The Safety and Efficacy of Microwave Endometrial Ablation After Endometrial Curettage without Hormonal Pretreatment

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SUMMARY

Objective: To evaluate the safety and efficacy of a microwave endometrial ablation (MEA) procedure to treat patients with menorrhagia after endometrial curettage but without medical pretreatment.

Materials and Methods: From February to September 2001, 19 eligible and consenting premenopausal women with menorrhagia underwent endometrial curettage, immediately followed by MEA. No medical pretreatment with gonadotropin-releasing hormone (GnRH) analogues or danazol was given for endometrial preparation. The severity of menorrhagia was assessed using the menstrual score. The patients were followed up for at least 3 years.

Results: Of the 19 women, 17 had completed at least 3 years' follow-up. Fourteen patients (82%) were satisfied with the posttreatment menstrual status, comparable with those patients receiving medical pretreatment of other studies (78–94%). The mean menstrual score was 11.8 before treatment and 1.95, 2.25, 2.2, 2.1 and 2.1 at 3, 6, 12, 24 and 36 months posttreatment, respectively. Of the 12 patients who complained of dysmenorrhea before surgery, six (50%) showed improvement. Three patients had hysterectomy; they all had adenomyosis and dysmenorrhea which did not respond to medical analgesics.

Conclusion: MEA preceded by endometrial curettage instead of hormonal pretreatment had results comparable to those of other studies in which the patients received hormones for 4–6 weeks before MEA. Endometrial curettage is an alternative to drug pretreatment. [*Taiwan J Obstet Gynecol* 2007;46(2):152–156]

Key Words: endometrial curettage, menorrhagia, microwave endometrial ablation, pretreatment

Introduction

Menorrhagia is generally defined as excessive menstrual bleeding in the absence of organic pathology, where the blood loss in each menstrual cycle exceeds 80 mL [1]. In the United Kingdom, 10% of women have had a hysterectomy by the age of 43 years [2]. Of over 70,000 hysterectomies performed annually, more than half are for menorrhagia. In up to 30% of these patients, the uterus is found to be structurally normal and the diagnosis is dysfunctional uterine bleeding [3]. Hysterectomy is a major operation with well-documented complications. Therefore, gynecologists have continued to explore less radical methods for treating menorrhagia.

The treatment of menorrhagia in the 20th century changed after 1960 with the introduction of hormonal therapy, when a trial of cyclic therapy with estrogen and progesterone became a therapeutic option. For those intolerant of medical therapy and for whom fertility was no longer desired, hysterectomy, however, had remained the standard treatment for intractable menorrhagia. More recently, a number of endometrial ablation techniques have emerged. Goldrath et al [4] pioneered endometrial laser ablation in 1981, with a study by

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Davis in Glasgow in 1985 confirming its efficacy [5]. Magos et al [6] introduced transcervical resection of the endometrium (TCRE) in Britain in 1989. TCRE is effective, but it is a difficult technique to learn and carries the risks of perforation and fluid overload.

To reduce the technical skill required to perform endometrial ablation as well as its risks and costs, several technologies of endometrial ablation have been developed, including cryotherapy, direct circulation of heated saline, laser interstitial therapy, radiofrequency hyperthermia and microwave. Most of them need preoperative medical suppression of the endometrium.

Endometrial thickness varies from 3 to 11 mm during the menstrual cycle. The aim of endometrial ablation is to destroy the basal layer of the endometrium and to prevent its regeneration. Microwave endometrial ablation (MEA) was demonstrated by Sharp et al [7] in 1995 to be a quick, safe and effective way to treat menorrhagia. It produces necrosis to a depth of 5 to 6 mm [8]. Therefore, it is necessary to ensure that the thickness of the endometrium is adequately reduced prior to MEA in order to achieve destruction of the basal layer. After endometrial sampling to exclude malignancy, Sharp et al [7] pretreated all his patients with one injection of goserelin acetate (Zoladex; Zeneca, Cheshire, UK) 3.6 mg, 4 weeks before MEA or danazol 800 mg daily for 4 weeks before the procedure. We chose to use endometrial curettage rather than hormonal pretreatment to reduce endometrial thickness. MEA was then performed immediately after curettage. We used this procedure in a series of patients to compare its safety and efficacy with that reported for MEA after hormonal pretreatment.

Materials and Methods

From February to September 2001, 19 eligible and consenting premenopausal women with menorrhagia underwent endometrial ablative surgery using equipment producing microwaves at a frequency of 9.2 GHz (Microsulis Plc, Waterlooville, Hampshire, UK). No hormones were given prior to surgery. Under intravenous general anesthesia with propofol, they were placed in the lithotomy position. The cervix was dilated to 8 mm and sharp endometrial curettage was performed. MEA was done immediately after curettage. The operative technique used was as described by Sharp et al in 1995 [7]. The patients were given ketoprofen (50 mg) for postoperative pain relief and cephalexin (500 mg) for 3 days. No preoperative antibiotics or analgesics were given. The severity of menorrhagia was assessed using the menstrual score (Table) as described by Sharp et al in 1995 [7]. Patients were followed up for at least 3 years. Questionnaires were completed at recruitment and at 3, 6, 12, 24 and 36 months of follow-up.

Table. Menstrual score chart*

	Score
Dysmenorrhea	2
Days of bleeding	
7–10	1
> 10	2
Average length of cycle	
If > 28	0
If 24–27	1
If < 24	2
Heavy days	
For each	1
Sanitary protection	
If double	2
Frequency of changing	
If > 2 hourly	1
If > 1 hourly	2
Clots	1
Flooding	1
Housebound or time off work	2
Preoperation	
Duration of problem > 5 yr	1
Postoperation	
Any menstrual loss	1

**From Sharp et al [7].*

Results

Of the 19 women, 17 patients completed at least 36 months of follow-up. The other two patients reported satisfaction at 3 months after the procedure but failed to return for their appointment at 6 months.

A mean patient age of the 19 patients was 43.2 years (range, 37–48 years), and the mean treatment time required for MEA was 197 seconds (range, 125–390 seconds). The mean length of uterine cavity was 8.5 cm. The mean menstrual score before treatment was 11.8 (range, 6–21), and it was 1.95, 2.25, 2.2, 2.1 and 2.1 at 3, 6, 12, 24 and 36 months, respectively. The satisfaction rate was 89.5% (17/19) in the first 3-month posttreatment follow-up. Two patients failed to return for the next 3-month appointment. Of the 17 patients followed up for at least 36 months, 14 (82%) were satisfied with the menstrual status after MEA. Two of the 19 (10.5%) were amenorrheic. Twelve patients complained of dysmenorrhea before surgery, six (50%) of whom had

improvement after MEA. This included the two women with amenorrhea. Three cases had hysterectomy because of dysmenorrhea and pathologic adenomyosis. No malignancy was found in any of the endometrial tissue samples.

Of the three dissatisfied patients, one had a decrease in menstrual flow but an increase in duration. This patient responded to hormone therapy. The second patient had progressive adenomyosis and persistent menorrhagia and dysmenorrhea. She underwent hysterectomy 7 months after MEA. The third patient had improvement of menorrhagia for 6 months but had an episode of massive vaginal bleeding requiring blood transfusion. The bleeding did not respond to hormone therapy or antifibrinolytic agents. Hysteroscopic evaluation disclosed an area of focal endometrial growth. We then performed roller-ball endometrial ablation, after which her bleeding stopped. She became amenorrheic after roller-ball ablation. There were two patients who had adenomyosis and were satisfied with the posttreatment hypomenorrhea status. But they cannot tolerate the dysmenorrhea and had hysterectomy at 3 years postoperatively.

Discussion

In 1995, Sharp et al [7] demonstrated that MEA was a quick, safe and effective way to treat menorrhagia. In a series of 23 patients, the average time needed for the procedure was 2 minutes and 2 seconds, and 83% of the patients were satisfied at 6 months after treatment. In his subsequent experience with over 300 patients, there were no intraoperative complications or uterine perforation. Only three patients were admitted for suspected endometritis. In another study of 1,364 cases using MEA, no emergency hysterectomies were necessary, compared with 11 out of 1,000 cases using TCRE [9]. Only one serious complication occurred in one patient (0.07%) who had had two previous cesarean sections and developed a small bowel defect after MEA. Minor complications included endometritis and blunt perforations by Hegar dilators (three cases) and applicators (one case). Other reports of complications included one case with small bowel perforation and one with pelvic abscess [10,11]. Little complications were reported, indicating that MEA is very safe when compared with other hysteroscopic techniques.

Our study demonstrated that using diagnostic endometrial curettage prior to MEA, rather than first giving hormones as pretreatment, also provided adequate thinning of the endometrium. It also provided endometrial tissue for pathologic analysis but did not require a separate procedure for that purpose. It was thus truly a "one-stop" method. There were no complications in the 19 patients we treated in this way. Of the 17 available for 36 months' follow-up, 82% (14/17) were satisfied with the results, comparable with those of other studies (78–94%) [8,9,12], as was the decrease in the menstrual score from 12 before to 2 after MEA. Dysmenorrhea improved in half of the patients who noted it prior to MEA. We did have a lower incidence of post-MEA amenorrhea ($n = 2$; 10.5%) than that reported by others. There was one report which compared the effect of MEA in the immediate postmenstrual phase without hormone preparation and that after hormonal preparation. The amenorrhea rates were 52% and 62%, respectively [13]. Our lower rate of amenorrhea may be due to inadequate endometrial curettage, such that the microwaves could not penetrate the basal layer in some areas. The presence of intrauterine blood clots after curettage may decrease the transmission of microwave energy. Pretreatment with hormones has a global effect on the endometrium, whereas curettage may miss some areas, especially in the cornual area. Also, a large and severely distorted uterine cavity is easy to be treated incompletely [14]. Whether we will continue to see such a low incidence of amenorrhea awaits assessment of larger numbers of patients.

In the third patient who was dissatisfied because of massive bleeding occurring 6 months after MEA, we performed hysteroscopy to evaluate the uterine cavity. There was normal endometrium still preserved in the cornual area, which we thought was the cause of treatment failure in this case. Sharp et al [7] also found that a significant number of patients had failure of MEA because of trapped endometrium in the cornual area.

This low rate of amenorrhea may, in fact, be an advantage in our population. Some Chinese women wish to avoid amenorrhea. They think of it as sign of aging, even after the situation has been carefully explained to them. Two patients returned, concerned about hypomenorrhea. They were satisfied with the resolution of their menorrhagia but were afraid that they were prematurely entering menopause, despite their hormone levels being normal. Amenorrhea certainly solves the problem of menorrhagia, but it may create new anxiety for some patients.

Three patients had hysterectomy eventually. Only one of them still had persisted heavy menstrual flow and the other two were satisfied with the posttreatment hypomenorrhea status. The most important reason for them to have hysterectomy was dysmenorrhea due to pathologic adenomyosis. The gross picture of the uterus (Figure) after MEA showed a linear endometrium only. The endometrium was destroyed by MEA 3 years before.

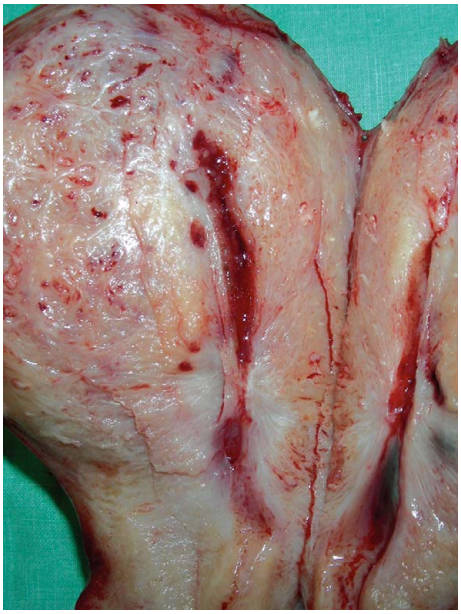

Figure. The uterus shows adenomyosis and a linear endometrium post-MEA treatment.

Before the MEA procedure, 12 patients had dysmenorrhea. Six had improvement after MEA. The reasons for the cure of dysmenorrhea may be that the microwave energy penetrated the endometrium to the nearby myometrium and destroyed the adenomyotic foci. So those patients who had large adenomyosis and severe dysmenorrhea should have had pretreatment consultation about the outcomes of MEA management.

Endometrial preparation is recommended in all ablation technologies except the NovaSure system [15]. Treatment with a GnRH analogue or danazol prior to hysteroscopic surgery has the following advantages: improved hysteroscopic view, reduced blood loss, absorption of fluid distending the uterus, and higher postoperative amenorrhea rates [16]. However, the cost of the medication is high, and at least 4 weeks of treatment are needed to achieve endometrial suppression. Mechanical preparation of the endometrium, therefore, seems to be a good alternative to medical preparation. Both Nd:YAG laser and thermal balloon technologies have been used successfully with results comparable to that using traditional medical preparation [17,18]. Endometrial curettage just prior to MEA thus saves time and money, as well as provides for detection of malignancy and enhancing patient compliance. Timing of the procedure is not dependent on the menstrual cycle.

MEA is simple to learn and perform. This was our first experience with the technique, which may explain why our average treatment time of 195 seconds was longer than that reported by others. The first five patients required an average of 297 seconds, when our learning curve was steep. Initially, we used ultrasound to confirm the position of the applicator, and we also used hysteroscopy to evaluate the effects of MEA in the first four patients. Visual inspection in these patients revealed destruction of the endometrium without perforation.

The reported incidence of complications with MEA has been very low. We had no major complications resulting from the procedure. Five patients, who complained of mild lower abdominal pain for 1 to 2 days, responded incompletely to NSAIDs (ketoprofen, 50 mg q 6 h), but it was tolerable. There were no cases of endometritis. All the patients had mild vaginal discharge lasting for about 2 to 3 weeks.

The results of this initial series are encouraging. We believe that substituting endometrial curettage for hormonal treatment is a reasonable alternative to achieving thinning of the endometrium prior to MEA, without compromising the results.

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