Original Investigation

Outcome of endometrial ablation therapy with cavaterm thermal balloon in patients with abnormal uterine bleeding

Karimi-Zarchi et al. Endometrial Ablation - Cavaterm

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Abstract
Objective: The purpose of this retrospective study was to evaluate the long-term outcome of endometrial ablation (EA) therapy with Cavaterm Thermal Balloon in patients with abnormal uterine bleeding (AUB).
Material and Methods: The retrospective cross-sectional study was performed on 227 patients referred to Shahid Sadoughi Hospital in Yazd, Iran with AUB undergoing EA therapy. The data collection tool was a questionnaire containing demographic profiles, menstrual status, treatment success, postoperative complications, and patient satisfaction during the follow-up of 6 months to 7 years after surgery. The treatment response was measured by reduced menstrual bleeding (spotting, normal menstruation, amenorrhea, hypomenorrhea and oligomenorrhea) during the first 6 months after surgery and later.
Results: The mean age of participants was 45.9±5.9 years, and the mean follow-up duration was 21.2±13.2 months. The rate of treatment response was received for 95% in the first 6 months and for 92.1% later; the prevalence of amenorrhea was 41.2%; and the patient satisfaction rate at the end of the follow-up was 89.2%. Dysmenorrhea disappeared in 32.6% of patients. 73.2% of patients wanted to preserve the uterus. Moreover, 1.4% of patients were pregnant in the follow-up period. Up to the end of the follow-up, 4 (1.9%) patients were treated by hysterectomy due to direct result of treatment failure.
Conclusion: The results of this study showed that the EA surgery with Cavaterm thermal balloon was an effective treatment for the AUB. The patient satisfaction rate was favorable and the procedure is safe and is associated with a very low rate of postoperative adverse events. Results indicate that EA surgery is more effective for older patients and less effective for women with myomas, endometrial polyps, adenomyosis and an enlarged uterus. Assessment of these clinical parameters should be considered as a contraindication for EA surgery in patients with AUB.
Keywords: Abnormal Uterine Bleeding, Endometrial Ablation, Hysterectomy, Amenorrhea

Introduction

Abnormal uterine bleeding (AUB) refers to any irregularity in the menstrual cycle in women of childbearing age in terms of frequency, duration and amount of bleeding between menstrual periods, which is one of the most common causes of women in childbearing age referring to clinics [1]. Approximately 16% of hysterectomies occur due to the AUB [2]. Although hysterectomy is a definitive treatment for AUB, as it has been already the second major surgical procedures in the United States [3], a strong tendency to preserve the uterus in developed countries has recently led to greater use of minimally invasive drug therapies, including Mirena IUD (LNG-IUS) and endometrial ablation (EA), even in cases where there is no desire for pregnancy [4, 5] . Drug treatments are the first choice for the treatment of menorrhagia, which unfortunately usually do not work and lead to hysterectomy in more than half the cases, and there is a contraindication in cases such as underlying diseases such as diabetes, and cardiovascular disease [6]. The EA therapy is preferred to hysterectomy due to the benefits of being outpatient, having more speed, less complications, shorter duration of hospital stay and faster recovery [7]. This procedure is performed in two ways, both hysteroscopic (HEA) and non-hysteroscopic endometrial ablation (NHEA). The HEA method uses laser, electric current, or heat energy for coagulation or evaporation of the tissue. The NHEA approach is performed using EA computer systems with the aid of electric current, hyperthermia, cryotherapy or microwave [8]. In cases of internal diseases, patient tendency to preserve the uterus and the failure of medical treatment, EA therapy is an alternative to hysterectomy. The purpose of this study was to evaluate the long-term outcomes of EA therapy with Cavaterm Thermal Balloon in patients with AUB.

Materials and Methods

This was a retrospective cross-sectional occurred at Shahid Sadoughi Hospital in Yazd, Iran in 2018. All aspects of this research were approved by Ethics Committee of the
Yazd Shahid Sadoughi University of Medical Sciences (IR.SSU.MEDICINE.REC.1396.186).

In this study 227 patients referred to Shahid Sadoughi Hospital with AUB, who did not respond to drug therapies or had an impediment to drug and surgical treatment or were reluctant to perform hysterectomy, and were undergoing the EA therapy identified and enrolled. All procedures were performed between March 2010 and September 2017. All participants completed informed consent before surgery. Enrollment criteria were:
1) Premenopausal women ≥18 years old; 2) unwillingness to have fertility and pregnancy; 3) no urogenital infection; 4) natural history of cervical cytology; 5) negative BHCG; 6) no contraindication for EA surgery; 7) underwent endometrial ablation (Cavaterm Thermal Balloon) after March 2010; and 8) had documented follow-up ≥6 months.

Exclusion criteria included congenital uterine anomaly, uterine cavity greater than 12 cm, history of previous cesarean section or myomectomy that results in shortening the diameter of myometre by less than 2 centimeters, presence of coagulopathies, use of anticoagulants, and diagnosed or clinical suspicion of endometrial cancer or any uterine malignancy.

Ablation procedure and follow-up:

Vaginal ultrasound was performed before surgery for the patient, and the thickness of the myometrium, uterine cavity length and myometric length were measured. Endometrial curettage was then carried out to reduce endometrial thickness and the samples were sent for pathological examination. After placing an anesthetic mask, the patient was in a lithotomy condition. The lower abdominal region, vulva, femoral region, and vaginal cavity were sterilized with iodine. The cervix was initially opened using a 6-mm dilator, followed by using a cavaterm system comprising a silicon balloon connected to a catheter with a width of 6 mm and a unit (thermal balloon endometrial ablation device and catheter, Plus cavaterm TM model, Veldana medical SA Co., Switzerland). The silicone balloon length was set based on the size of the uterine cavity. After emptying the air from the cavaterm system, the catheter end was inserted into the fundus, and the balloon was filled by glucose 5% until the pressure reached 230± 10 mmHg, and this pressure was maintained until the end of the treatment. Then, the circulation of fluid and heat began, and EA started after reaching the temperature to 70±10°C. The treatment was continued for 10 minutes and the heat was ceased spontaneously after 10 minutes, the fluid was opened and the catheter was removed (the EA catheter was surrounded by an insulator to prevent thermal damage of the cervix and vaginal canal). The patient was transferred to the recovery ward after the surgery.

Patients were evaluated for 6 months to 90 months after EA therapy within 4 periods of 6 months, 6 to 12 months, 12 to 24 months and more than 24 months after surgery.

Outcome measures

The primary outcomes were change in duration, type of bleeding (amenorrhea, oligomenorrhea, menorrhagia, hypomenorrhea, hypermenorrhea, and eumenorrhea), and bleeding reduction (at least 50% after surgery).

The secondary outcomes were modification of the patient's hemoglobin, and dysmenorrhea (using the VAS system), patient satisfaction, requiring secondary intervention (medical or surgical) for recalcitrant AUB, adverse effect of EA therapy (blood discharge, fever with pain(was defined as body temperature of >37.5ºC), extreme and prolonged suprapubic pain, urinary tract infection, vaginosis, malodorous discharge, vomiting, and uterine rupture), and comparison of variables in two groups treatment respond and treatment failure. In this

study treatment response was defined the bleeding reduction in the patient up to at least 50% six months after surgery. Adverse effect was considered up to six months after surgery.
Data collection was done by means of a questionnaire whose questions were completed by reviewing the medical records of the patients, telephone call and observation of the pathology results.

Statistical analysis:

All descriptive and comparative analyses were performed using the Statistical Package for the Social Sciences (Version 20.0, SPSS Inc., Chicago, IL, USA). Categorical variables were assessed with Chi-squared and Fisher's exact test. Continuous variables were compared by Student's *t*-test. For all tests, *p*-values <0.05 indicated statistically significant differences.

Result

Of 256 women who had undergone endometrial ablation since March 2010 to September 2017 were contacted by telephone, 227 women (88. %) agreed to participate in the study and were enrolled. One out of 227 patients was omitted due to exclusion criteria, which was subjected to hysterectomy during an initial examination with suspicion of endometrial cancer; pathology was metastatic sarcoma. The patient was under radiotherapy after surgery. Moreover, 17 patients did not refer to postoperative follow-up. Finally, the research was conducted on 209 people. According to the result of present study the EA etiology was the tendency to preserve the uterus, ovaries and age conditions in 153 patients (73.2%), as well as the presence of underlying disease as an obstacle to more invasive surgery, such as hysterectomy, in 56 patients (26.8%). The mean age of the participants was 45.94±5.9 years. All patients had a chief complaint of excessive menstruation and a history of drug treatment. Most of patients (75.1%) had normal (proliferative or secretory) pathological results. Patient characteristics before surgery are presented in Table 1.

Based on the result presented in Table 2 the mean of duration of mensuration was significantly decreased from 12.1±5.6 days before surgery to 3.7±4.3 days within the first 6 months (P = 0.001) and 3.1±3.3 days 24 months after EA surgery (P=0.000). The interval of mensuration was significantly increased from 17.2±7.1 days before surgery to 38.5±32.6 days 24 months after EA surgery (P=0.003). The result of primary outcomes in patients before and after EA surgery are presented in Table 2.

Amenorrhea and the bleeding reduction occurred in 193 (95%) within the first 6 months and in 187 (92.1%) after the first 6 months. It should be noted that bleeding reduction was considered in the first 6 months as the main criterion for treatment response. At the end of the follow-up, 84 (41.2%) had amenorrhea. The amenorrhea was defined as menstrual cessation immediately after surgery up to at least 6 months and until the end of follow-up (Figure 1).

Preoperatively, 146 (69.9%) patients had anemia before surgery, whose number was significantly reduced after surgery to 61 (29.2%) patients (P = 0.001). 0f 32.6% women who initially experienced dysmenorrhea reported that their symptoms were either "somewhat improved" or "much improved" versus "no change" or any measure of worsening (Table 3). The result of comparison of anemia and dysmenorrhea in patients before and after of EA are shown in Table 3.

When queried about overall satisfaction with the treatment EA, an equivalent 89.2% of them reported being either "very satisfied" or "satisfied" versus feeling "neutral" or any measure of "dissatisfied" (Table 4).

Generally, 62(29.66%) of patients after EA surgery had received secondary intervention for recalcitrant AUB until follow-up. Of that number 38 patients (18.8%) required drug therapy, of which 29 responded (76.3%) to drug therapy (mostly to 40-mg megestrol acetate half to one per day). Also, 24 (11.5%) patients after underwent the hysterectomy, 23 of which were in the first 3 years after the EA surgery.

The most common adverse events after the surgery was blood discharge less and more than 40 days. The blood discharge less than 40 days was reported in 182 (90.6%) and more than 40 days in 19 (9.4%). Other adverse events included vaginosis, malodorous discharge, uterine rupture, extreme and prolonged suprapubic pain.

The result of Patient satisfaction, secondary intervention and adverse events after EA surgery are presented in Table 4.

Up to the end of the follow-up, 4 (1.9%) patients were treated by hysterectomy due to direct result of treatment failure (uterine perforation (n=3), device dysfunction (n=1)) (Figure 2).

The mean age (P = 0.006) was significantly higher in the treatment response group and the uterus size (P = 0.000) significantly was larger in the treatment failure group. There was no significant relationship between BMI, gravidity, parity, intrauterine pressure and intrauterine temperature, and result of pathology with treatment failure. The result of comparison of variables in treatment response and failure groups are presented in Table 5.

The pathology result after surgery was reported to be normal endometrium (secretory or proliferative) in 157 patients (75.1%). There was no significant relationship between the pathology type and the treatment response (P=0.139) and the risk of future hysterectomy (P=0.084) (Figure 3).

It is noteworthy that, 3 (1.4%) patients were pregnant in the follow-up period.

Discussion

In this retrospective study, the outcomes of EA therapy with Plus Cavaterm^{TM} technique were evaluated in 209 patients with AUB.

The obtained results indicate duration of mensuration as a primary outcome decreased significantly from 12.1±5.6 days before treatment to 3.1±3.3 days after treatment. Intervals between menstrual cycles increased significantly from 17.2±7.1 to 38.5±32.6 days. In consistent with these results in Asgari's study the number of bleeding days per month and intervals between hemorrhagia after EA was significantly decreased and increased respectively[9]. In Famuyide's study the menstrual bleeding rate in the patients with AUB treated with EA method was reduced exclusively, which was associated with lower risk of hysterectomy in the future[10]. In present study, the rate of amenorrhea was 41.2% on the end of follow-up. Similar to our findings the rate of amenorrhea in studies in patients with AUB treated with EA method was reported in range of 19.4-58% [9, 11-16].

In this study, the rate of treatment response ≤6 and >6 months 95% and 92.1% respectively. The treatment response in Sharma's study at the first 6 months and later was 80% and 76% respectively [17]. Wortman claims that women with latent periods of at least 2 years have already demonstrated a good response to EA [18]. Therefore, it can be concluded that although the treatment response is rapid in the EA, however, the patients need long follow-ups after surgery due to the risk of bleeding recurrence.

In this study, most of patients were anemic before the EA surgery. In this regard Bernardi found that a significant percentage of women who report heavy menstrual bleeding are not only iron deficient, but also anemic [19]. Although most of patients suffering anemia had been compensated their anemia after EA surgery. Patients' anemia compensated was expected by occurred amenorrhea and bleeding reduction [20]. Kim claimed EA is an effective alternative to hysterectomy for women with persistent menorrhagia and anemia when supportive measures fail [21].

In the present study was observed dysmenorrhea in majority of patients were improved after EA surgery which this result is consistent with the other studies [9, 15, 22]. Dysmenorrhea is defined as a complaint of pain experienced during or immediately before menstruation. In the pathogenesis of dysmenorrhea, prostaglandins and arachidonic acid metabolites play an important role, being elevated in women with dysmenorrhea [23]. On the other hands prostaglandins and endothelin appear to be powerful vasoactive substances in the control of menstrual blood loss [23]. The result of Cameron's study shows the concentration of The PGE and "total" PG (6oxo PGF1 alpha + PGE + PGF2 alpha) was greater in the endometrium of those women with heavy menses than in those individuals with a normal menstrual loss [24]. Therefore, it can be expected that dysmenorrhea will be improved by reducing mensural bleeding.

In this study, the rate of patient satisfaction with treatment was high (86.6%) consistent with other studies [1, 9-12, 16, 25]. It was reported reduction in blood loss and patient satisfaction rates, caused to improvement of patients quality of life[25, 26].

In present study, 24 (11.5%) patients after the EA surgery were under hysterectomy. According with this result, the rate of hysterectomy in studies was in range of 10-13% [14, 15, 25, 27-29]. Whereas, the rate of hysterectomy in some studies was in range of 17.97%-25% [25, 29]. Contradictions in the observed results may be due to study population and method or technique applied for endometrial ablation therapy. For instances, in Camino study one factor significantly related to the increased possibility of requiring subsequent hysterectomy was the existence of myomas [29].

In this study, 4 (1.9%) cases of hysterectomy were due to the direct result of treatment failure, one patient due to impaired function of the device and 3 others due to perforation of the uterus (one of them was performed four minutes after surgery due to the rupture at the previous arteriovenous malformation (AVM). Although AVM is contraindication for the EA method, the 34-year-old patient, due to insistence on uterine preservation, was subjected to EA therapy by obtaining informed consent for the hysterectomy, and then the patient immediately experienced the hysterectomy with complete preparation. In the study of Rosati out of 5.2% of hysterectomies, 3.9% was related to the direct result of treatment failure [12]. And in Comino's study out of 17.97% of hysterectomies, 9% was related to the direct result of treatment failure [29]. In our study, 95.8% cases of hysterectomy were performed in the first 3 years and the majority of them were within 6 and 12 months after the EA therapy, consistent with the results of Longinotti's study[30].

In this study, the most frequent adverse events were blood discharge (9.4%), vaginosis, malodorous discharge (4.3%), uterine rupture (1.4%), and extreme and prolonged suprapubic pain (0.5%) that were not unexpected based on previous researches [9, 27-29]. A study audit of more than 10,000 EA surgery from the UK found an overall complication rate of 4.4%. The most frequent complications were hemorrhage (2.4%), uterine perforation (1.5%) and cardiovascular and respiratory complications (0.5%)[31]. In Gimpelson's study, the only complication was uterine perforation(0.4%)[32].

In the present study, the likelihood of a lack of treatment response and the risk of hysterectomy was higher in older people, which can be related to the hormonal causes of AUB and is consistent with the results of studies [15, 17, 33]. The result of Nakamura's study showed that age was associated with recurrence of menorrhagia and re-surgery. These findings revealed that the EA surgery may be less effective for younger women with myomas-namely, for women with a longer period of time until the onset of menopause [34].

The perioperative uterus size was greater than 10 cm in 85.7% of non-treatment response cases and in 100% of perforation cases, so maybe to be concluded that the uterus size smaller than 10 cm is a good criterion for choosing a patient for EA to reduce the risk of treatment failure. Consistent with this result Nakamura's study showed uterine cavity length (≥10 or <10 cm) was an independent risk factor for recurrence of menorrhagia and re-surgery[34]. Larger uterine cavity length maybe to be reflected aggressive characteristics of myomas, thus it is not surprising that they are associated with an increased risk for recurrence and re-surgery. Furthermore, we have also encountered 6 patients (42.85%) with myomas, endometrial polyps, and adenomyosis resistant to EA treatment. We found that EA tended to be less effective in this patient population, than in women with normal, simple and complex endometrial hyperplasia. Similar to our findings, in Nakamura's study EA was less effective in women with myomas and adenomyosis. Nakamura claimed that the thickened myometrium in women with adenomyosis caused the resistance to EA treatment and was associated with recurrence or re-surgery. Therefore he suggests multiple rounds of EA treatment may more successfully control menorrhagia from adenomyosis [34].

The incidence of pregnancy after EA surgery in our study was 3 case (1.4%), in which two (more than half) pregnancies were successful. Conversely with our finding, Kohn reported that 85% of pregnancies after EA were terminated with abortion or ectopic pregnancy [35]. Contradictions in the observed results may be due to small sample size of this group. This issue may need to be addressed with large sample size. Also, the patients should be aware that the EA surgery is not a contraceptive method and should apply reliable or permanent contraceptive techniques until menopause.

The results of the present study support this hypothesis that EA surgery is an acceptable, effective, safe, and versatile method to hysterectomy for treatment of patients with AUB.

CONCLUSION

The results of this study showed that the EA surgery with Cavaterm thermal balloon was an effective treatment for the AUB and had satisfactory results in terms of amenorrhea and treatment response levels. In addition, the patient satisfaction rate was favorable and the procedure is safe and is associated with a very low rate of postoperative adverse events. However, our findings indicate that EA surgery is more effective for older patients. Also, our findings indicate EA surgery may be less effective for women with myomas, endometrial polyps, adenomyosis and an enlarged uterus. Assessment of these clinical parameters should be considered a method for predicting resistance to EA surgery in patients with AUB under this procedure. Further researches with large sample size are needed to confirm these results.

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Conflict of Interest: The authors declare that they have no conflict of interest.

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Informed Consent: Informed consent was obtained from all individual participants included in the study.

Authors' Contributions

M.KZ., M.F., A.T., F.SH., L.A., L.Z., SMA.H., carried out concepts and design, literature search, and participated in study. M.KZ., M.F., A.T., F.SH., L.A., L.Z., SMA.H carried out data acquisition, data analysis, and manuscript preparation. All the authors have read and approved the final manuscript. L.M., read and approved the manuscript.

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Table 1- Patient characteristics(N=209)			
Underlying variables		**Mean ± SD**	**Min-Max**
Age, year		45.94±5.9	30-80
Gravidity; n		4.2±2.1	1-14
Parity, n		3.57±1.7	1-12
Weight, kg		73.73±9.9	40-125
Height, cm		158.2±5.3	148-171
BMI, kg/m^2		29.6±3.7	17.8-48.2
Duration of AUB, Month		10.7±3.5	0.33-13.4
Bleeding per month before the EA surgery, day		12.1±5.7	3-30
Duration between menstrual cycles before EA surgery, day		15.9±7.4	0-40
Follow-up duration, Month		21.2±13.2	6-90
		Number	**Percent**
Diagnosis	Normal (proliferative or secretory); n (%)	157	75.1
	Simple endometrial hyperplasia; n (%)	15	7.2
	Complex endometrial hyperplasia; n (%)	2	1
	Myomas; n (%)	6	2.9
	Endometrial polyps; n (%)	21	10
	Adenomyosis; n (%)	8	3.8
Previous curettage		120	57.4
History of medical drug treatment for AUB		209	100
Abbreviations: BMI, body mass index; AUB, abnormal bleeding; EA, endometrial ablation			

Table 2: The result of primary outcomes in patients before and after EA surgery (N=203*)						
Variables	Before	6 m	6-12 m	12-24 m	≥24 m	P value**
Duration of mensuration(d), mean ± SD	12.1±5.6	3.7±4.3	3.3±3.9	3±3.7	3.1±3.3	0.000†
Interval of menstruation(d), mean ± SD	17.2±7.1	24.8±12.4	27.5±16.6	28.7±16.4	38.5±32.6	0.003†
Amenorrhea, n (%)	0	81(39.9)	89(46.1)	81(39.9)	84(41.2)	0.003††
Oligomenorrhea, n (%)	0	5(2.5)	5(2.6)	4(2.4)	3(5.4)	0.01††
Menorrhagia, n (%)	31(15)	7(3.4)	3(3.1)	5(3)	1(1.8)	0.04††
Hypomenorrhea, n (%)	0	51(25.1)	28(14.5)	27(16.5)	11(19.6)	0.005††
Hypermenorrhea, n (%)	19(9.2)	3(1.5)	3(1.6)	3(1.8)	0	0.002††
Eumenorrhea, n (%)	0	56(26.7%)	62(32.1%)	44(26.8%)	18(32.1%)	0.00††
Poly menorrhea	85(41.1)	0	0	0	0	0.001††
Menometrorrhagia	66(31.9)	0	0	0	0	0.00††
Bleeding reduction, n (%)	-	112(55.2)	98(48.2)	75(37)	32(15.8)	-
Treatment response, n (%)	-	193(95)	187(92.1)	156(76.8)	55(27)	-

Abbreviation: d; day, n; number, SD; Standard Deviation
* Hysterectomy was immediately performed for six patients after EA (uterine perforation(n=3), pathologic result (complex endometrial hyperplasia, n=2), and device dysfunction(n=1)
**reported P-value is between pre-operative data and more than 24 months after surgery.
†Student's t test
††Fisher's exact test

Table 3: The comparison of anemia and dysmenorrhea before and after of EA ablation (n=209)			
Variable	Preoperative	6 months after	P value*
Anemia, n (%)	146(69.9%)	61(29.2%)	.000
Dysmenorrhea, n (%)	89(44.1%)	24(11.5%)	.000
*Chi-squared test			

Table 4. The result of patient satisfaction, secondary intervention and adverse events after EA surgery (n=209)		
Variables		**Number (%)**
Patient satisfaction	Very satisfied	170(81.34)
	Satisfied	11(5.25)
	Neutral	14(6.69)
	Unsatisfied	10(4.81)
	Very unsatisfied	4(1.91)
Secondary intervention for recalcitrant AUB	Medical	38(18.8)
	Hysterectomy	24 (11.5)
Adverse events	Blood discharge	19 (9.4)
	Fever, with pain	0(0)
	Extreme and prolonged suprapubic pain	1(0.5)
	Urinary tract infection	0(0)
	Nausea	(0)
	Vaginosis, malodorous discharge	9(4.3)
	Vomiting	(0)
	Uterine rupture	3(1.4)

Table 5. The result of comparison of variables in two groups treatment respond and treatment failure				
Variables		**Treatment response group (n=195)**	**Treatment failure group (n=14)**	**P value**
Age (y); mean ± SD		46.2±5.8	41.7±4.7	0.006*
BMI (kg/m^2); mean ± SD		29.6±3.7	29.1±4.11	0.591*
Parity; mean ± SD		3.6±1.7	3.2±1.1	0.421*
Intrauterine pressure, (mmHg); mean ± SD		225.15±15.6	226.1±15.9	0.891*
Intrauterine temperature(°C); mean ± SD		74.2±3.3	73.35±4.1	0.315*
Uterus size	<10 cm, n (%)	131 (67.2)	2 (14.3)	0.000**
	10 -12 cm, n (%)	64 (32.8)	12 (85.7)	
Results of pathology	Normal (proliferative or secretory); n (%)	149(76.4)	8 (57.1)	0.38***
	Simple endometrial hyperplasia; n (%)	15(7.7)	0	
	Complex endometrial hyperplasia; n (%)	2(1)	0	
	Myomas; n (%)	4(2.1)	2 (14.3)	
	Endometrial polyps; n (%)	19(9.7)	2 (14.3)	
	Adenomyosis; n (%)	6(3.1)	2 (14.3)	
Abbreviation: y; year, kg/m^2; kilogram - meter squared, SD; Standard Deviation, mmHg; Millimeter of mercury, °C; Centigrade, cm; centimeter, n; number *Student's t test **Chi-squared test ***Fisher's exact test				

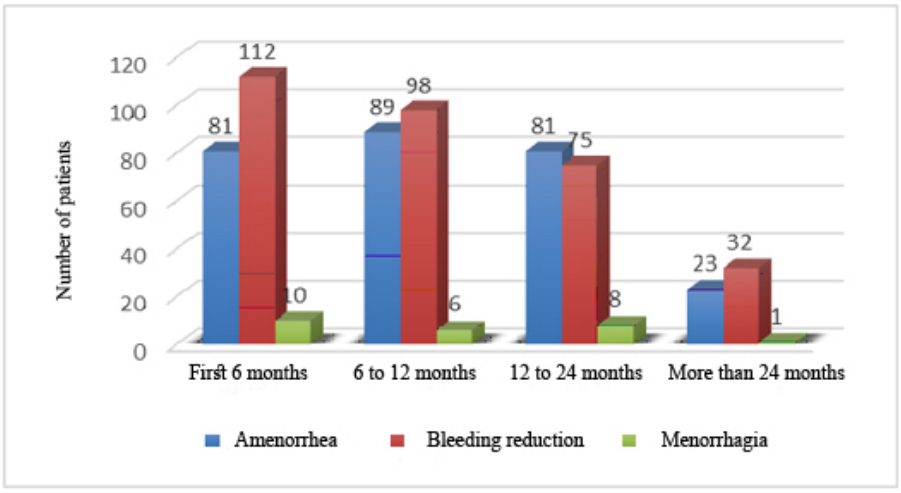

Figure 1- Bleeding state of patients after EA therapy

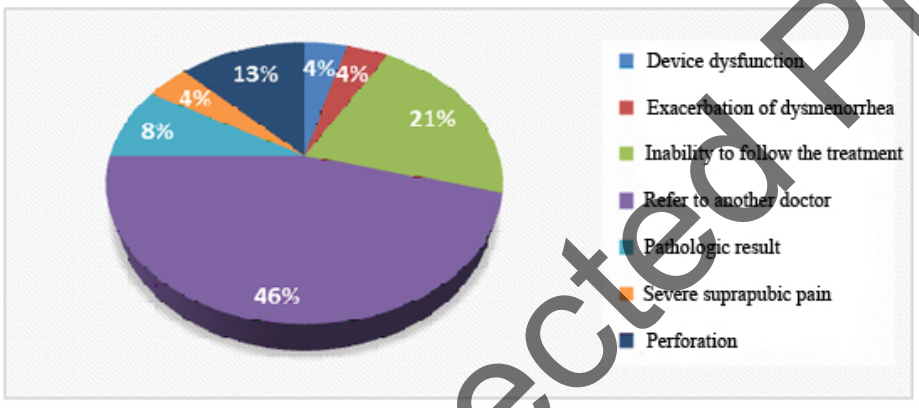

Figure 2- Causes of hysterectomy in patients

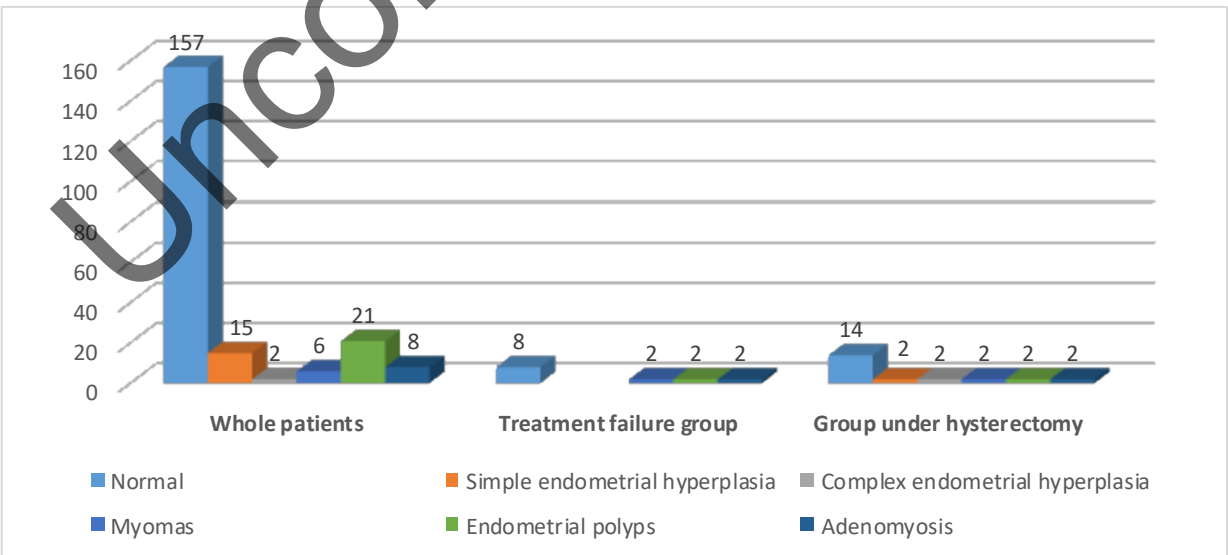

Figure 3- Results of pathology for patients