	No	SI for 1 y	Ovulation dysfunction	3.0/6.0 mm	8 wk, spontaneous abortion ^a

AIH = artificial insemination by husband; CS = cesarean section; D & C = dilatation and curettage; EM = endometrium; PPROM = preterm premature rupture of membranes; SI = secondary infertility; TCR = transcervical resection; Tx = treatment; wk = gestational age in weeks.

^a The reason was secondary to thyroid disease.

Asherman syndrome, any uterine surgery can lead to Asherman syndrome [1]. Many preoperative, intraoperative, and postoperative methods have been described that improve the surgical outcomes of women with severe Asherman syndrome. These methods include direct inspection with hysteroscopy to accurately confirm the diagnosis and disease severity [2], transvaginal ultrasound (TVS) to assess the preoperative prognosis [3], laparoscopy-guided or transabdominal ultrasound (TAS)-directed hysteroscopic lysis of the synechiae [4], placement of physical barriers into the uterine cavity [5,6], second-look office hysteroscopy [7,8], estrogen supplementation to enhance endometrial proliferation, [9] and agents to increase vascular flow to the endometrium [10].

The integrated application of all of these methods may lead to better reproductive outcomes, but no reports on this approach are available so far. In the current study, we report our experience and the reproductive outcomes using these combined procedures—a comprehensive preoperative, intraoperative, and postoperative approach for infertile women with severe Asherman syndrome.

Materials and methods

A complete retrospective chart review was performed to identify infertile women who underwent comprehensive treatment of severe Asherman syndrome by one surgeon (Dr Tsui) at the Reproductive Center in Kaohsiung Veterans General Hospital from 2011 through 2012. The diagnosis of severe-type Asherman syndrome (scores 9–12) was confirmed by preoperative hysteroscopy, in accordance with the American Fertility Society (AFS) Classification of Uterine Adhesions [11]. Baseline endometrial thickness, pelvic anatomy, and cause of infertility were evaluated by TVS and laboratory examination [12].

All intraoperative procedures were guided by TAS with adequate distension of the urinary bladder, including hysteroscopic adhesiolysis, adhesion prevention, and intrauterine balloon positioning. TAS-guided hysteroscopic adhesiolysis included a well-distended urinary bladder, adequate and delicate dilation of the cervical canal and endometrial cavity, and hysteroscopic lysis of an intra-uterine adhesion by hysteroscopy scissors and a bipolar electrode using a controlled flow pump with normal saline for distention. A one-step procedure to restore the normal dimension of the uterine cavity was performed for all patients.

At the end of the hysteroscopic adhesiolysis, a Hyalobarrier gel and a triangular intrauterine balloon catheter (Cook Medical) [13] were placed and inflated at the uterine fundus under abdominal ultrasound guidance. The balloon catheter was removed one week after surgery.

A second-look office hysteroscopy was performed within 2 weeks after surgery, and estrogen supplementation (estradiol acetate 2 mg, twice per day) was provided for 8 to 10 weeks after the office hysteroscopy. Postoperative TVS was used to evaluate endometrial thickness after estrogen supplementation. *In vitro* fertilization and embryo transfer (IVF & ET) were performed when endometrial thickness had reached 6 mm at least. If posttreatment

endometrial thickness did not reach 6 mm at least, combined estrogen and agents to increase vascular flow to the endometrium (e.g., vitamin E, L-arginine, sildenafil citrate) were administered until the desired endometrial thickness was attained [10]. Response to treatment was determined by subsequent achievement of pregnancy and live birth (Table 1).

Results

The ages of the patients ranged from 35–38 years. All women had undergone dilation and curettage at least twice after pregnancy and Patient 2 underwent previous hysteroscopic surgery. All the women had amenorrhea and secondary infertility caused by Asherman syndrome. A comprehensive therapeutic plan, including preoperative evaluation, and intraoperative as well as postoperative management, was applied with all four patients (Table 2). During the surgical procedure, no uterine perforation occurred. After treatment, the endometrium was significantly thicker than at baseline (median endometrial thickness, 7.5 mm versus 3.0 mm, $p < 0.05$). All the women conceived successfully (three undergoing IVF & ET, and one had a spontaneous pregnancy), but only two patients had a term pregnancy with cesarean section (one placenta previa and the other placental abruption). Three of the four patients underwent amniocentesis because of the indication of advanced maternal age [14,15]; however, one patient had the complication of abortion after amniocentesis. The last patient underwent abortion because of thyroid problems.

Discussion

A comprehensive approach to infertile women with Asherman syndrome, including accurate diagnosis, elaborate surgery, methods to reduce adhesion reformation, active assisted reproductive technology, and ongoing surveillance of pregnancies up to delivery, has been demonstrated to optimize outcomes.

Table 2
Comprehensive management of severe Asherman syndrome.

Preoperative
Transvaginal ultrasound (TVS) to assess baseline endometrial thickness and evaluate pelvic anatomy
Office hysteroscopy to confirm diagnosis and identify extent of adhesions
Intraoperative
Transabdominal ultrasound (TAS)-guided cervical and uterine dilatation
TAS-guided adhesiolysis of uterine synechiae
TAS-guided insertion of Hyalobarrier gel into uterine cavity
TAS-guided placement of intrauterine balloon catheter
Postoperative
Remove intrauterine balloon catheter 1 wk after surgery
Office hysteroscopy within 2 wk after surgery
Estrogen supplementation for 8–10 wk after office hysteroscopy
TVS to assess posttreatment endometrial thickness
Active assisted-reproductive technique, including <i>in vitro</i> fertilization and embryo transfer if endometrial thickness ≥ 6 mm

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