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Hysteroscopic Appearance of Endometrial Cavity after Microwave Endometrial Ablation

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ABSTRACT **Study Objective:** To assess the appearance of the endometrial cavity after microwave endometrial ablation.
Design: Prospective observational study.
Setting: GuangDong Women's and Children's Hospital, GuangDong, China.
Patients: A total of 349 patients who underwent microwave endometrial ablation from January 2000 through August 2008 were followed up for 1 month to 8 years. At follow-up in 2007 and 2008, patients were advised of this clinical study and were randomly selected for participation if they agreed to undergo outpatient hysteroscopy to assess the uterine cavity during follow-up visits. Fifty three patients (median [range] age, 43.1 [33–53] years) were recruited into the study at the time of endometrial ablation.
Intervention: Outpatient hysteroscopy.
Main Results: Within the first 3 months after ablation, outpatient hysteroscopy revealed varying amounts of necrotic tissue from the endometrium and superficial myometrium of the uterus. Six months postablation, a granulomatous reaction and fibrosis were present. A fibrotic cavity was also evident, and menstrual flow was reduced or had ceased. One year after ablation, hysteroscopy demonstrated a fibrotic cavity with myofibrous scars. Most patients developed amenorrhea at this time. Two years or more postablation, a second hysteroscopy demonstrated various types of intrauterine adhesions in 28 of the 53 women (52.8%). A cervical adhesion was observed in 1 patient (1.9%), focal adhesions in the fundal area in 12 (22.6%), a narrowed and scarred uterine cavity with bilateral stenotic tubal ostia in 11 (20.7%), and complete obliteration of the cavity in 4 (7.5%). Of these 28 women, 22 had amenorrhea, 3 had vaginal spotting during menstruation, and 2 had hypomenorrhea. Of those without intrauterine adhesions, only 5 had amenorrhea, 10 had vaginal spotting, and 8 had hypomenorrhea.
Conclusion: The hysteroscopic appearance of the uterine cavity after microwave endometrial ablation varies considerably. In this study, the menstrual outcome was correlated with postablation uterine cavity appearance. Journal of Minimally Invasive Gynecology (2010) 17, 30–36 © 2010 AAGL. All rights reserved.

Keywords: Hysteroscopy; Intrauterine adhesions; Microwave endometrial ablation

Microwave endometrial ablation (MEA; Microsulis Medical, Ltd., Denmead, Hampshire, England) is a second-generation endometrial ablation technique that was first used in the early 1990s [1]. It is a software-controlled device designed to destroy the endometrial lining of the uterus using microwave energy at a fixed frequency of 9.2 GHz. The objective of this unique type of endometrial ablation is to destroy the basal layer of the endometrium and endometrial glands. The endometrium then undergoes coagulation necrosis, degeneration, and fibrosis, resulting in a therapeutic Asherman syndrome to alleviate menstrual symptoms. Microwave endometrial ablation has proved to be a safe, effective, and less invasive alternative to hysterectomy in management of menorrhagia due to benign causes. The short-term success rates have been extremely encouraging; long-term follow-up has, however, identified certain unique complications. One such problem was that the endometrial cavity may become markedly reduced to a narrowed tube as a result of fibrosis and contracture. If this scarring and contracture occurs at the lower end of

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Table 1
Relationship between Menstrual Outcome and Hysteroscopic Appearance of Uterine Cavity after Ablation*

	No intrauterine adhesions				Intrauterine adhesions			
Menstrual Outcome	Varied necrosis	Normal cavity	Fibrotic cavity	Endometrial polyps	Hematometra in cavity	Focal adhesion	Narrowed uterus	Obliteration of cavity
Amenorrhea	1	0	4	0	0	10	9	3
Spotting	7	0	3	0	1	1	1	1
Hypomenorrhea	4	4	0	0	0	1	1	0
Eumenorrhea	0	1	0	1	0	0	0	0
Total	12	5	7	1	1	12	11	4

* Data represent number of patients.

the uterine cavity, it may cause hematometra, could potentially cause symptoms secondary to retained tissue and may delay the diagnosis of endometrial cancer. Many pilot studies have reported on aspects such as short-term effectiveness, early complications, and safety of MEA [2–5]. There have been few reports on the hysteroscopic appearance of the uterine cavity and the incidence of intrauterine adhesions after MEA. We have used MEA to treat menorrhagia since 2000, and offered our patients outpatient hysteroscopy to assess the uterine cavity after ablation at follow-up between 2007 and 2008. We recorded the hysteroscopic changes and correlated them with menstrual outcomes after treatment. The objectives of this study are to describe the appearance of the endometrial cavity after MEA, to show the value of second-look hysteroscopy, and to explore the possible correlation between hysteroscopic findings and menstrual outcome.

Patients and Methods

Patients

Between January 2000 and August 2008, 349 women underwent MEA using microwave energy at a fixed frequency of 9.2 GHz They had been followed up from 1 month to 8 years and were invited to undergo outpatient hysteroscopy for assessment of the uterine cavity. Fifty-three women (15.2%) agreed and underwent outpatient diagnostic hysteroscopy. The median (range) duration of postablation follow-up was 47 (1–96) months. Age at endometrial ablation was 43.1 (33–53) years. No patient included in the study was menopausal or perimenopausal.

Indication for MEA

Menorrhagia is defined as excessive menstrual flow resulting in iron-deficiency anemia and chronic weakness [6]. All patients had a Pictorial Blood Assessment Charts score of 100 or higher [7]. Women who had heavy menstrual loss with normal uterine histologic findings 6 months before ablation, with uterus size not greater than 10 weeks' gravid size or uterine cavity less than 12 cm, were recruited for this treatment. These women also failed to respond to any medical treatment and agreed to not pursue fertility after ablation.

MEA Procedure

Six of 53 patients were given 3.6 mg goserelin (n = 3) or danazol (n = 3) to achieve endometrial thinning 4 weeks before the MEA procedure. Participants underwent ultrasound examination to measure endometrial thickness. If it was greater than 5 mm, a diagnostic hysteroscopy was performed before MEA to exclude any intrauterine lesion in the endometrial cavity. The MEA procedure involved use of a microwave probe 8 mm in diameter inserted into the uterine cavity until its tip reached the uterine fundus. Once the temperature (visually displayed) reached 75°C, the probe was moved slowly from side to side, then slowly withdrawn from the uterine cavity while maintaining the temperature at 75°C to 80°C. The technique effectively ''paints'' microwave energy with a maximum penetration of 6 mm over the entire surface of the uterine cavity.

Diagnostic Hysteroscopic Procedure

Diagnostic hysteroscopy was performed with the patient under local anesthesia using intravenous sufentanil and with cervical dilation to 9 mm using 5% glucose as the distending medium. The presence of residual endometrium and intrauterine adhesions was noted, and their locations were recorded. Before hysteroscopy, the menstrual patterns of the women at follow-up were also recorded. The menstrual patterns were described as amenorrhea, spotting, hypomenorrhea (reduced flow, i.e., menstruation bleeding for < 3 days), and eumenorrhea (normal flow, i.e., menstruation bleeding for 3–7 days).

The study protocol was approved by the Clinical Research Ethics Subcommittee of Guangdong Women's and Children's Hospital, and written consent was obtained from each woman recruited into the study.

Results

Menstrual outcome relative to the hysteroscopic appearance of the uterine cavity after ablation is given in Table 1. The 2 types of hysteroscopic appearance after MEA are lack of intrauterine adhesions (including intrauterine necrosis, fibrotic cavity, normal cavity, and endometrial polyps) and presence of intrauterine adhesions of varying extent and severity.