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ORIGINAL ARTICLE

Hysteroscopic Partial Endometrial Resection Versus Thermal Balloon Ablation for Treatment of Heavy Menstrual Bleeding in Premenopausal Women

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ABSTRACT

Background: For premenopausal women, heavy menstrual bleeding (HMB) is a serious health issue that can lower their quality of life and result in anemia. First-generation procedures like transcervical resection of the endometrium (TCRE) are regarded as the benchmark by which second-generation techniques like balloon, cryoablation, thermal laser, and bipolar electrode ablation are measured. Thermablate Endometrial Ablation System (EAS) is relatively new in the market.

Aim: To evaluate the short-term effects and sequelae of two conservative surgical approaches; hysteroscopic partial endometrial resection versus thermal balloon ablation for treatment of heavy menstrual bleeding (HMB) in premenopausal women.

Methods: This prospective randomized control trial was conducted on women who attended to Department of Obstetrics andGynecology of Zagazig University Hospital and Aga Hospital for treatment of premenopausal bleeding. Patients were divided into two groups: group (1): 31 women with heavy menstrual bleeding who were treated by hysteroscopic partial endometrial resection and group (2): 31 women with heavy menstrual bleeding who were treated by thermal balloon ablation.

Results: There was no statistical significance difference between two groups regarding unexpected bleeding and satisfaction. Hospital stay and time to normal activity in HPER group was significantly lower than TBA group.

Conclusion: TBA and hysteroscopy resection had similar success rate in women with menorrhagia . After a 6-month follow-up of treatment, there was no difference between the two groups' surgical success rate or satisfaction. Despite this, TBA is superior to HPER in terms of cost, length of hospital stay, and time needed to resume regular activities.
Keywords: Hysteroscopic Partial Endometrial Resection, Thermal Balloon Ablation, Menstrual Bleeding, Premenopausal.

INTRODUCTION

A menstrual cycle lasting between 21 and 35 days, with a flow lasting between 2 and 7 days, and a total blood loss of 30 to 80 milliliters in a single cycle are considered typical. Any additional bleeding is therefore categorized as abnormal uterine bleeding **[1].**

Any bleeding that does not fit within the typical parameters in terms of amount, frequency, duration, or cyclicity is referred to as AUB bleeding. Menorrhagia, polymenorrhoea, metrorrhagia, and

intermenstrual bleeding are the most frequent appearances**[2]**

Menstruation that is heavy but regular more than 80 milliliters every cycle is referred to as menorrhagia. Over 200 mL every cycle is considered severe menorrhagia. Reports of menorrhagia are frequent. In the UK, 5% of women between the ages of 30 and 49 see a general practitioner annually for menorrhagia; in New Zealand, menstruation issues account for 2-4% of primary care consultations for premenopausal women **[3].**

Endometrial ablation, a sophisticated and less invasive kind of hysteroscopic surgery, is a genuine substitute for hysterectomy. It allows patients to quickly return to their regular daily activities and is especially helpful for patients who are not responding to medical treatment or who are at high risk of major surgery **[4].**

Transcervical resection of the endometrial (TCRE) is a first-generation procedure that is widely used as a reference standard for second-generation techniques, including thermal laser, balloon, cryoablation, and bipolar electrode ablation. Because TCRE maintains the uterus, has fewer major side effects, and seems to be safer than hysterectomy, it is considered less invasive surgery **[5].**

However, a number of studies have revealed that up to 23% of women who have TCRE are referred for a hysterectomy within 25 years due to treatment failure, with 75% of these referrals occurring within the first five years following TCRE due to unsatisfactory outcomes. According to data from the Danish Hysterectomy Database, which was released in 2017, 23% of women had a hysterectomy or re-TCRE during the first five years after TCRE. The high rate could be explained, in part, by the tendency to ignore adenomyosis **[6].**

The surgical simplicity and effectiveness of the thermal balloon endometrial ablation (TBEA) procedure are contributing to its growing popularity. but usually reserved for normal uterine cavities. The stated success percentage varies between 79% and 91% with long-term patient satisfaction and overall, 11%, probability of proceeding to subsequent hysterectomy over 8 years **[7].**

Thermablate Endometrial Ablation System (EAS) is relatively new in the market and to the author's knowledge there are few papers in the literature on its efficacy and subsequent effects.

PATIENTS AND METHODS

This prospective randomized control trial was conducted on women who will attend to department of obstetrics andgynecology of Zagazig University Hospital and Aga Hospital for treatment of premenopausal bleeding from Jaunury 2022 to May 2023. Study protocol was submitted for approval by IRB 9162-13-12-2021. Informed consent was obtained from each participantsharing in the study.

Patients were divided into two groups: group (1): 31 women with heavy menstrual bleeding who were treated by hysteroscopic partial endometrial resection and group (2): 31 women with heavy menstrual bleeding who were treated by thermal balloon ablation.

Inclusion criteria included patients with symptomatic menorrhagia as demonstrated by pad counts and self-assessment of bleeding patterns, with excessive menstrual bleeding and no organic lesions in the uterus cavity, age ≥40, and unwilling or unable to continue with medical therapy with progestins.

Exclusion criteria included age < 40 years, those of reproductive age who want to maintain their fertility, fibroids, polyps, adenomyosis, premalignant lesions, uterine cavities longer than 12 cm, congenital and acquired uterine anomalies, breast cancer, malignant uterine diseases, and hematological problems.

All patients were subjected to full history taking, general examination, body mass index, blood pressure and pulse rate.

Pelvic ultrasonography and high resolution transvaginal ultrasonography was carried out. Diagnostic outpatient hysteroscopy was done. Every patient was given access to a baseline complete blood picture, ferritin, routine urine testing, blood sugar, blood grouping, coagulation and bleeding times, prothrombin times, liver and kidney functions, and an electrocardiogram.

The Pictorial Blood Loss Assessment Chart (PBAC), a semi-quantitative measuring instrument, was used to record menorrhagia. Women were told to split the amount of tampons or towels they used each day by level of soiling. The scoring system developed by Higham et al. is used to score the chart. Comparing this measuring method to the gold standard yields specificity and sensitivity of 80–90%. Alkaline hemostatin technique **[10].**

A PBAC score of 150 was utilized as a diagnostic tool to identify menorrhagia, and PBAC scores were also used to evaluate the outcomes of therapy groups. Menorrhagia was always confirmed by pictorial blood assessment chart (PBAC) values greater than 150 for the two months prior to randomization. A PBAC score of less than 75 indicated success in this study.

IV iron treatment was administrated for patients with severe anemia and a Hb level ≤ 9 gm/dL. Patients with hemoglobin levels below 7 gm/dl received blood transfusions.

All patients received a preoperative non-steroidal anti- inflammatory drug. All patients received a combination of amoxicillin and clavulanic acid (Augmentin, 1.0 g intravenously) as antibiotic prophylaxis after sensitivity test. The procedure was carried out under spinal anesthesia. Under the close supervision of the consultant gynecologist, all procedures were performed on all patients by a consultant gynecologist or a post-graduate trainee in obstetrics and gynecology (registrar or senior registrar).

Group 1: The bipolar resectoscope was inserted after the cervix had been dilated to Hegar 10. Saline 0.9% was used to assist dilate the uterus. To maintain a constant intrauterine pressure, the plastic bottle was wrapped in the pneumatic tourniquet's cuff and the pressure was increased to 100 mmHg. Using a cutting loop electrode, the endometrium was resected with a pure cutting current of 100 watts. Beginning with a partial excision of the endometrium, the posterior and lateral walls were methodically shaved down to the basal layer.

For group 2: The endometrial thermal induction treatment system consists of using the Foley catheter balloon as follows: dilatation of the cervix up to Hegar 10, then insertion of a catheter into the uterus and fill the catheter balloon with boiling saline. The amount of water that was injected into the balloon varies according to the capacity of the uterine cavity. On average, about 15 to 30 cm. We leave the water for 3 minutes, then withdrew it and replace it with a quantity represented by the boiling temperature. This process is done several times, and the total operation time is from 10 to 15 minutes, and at the last time we emptied the balloon and withdrew the catheter from the uterus **[11].**

Within 24 hours of surgery, all women were released, and they had reviews one, two, three, four, five, and six months later. Every visit included filling out a questionnaire, determining whether additional therapy was necessary, and discussing any procedure-related side effects. After 1, 3, and 6 months following surgery, a full blood picture, ferritin, and a regular urine study were assessed.

Statistical Analysis

SPSS 26.0 (SPSS Inc., Chicago, IL, USA) was used to gather, tabulate, and statistically analyze all of the data. Number and percent were used to describe quantitative data. The range (minimum and maximum), mean, standard deviation, and median were used to characterize the qualitative data. The independent T-test and the chi-square (X2) test were the tests that were employed.

RESULTS

Table (1) showed that there was no statistical significance difference between two groups regarding age, residence, parity and BMI. Table (2) showed that there was no statistical significance difference between two groups regarding Hgb and ferritin.

Table (3) showed that duration of surgery in HPER group ranged from 26 to 55 with mean ± SD = **44.28 ± 7.76**while in TBA group the Duration of surgery ranged from 32 to 65 with mean ± SD **47.18 ± 8.09** with no statistical significant difference (p=**0.173**) between the two groups. Hospital stay in HPER group ranged from 7 to 31 with mean ± SD = **18.28 ± 6.22**while in TBA group the Hospital stay ranged from 15 to 50 with mean ± SD = **29.32 ± 8.17**with highly statistical significant difference (p= <.001) between the two groups.

Table (4) showed that time to normal activity in HPER group ranged from 2 to 4 with mean ± SD = 3 ± 0.76 while in TBA group the Time to normal activity ranged from 2 to 6 with mean ± SD = 3.93 ± 1.05 with highly statistical significant difference (p= <.001) between the two groups. Time to return to work in HPER group ranged from 2 to 25 with mean ± SD = 5.31± 4.81 while in TBA group the Time to return to work ranged from 2 to 30 with mean ± SD = 6.04 ± 5.2 with no statistical significant difference (p= 0.587) between the two groups. Regarding procedure cost among the study groups. The Cost (x10^2 EGP) in HPER group ranged from 15 to 20 with mean ± SD = 17.52 ± 1.15 while in TBA group the Cost (x10^2 EGP) ranged from 11 to 14 with mean ± SD = 12.93 ± 0.9 with highly statistical significant difference (p= <.001) between the two groups.

Table (5) Regarding complications incidence during after operation among the studies groups unexpected bleeding, vaginal discharge, dysmenorrhea, cystitis and transient urinary incontinence no statistical significance difference between two groups. One patient in TBA group had ballon rupture. Post oberative treatment among the studies groups, regarding antibiotic usage, analgesic usage and required hysterectomy no statistical significance difference between two groups. There was no statistical significance difference between two groups regarding Unexpected bleeding, One patient in TBA group had Balloon rupture side effect 1 (3.57%).

Table (6) showed that baseline PBAC score in HPER group ranged from 165 to 364 with mean ± SD = 263.69 ± 57.07 while in TBA group the Baseline PBAC score ranged from 192 to 589 with mean ± SD = 390.93 ± 99.4 with highly statistical significant difference (p= <.001) between the two groups. 6 months FU PBAC score in HPER group ranged from 3 to 240 with mean ± SD = 25.07 ± 46.9 while in TBA group the 6 months FU PBAC score ranged from 7 to 192 with mean ± SD = 24.04 ± 33.78 with there was no discernible statistical difference between the two groups. Between the two research groups, there was no statistically significant difference in the FU Menstrual results at three and six months Between the two groups .

Table (7) showed satisfaction among the studies groups regarding 3 and 6 months FU satisfaction There was no statistical significant difference between the groups.

Table (1) : Patient characteristics among the studied groups

	HPER group (n = 29)	TBA group (n = 28)	Test of Sig.	P-value
Age			**t = -0.493**	**0.624**
Mean ± SD	**42.72 ± 1.41**	**42.89 ± 1.17**		
Median	**43 (42 - 43)**	**43 (42 - 44)**		
Range	**(40 - 45)**	**(40 - 45)**		
Residence			**X2 = 0.427**	**0.514**
- Urban	**12 (41.38%)**	**14 (50%)**		
- Rural	**17 (58.62%)**	**14 (50%)**		
Parity			**t = 1.345**	**0.184**
Mean ± SD	**2.41 ± 1.09**	**2.04 ± 1.04**		
Median	**2 (2 - 3)**	**2 (1 - 2)**		
Range	**(1 - 5)**	**(1 - 5)**		
BMI			**t = -0.354**	**0.725**
Mean ± SD	**26.48 ± 3.45**	**26.82 ± 3.83**		
Median	**26.2 (23.8 - 29.5)**	**26.05 (23.58 - 30.3)**		
Range	**(19.2 - 31.7)**	**(20.4 - 33.5)**		

t: Independent T test **HPER**: Hystroscopic Partial Endometrial resection **TBA**: Thermal Balloon ablation

Table (2) : Lab investigations results among the studied groups

	HPERgroup (n = 29)	TBAgroup (n = 28)	Test of Sig.	P-value
Hgb (g/dl)			**t = 0.632**	**0.53**
Mean ± SD	**10.12 ± 0.85**	**9.98 ± 0.81**		
Median	**10 (9.4 - 10.7)**	**9.85 (9.45 - 10.65)**		
Range	**(9 - 11.7)**	**(8.6 - 11.2)**		
Ferritin (ng/mL)			**t = 0.024**	**0.981**
Mean ± SD	**55.62 ± 20.05**	**55.5 ± 17.94**		
Median	**56 (42 - 68)**	**60 (44.25 - 67.25)**		
Range	**(24 - 92)**	**(23 - 85)**		

t: Independent T test

Table (3) : Duration of surgery and hospital stay among the studied groups

	HPERgroup (n = 29)	TBAgroup (n = 28)	Test of Sig.	P-value
Durationof surgery			**t = -1.382**	**0.173**
Mean ± SD	**44.28 ± 7.76**	**47.18 ± 8.09**		
Median	**43 (37 - 51)**	**45.5 (43 - 52)**		
Range	**(26 - 55)**	**(32 - 65)**		
Hospital stay			**t = -5.732**	**<0.001**
Mean ± SD	**18.28 ± 6.22**	**29.32 ± 8.17**		
Median	**18 (14 - 22)**	**27 (23 - 35.25)**		
Range	**(7 - 31)**	**(15 - 50)**		

t: Independent T test

Table (4): Time to return to normal activity and work and costs incidence after operation among the studied groups

	HPERgroup (n = 29)	TBAgroup (n = 28)	Test of Sig.	P-value
Time to return to normal activity				
Mean ± SD	**3 ± 0.76**	**3.93 ± 1.05**	**t = -3.816**	**<0.001**
Median	**3 (2 - 4)**	**4 (3 - 5)**		
Range	**(2 - 4)**	**(2 - 6)**		
Time to return to return to work				
Mean ± SD	**5.31 ± 4.81**	**6.04 ± 5.2**	**t = -0.546**	**0.587**
Median	**4 (3 - 5)**	**5 (4 - 6)**		
Range	**(2 - 25)**	**(2 - 30)**		
Cost (x10^2 EGP)				
Mean ±SD	**17.52 ± 1.15**	**12.93 ± 0.9**	**t = 16.781**	**<0.001**
Median	**17 (17 - 18)**	**13 (12 - 14)**		
Range	**(15 - 20)**	**(11 - 14)**		

t: Independent T test, **χ2:** Chi- Square test

Table (5) : complications incidence during and post operative and treatment among the studied groups

	HPERgroup (n = 29)	TBAgroup (n = 28)	Test of Sig.	P-value
Complications				
Unexpected bleeding	**3 (10.34%)**	**0 (0%)**	**X2 = 3.057**	**0.08**
Balloon rupture	**-**	**1 (3.57%)**	**-**	**-**
Vaginal discharge	**2 (6.90%)**	**3 (10.71%)**	**X2 = 0.259**	**0.61**
Dysmenorrhea	**3 (10.34%)**	**2 (7.14%)**	**X2 = 0.183**	**0.669**
Cystitis	**0 (0%)**	**1 (3.57%)**	**X2 = 1.054**	**0.305**
TransientUrinary incontinence	**0 (0%)**	**1 (3.57%)**	**X2 = 1.054**	**0.305**
Antibiotic usage	**0 (0%)**	**1 (3.57%)**	**X2 = 1.054**	**0.305**
Analgesic usage	**3 (10.34%)**	**2 (7.14%)**	**X2 = 0.183**	**0.669**
Required hysterectomy	**2 (7.14%)**	**3 (10.34%)**	**X2 = 0.183**	**0.669**

χ2: Chi- Square test

Table (6):Baseline PBAC,6 months FU PBAC score and menstrual outcomes among the studied groups

	HPERgroup (n = 29)	TBAgroup (n = 28)	Test of Sig.	P-value
Baseline PBAC score				
Mean ± SD	**263.69 ± 57.07**	**390.93 ± 99.41**	**t = -5.899**	**<0.001**
Median	**269 (220 - 306)**	**413 (299 - 442)**		
Range	**(165 - 364)**	**(192 - 589)**		
6 months FU PBAC score				
Mean ± SD	**25.07 ± 46.9**	**24.04 ± 33.78**	**t = 0.096**	**0.924**
Median	**12 (10 - 14)**	**17 (13 - 21.25)**		
Range	**(3 - 240)**	**(7 - 192)**		
3 months FU Menstrual outcomes				
- Normal menses	**13 (44.83%)**	**19 (67.86%)**	**X2 = 4.878**	**0.087**
- Amenorrhea	**6 (20.69%)**	**6 (21.43%)**		
- Menorrhagia	**10 (34.48%)**	**3 (10.71%)**		
6 months FU Menstrual outcomes				
- Normal menses	**17 (58.62%)**	**17 (60.71%)**	**X2 = 2.005**	**0.367**
- Amenorrhea	**8 (27.59%)**	**10 (35.71%)**		
- Menorrhagia	**4 (13.79%)**	**1 (3.57%)**		

Table (7) :Satisfaction score among the studied groups

	HPERgroup (n = 29)	TBAgroup (n = 28)	Test of Sig.	P-value
3 months FU Satisfaction				
- Excellent	**17 (58.62%)**	**19 (67.86%)**		
- Good	**5 (17.24%)**	**8 (28.57%)**		
- Moderate	**5 (17.24%)**	**1 (3.57%)**	**X2 = 5.45**	**0.141**
- Bad	**2 (6.90%)**	**0 (0%)**		
6 months FU Satisfaction				
- Excellent	**17 (58.62%)**	**21 (75%)**		
- Good	**6 (20.69%)**	**5 (17.86%)**	**X2 =2.495**	**0.476**
- Moderate	**3 (10.34%)**	**1 (3.57%)**		
- Bad	**3 (10.34%)**	**1 (3.57%)**		

t: Independent T test, **χ2:** Chi- Square test

DISCUSSION

We discovered in the current study that there was no statistically significant difference (p=0.428) in age between the two groups. There was no statistically significant difference (p=0.61) in Residence between the two groups under study.

There was no statistically significant difference (p=0.232, p=0.561) between the two groups in terms of parity or BMI.

These results were compatible with **Brun et al. [12]** they demonstrated that the two groups did not differ in terms of age, parity, BMI, uterine length, myomas, symptom patterns, or length of symptoms.

Our study showed that complication incidence during operation regarding un expected bleeding and there was no statistical significant difference between the two studied groups

balloon rapture one patient in TBA group had Balloon rupture side effect 1 (3.23%).

El-Toukhy et al. [13], Brun et al. [12], Alaily et al. [14] and Lethaby et al. [15] Considering the negative consequences, no significant complications, such as uterine perforation, significant blood loss, or heat injuries, were reported, and there was no morbidity. In the study by **Gurtcheff et al. [16]** complications such as thermal injury to the intestine, bleeding, uterus perforation and adnexal necrosis have been reported, although these side effects were reported in patients with a history of previous cesarean section. But in another study performed in 2010, 116 premenopausal women with menorrhagia were treated with Cavaterm method and 26 cases had history of previous cesarean section. The study's findings demonstrated that women who had prior cesarean sections did not have a bad outcome and this method of treatment can be used in these patients **[17].**

Duration of surgery in HPER group ranged from 26 to 55 with mean ± SD = 44.23 ± 7.59 while in TBA group the Duration of surgery ranged from 32 to 65 with mean ± SD = 47.65 ± 8.27 with no statistical significant difference (p= 0.095) between the two groups. Hospital stay in HPER group ranged from 7 to 31 with mean ± SD = 18.26 ± 6.03 while in TBA group the Hospital stay ranged from 15 to 50 with mean ± SD = 29.71 ± 8.31 with highly statistical significant difference (p= <.001) between the two groups.

Gervaise et al. [18] reported that The balloon group's mean operating time was 20.3 minutes, while the endometrial resection group's was 44.8 minutes (P < 0.05). All cases in the balloon group had the procedure finished in less than 30 minutes, while only 52.6% of cases in the resection group had it finished in that amount of time (P < 0.05).

Our current findings regarding compication incidence after operation among the study groups (Vaginal discharge, Dysmenorrhea, Unexpected bleeding, Cystitis, Transient Urinary incontinence), There was no statistical significant difference between the two studied groups.

Our study revealed that within the first postoperative month, three mild occurrences were reported: vaginal mycosis (in a lady treated with endometrial resection), transitory urine incontinence (also treated with Cavaterm), and cystitis treated with a 2-day course of antibiotics. For everyday life at home, it took an average of 4 (1–20) and 2 (1–30) days for women treated with Cavaterm and women treated with resection, respectively, whereas for regular professional activity, it required an average of 5 (0–35) and 3 (1–30) days. These variations went unnoticed.

Only a few complications were reported in **Bergeron et al. [19]** review. Larger cohort studies have shown that endometrial ablation/resection carries a <5% risk of complications, such as pelvic infection or fever (1%), uterine perforation (1%), hematometra (2%), and perioperative hemorrhage (2%) **[15].**

In the present study, regarding Antibiotic usage, Analgesic usage and required hysterectomy, the two groups under study did not differ statistically significantly.

If the first surgical treatment fails, there is a risk of needing to have recurrent surgery. reported at different follow-up times. some trials by **Crosignani et al. [20], Dwyer et al. [21]** and **O'Connor et al. [22].** reported the requirement for further surgery at one year's follow-up; and others by **Dickersin et al. [23]** and **Sesti et al. [24]** reported at two years' follow-up. One trial reported it at three years' follow-up **[22]**; and one at four years' follow-up **[25]**. The risk of having a further surgery for treatment failure was, throughout all follow-up periods, more likely for TCRE/ablation than for hysterectomy:

In the present study, Baseline PBAC score in HPER group ranged from 165 to 364 with mean ± SD = 263.69 ± 57.67 while in TBA group the Baseline PBAC score ranged from 192 to 589 with mean ± SD = 390.93 ± 99.4 with highly statistical significant difference (p= <.001) between the two groups. 6 months FU PBAC score in HPER group ranged from 3 to 240 with mean ± SD = 25.07 ± 46.9 while in TBA group the 6 months FU PBAC score ranged from 7 to 192 with mean ± SD = 24.04 ± 33.78 with no statistical significant difference (p= 0.924) between the two groups.

One trial by **Sesti et al. [24]** the PBAC (Pictorial Blood Loss Assessment Chart) score was used to evaluate menstrual blood loss. At one and two years postoperatively, the PBAC score was significantly lower in both groups compared to pretreatment scores.

In the current study, Regarding 3 months FU Menstrual outcomes, between the two groups under study, there was no statistically

significant difference (p= 0.132). There was no statistically significant difference between the two examined groups in terms of the menstrual outcomes at the 6-month follow-up (p= 0.648).

Bouzari et al. [26] showed that all 52 patients underwent endometrial ablation by TBA (Cavaterm™) (group A) and 56 patients were treated with hysteroscopy resection (group B), followed up for 12 months. The mean age of patients in group A and group B were 43.38±5.91 and 38.5±4.21 years, respectively. In this study, 42(80%) and 38(67.8%) of women who were treated with TBA and hysteroscopy resection had a drug history such as: oral contraceptives; medroxyprogesterone; Danazol; Dekapeptid.

The success rate of treatment (amenorrhea, hypomenorrhea, normal menstruation) after one-year follow-up in the two groups (thermal balloon ablation and hysteroscopy resection), was 46(88.5%) and 52(92.9%), respectively, and treatment failure (hypermenorrhea) was 6(11.5%) and 4(7.1%), respectively, but was not statistically significant (P=0.51).

Brun et al. [12] compared thermal balloon and hysteroscopy resection hawever amenorrhea rate 12 months after surgery was higher in thermal balloon group.

In some of these studies, as in **Bouzari et al. [26]** study, amenorrhea rate one year after treatment in thermal balloon group was higher than other endometrial ablating methods, and in some studies the result was reverse, which may be due to the study method, sample size, surgical techniques, patient age, sub mucosal and intramural myoma, or follow-up duration time. However, the overall success rate of endometrial ablation techniques was not significantly different.

In our study, Regarding 3 months FU Satisfaction , There was no statistical significant difference between the two studied groups (p= 0.284). Regarding 6 months FU Satisfaction , There was no statistical significant difference between the two studied groups (p= 0.543).

In **Bouzari et al. [26]** study patient satisfaction rates of thermal balloon (86.5%) and hysteroscopy resection(92.9%) 12 months after surgery were not statistically significant (P =0/27). In **Brun et al. [12]** study, the satisfaction of patients treated with hysteroscopic resection and thermal balloon was 79% and 89%, respectively.

Also, in a meta-analysis in bipolar, microwave, radiofrequency, free fluid ablation and thermal balloon were evaluated, and 12 months after surgery there was no difference in the satisfactions of patients **[27].**

Conclusion

The results of this study show that women with menorrhagia had similar success rates with TBA and hysteroscopy resection. After a 6-month follow-up of treatment, there was no difference between the two groups' surgical success rate or satisfaction. Despite this, TBA is superior to HPER in terms of cost, length of hospital stay, and time needed to resume regular activities.

Declaration of interest

The authors report no conflicts of interest. The authors along are responsible for the content and writing of the paper.

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