Journal of Gynecology, Clinical Obstetrics, and Reproductive Medicine

Mukherjee G, et al., 2023- J Gynecol Clin Obstet Reprod Med
Research Article

Factors Predicting Failure of Endometrial Ablation

Gargi Mukherjee[1*], Tanvi Warty[2], Indranil Banerjee[1], Niharika Thakur[3] and Yatin Thakur[4]

Abstract

Objective: To find out the probable reasons for endometrial ablation failure.

Study design: This retrospective observational study was conducted in Basildon and Thurrock University Hospitals. Patients undergoing microwave endometrial ablation or radiofrequency ablation but required additional treatment (medical/surgical) after the procedure were included in the study. The patients having the procedure between 2012 to 2019 were followed up and included in the study. Patient's baseline characteristics including age, BMI, presenting complaint, clinical and sonographic findings including uterine cavity length, and details of the ablation procedure were collected. The endometrial biopsy results, further treatment, and histology in patients who underwent hysterectomy were also noted and appropriate statistical analysis was conducted.

Result: Among the 653 patients that underwent endometrial ablation (either radio-frequency/ microwave), from 2012 to 2019, 100 patients had ablation failure. All patients had undergone hysteroscopy and had a normal histopathology examination prior to undergoing ablation. The most common symptom of failure was a recurrence of heavy bleeding. 67% of patients with ablation failure opted for hysterectomy, 15% for repeat ablation, and 18% had medical management. The results showed that increased age, higher BMI, a larger uterine cavity, and the presence of fibroids and/or adenomyosis are associated with a higher risk of endometrial ablation failure.

Conclusion: This study provides insight into the salient factors contributing to ablation failure which may guide future decisions toward better patient selection and counseling for endometrial ablation.

Keywords: Endometrial ablation; Failure; Age; Body mass index; Adenomyosis; Fibroid; Hysterectomy.

[1]Speciality Registrar, Department of Obstetrics and Gynaecology, Croydon University Hospital, 530, London road, CR77 YE, UK

[2]Senior House Officer, University Hospital Lewisham, Lewisham High St, London SE13 6LH, UK

[3]Foundation doctor year 1-Broomfield hospital- Chelmsford -Essex, UK

[4]Consultant, Department of Obstetrics and Gynaecology, Basildon and Thurrock University Hospital, Nethermayne, Basildon, SS165NL, UK

[*]**Corresponding Author:** Gargi Mukherjee, Speciality Registrar, Department of Obstetrics and Gynaecology, Croydon University Hospital, 530, London road, CR77 YE, UK.

Received Date: 03-09-2023

Accepted Date: 03-20-2023

Published Date: 04-10-2023

Citation: Mukherjee G, Warty T, Banerjee I, Thakur N, Thakur Y. Factors Predicting Failure of Endometrial Ablation. J Gynecol Clin Obstet Reprod Med. 2023;1(2):66-72.
DOI: https://doi.org/10.37191/Mapsci-JGCORM-1(2)-007

Introduction

Heavy menstrual bleeding (HMB) is a broad term that encompasses an excessive loss of blood during menstruation which can occur along with dysmenorrhoea. While HMB may be objectively quantified as a loss of 80 ml or more of blood lost during every menstrual cycle, clinical diagnosis is centered around the physical, mental, and social impact it has on the quality of life of the woman; and as such, can vary remarkably in the perception of the amount of blood loss. the management of HMB can be conservative, medical, or surgical. Endometrial ablation is a widely accepted and minimally invasive procedure to treat HMB.

Endometrial ablation involves devices that aim to remove or destroy the endometrium either under direct vision or blindly i.e., first-generation or second-generation devices respectively. The intended outcomes for both are a reduction in actual or perceived menstrual blood loss, a reduction in dysmenorrhea, and an improvement in the overall quality of life [1].

First-generation ablation devices, namely the resectoscope, while effective, had complications like uterine perforation, fluid overload, and higher failure rates necessitating further procedures [2]. The introduction of global endometrial ablation methods, collectively known as second-generation devices made the procedure significantly safer while maintaining a good success rate [3]. Additionally, they are well-suited to a daycare setting due to technical simplicity and shorter operating time.

Although endometrial ablation is now considered a safe and effective modality, a small proportion of women continue to experience a recurrence of symptoms or to develop new symptoms requiring additional forms of treatment, either medical or surgical (repeat ablation or hysterectomy) [4]. There have been multiple studies [5-7] that predict the success of the procedure, but very few have focused exclusively on the predictors of failure of the second-generation devices. Beelen et al [8] have shown that younger age, prior tubal ligation, and pre-existing dysmenorrhea were found to be associated with failure of endometrial ablation. Obesity has also been purported to be a cause of failure [9]. Eisele et al [9] showed that bipolar radiofrequency endometrial ablation was highly successful in the absence of an intramural mass (88%). Even smaller intramural fibroids or adenomyosis could reduce the success rate (76%). The study of Longinotti et al [4] reported that age is an important predictor for success, especially in women under the age of 35, who appear to have significantly higher failure rates leading to future hysterectomies. In light of the aforementioned studies and the impact HMB and its management have on the quality of life of women, an analysis of the factors predicting success after endometrial ablation using second-generation devices was undertaken.

Materials and methods

This retrospective observational study was conducted at Basildon University Hospital. The common modalities of endometrial ablation offered were Radio-frequency Ablation (RFA) (Novasure) or Microwave

Citation: Mukherjee G, Warty T, Banerjee I, Thakur N, Thakur Y. Factors Predicting Failure of Endometrial Ablation. J Gynecol Clin Obstet Reprod Med. 2023;1(2):66-72.
DOI: https://doi.org/10.37191/Mapsci-JGCORM-1(2)-007

Ablation (MA) (Minitouch). The records of all patients who underwent endometrial ablation, either RFA or MA, from 2012 to 2019 were retrieved and followed–up by accessing Electronic Medical Records. The follow-up period spanned from a minimum of 2 years to a maximum of 5 years, for those patients whose time frames were available. The lower acceptable limit for follow-up was based on previous studies which have shown that intervention is more likely within the first 2 years after ablation [1]. The patients who required further consultation due to persistent heavy menstrual bleeding or developed new symptoms like dysmenorrhoea or pelvic pain which required additional management, either medical (oral progesterone or Mirena insertion) or surgical (repeat ablation or hysterectomy), were included in the study.

The factors evaluated in this cohort of patients include age, BMI, presenting complaint, clinical and imaging (transvaginal ultrasonography was the usual modality) findings, associated medical problems, details of the ablation procedure, lengths of the utero-cervical canal and the results of the endometrial biopsies. The histopathological report of patients who required a hysterectomy as definitive treatment were also documented. The documents were tabulated in a password-protected encrypted spreadsheet and subsequent analysis was done to evaluate the potential risk factors for ablation failure.

Results

Of the 653 patients who underwent endometrial ablation during 2012-2019, either radiofrequency or microwave ablation, 100 patients required repeat treatment; the failure rate was 15.13, which is comparable with the standard failure rate [10].

The initial presenting complaint of all the patients was heavy menstrual bleeding (HMB). 35% of these patients reported additional intermenstrual bleeding and 46% reported dysmenorrhoea.

The average age of the population was 44.5 years with a range of 33–56 years (Median-42 years) (Table 1). The average BMI of the study population was 30.5 with a range of 19-45 (median-30). The common medical disorders encountered in this study population were diabetes (12%), hypertension (10%), fibromyalgia (2%), depression (1%), and asthma (1%) (Table 2).

All patients underwent hysteroscopy and endometrial biopsy+/-polypectomy (in all the cases where the polyp was visible) before the procedure and the length of the utero-cervical canal (UCL) was measured during ablation; the histopathology report of all the endometrial biopsies and polypectomies was within normal limits (Table 3-4). The most common symptom of failure was HMB (Table 5). The majority of patients opted for a hysterectomy as the preferred treatment after failure (Table 6).

The 15 patients, going through repeated ablation had an additional endometrial biopsy of which 7 (46.67%) samples did not yield satisfactory tissue for evaluation, while 8 (53.33%) samples showed the presence of proliferative endometrium. The histopathology results of the 67 patients who

Citation: Mukherjee G, Warty T, Banerjee I, Thakur N, Thakur Y. Factors Predicting Failure of Endometrial Ablation. J Gynecol Clin Obstet Reprod Med. 2023;1(2):66-72.
DOI: https://doi.org/10.37191/Mapsci-JGCORM-1(2)-007

have undergone hysterectomy were reviewed, and only 21 had normal findings. 46 patients had some coexisting pathology– either fibroids/ adenomyosis/endometriosis or a combination of these pathologies (Table 7-8).

Age	Number
< 40	22
≥ 40	78

Table 1: The analysis of age.

BMI	Number
< 24	15
≥ 24	85

Table 2: The analysis of BMI.

Fibroid uterus	20%
Adenomyosis	8%
Endometrial Polyp	7%
Bulky uterus	23%
Fibroid + adenomyosis	3%
Fibroid+ endometrial polyp	5%
Normal	34%

Table 3: Ultrasound findings before the procedure.

UCL	Number
< 8	12
≥ 8	88

Table 4: Distribution by UCL.

Recurrence of bleeding	90%
New onset pain	17%
Intermenstrual bleeding	6%

Table 5: Symptoms of failure.

Hysterectomy	67%
Repeat ablation	15%
Medical management	18%

Table 6: Further treatment accepted.

Citation: Mukherjee G, Warty T, Banerjee I, Thakur N, Thakur Y. Factors Predicting Failure of Endometrial Ablation. J Gynecol Clin Obstet Reprod Med. 2023;1(2):66-72.
DOI: https://doi.org/10.37191/Mapsci-JGCORM-1(2)-007

Open hysterectomy	68.65%
Laparoscopic hysterectomy	22.4%
Vaginal hysterectomy	8.95%

Table 7: Type of hysterectomy performed.

Fibroid	17 (25.4%)
Adenomyosis	17 (25.4%)
Fibroid + adenomyosis	11 (16.4%)
Endometriosis	1 (1.5%)
Normal	21 (31.3%)

Table 8: Data of Hysterectomy.

Discussion

The analysis showed that high BMI, larger uterine cavity, and the presence of additional pathologies, like fibroids or adenomyosis, are more commonly associated with failure of endometrial ablation using second-generation devices.

Previous studies have shown that higher age is associated with better outcomes [7]; a possible explanation for this could be-patients are closer to the age of menopause which led to more successful outcomes. However, the study showed contradictory results. This may be attributed, in part, to the small sample size. The other reason could be the presence of other confounding factors like high BMI, larger cavity size, or the presence of fibroids in the older age group. The incidence of BMI more than 35 in the population aged over 40 years was 37%. This could contribute to the increased chance of ablation failure in the population over 40 yrs. Since the sample size is relatively small, the presence of these confounding factors may have affected the results.

The effect of BMI on the chance of success is an important observation in this study. The probable reasons are described below. First, it may be postulated that patients with higher BMI have an additional source of endogenous estrogen from adipose tissue, which may cause an increased rate of proliferation of the unabated endometrium. Studies have proven that the uterine cornua, fundus, and the interstitial part of the fallopian tubes are the most common areas where endometrium persists even after ablation [11]. Second, the procedure is often technically challenging in women with high BMI, which can lead to incomplete ablation of the endometrium. Fakih et al [12] corroborate the findings by suggesting that a BMI over 34 showed a trend toward treatment failure. Thus, when discussing the chances of a successful procedure during the consultation, women with a higher BMI can be counseled regarding the higher rate of recurrence/ failure as compared to their normal BMI counterparts.

Citation: Mukherjee G, Warty T, Banerjee I, Thakur N, Thakur Y. Factors Predicting Failure of Endometrial Ablation. J Gynecol Clin Obstet Reprod Med. 2023;1(2):66-72.
DOI: https://doi.org/10.37191/Mapsci-JGCORM-1(2)-007

The size of the uterus i.e., the length of the uterocervical canal is another important indicator of failure. A larger uterus is more likely to be associated with uterine pathologies like adenomyosis or uterine fibroids. Another independent risk factor is the presence of fibroids, irrespective of the number or location; though submucosal fibroids are more commonly responsible for distorting the uterine cavity and reducing the chances of success. It has been shown that the presence of even small intramural fibroids could reduce the chance of success [9].

The pathophysiology leading to ablation failure in patients with adenomyosis is still not clear. The presence of adenomyosis leads to an increase in the size of the endometrial cavity – which may cause incomplete ablation of the functioning endometrium. Furthermore, the functioning endometrium inside the myometrium continues to bleed leading to the development of new symptoms of pain. Most studies that seek to establish a relationship between adenomyosis and endometrial ablation failure are retrospective and depend on the histopathological diagnosis of hysterectomy specimens. Riley demonstrated that 43% of hysterectomy specimens were associated with adenomyosis [10]. In this study, we demonstrated the presence of adenomyosis in 41.8% of all hysterectomy patients. There was no conclusive way to evaluate the prevalence of adenomyosis in patients who had successful outcomes following endometrial ablation.

The association between fibroids and poor outcomes of endometrial ablation is controversial. Fibroids tend to distort the endometrial cavity which makes the endometrial ablation procedure technically difficult and often unsuccessful [13].

Similarly, the presence of endometrial polyps can also reduce the chance of success. Comino and Torrejon found that the presence of leiomyomas and endometrial polyps significantly increased the risk for hysterectomy following ablation. This association between the presence of submucous leiomyomas and endometrial ablation failure was also shown by Gemer et al [15], the study concluded that the presence had a statistically significant positive predictive value for the risk of failure. By contrast, Phillips et al [16] in a large observational cohort study of 1000 cases found that the presence of intrauterine pathologies such as myomas or polyps actually decreased the risk of subsequent hysterectomy.

One way of increasing the success rate can be by adding a Mirena coil after endometrial ablation. Since previous studies have established that some parts of the endometrium are still functioning following ablation, the additional use of a Mirena coil could suppress that functioning endometrium and improve the outcome [17]. In a clinical setting, when counseling patients about endometrial ablation, it is important to consider and discuss these factors which may contribute to treatment failure and provide patients with adequate and realistic data.

Conclusion

Appropriate patient selection is a key factor in reducing the failure rate of endometrial ablation. This study found that BMI, length of

the utero–cervical canal, and presence of uterine pathologies are key indicators of failure. This information may help doctors and patients to make clinically–sound, evidence–based and individualized decisions to improve the rate of successful outcomes. It could also help surgeons recommend additional treatments, like a Mirena coil, to increase the chances of a successful procedure. However, this study was retrospective and included a small cohort of patients. Consequently, it could not substantiate multiple other factors. It would be interesting to assess how the location of fibroids affects surgical outcomes. The study was also unable to assess if ethnicity played a role in the outcomes of endometrial ablation. Further large–scale prospective studies may help substantiate the findings and add to the list of predictors of ablation failure.

References

1. Stevens KY, Meulenbroeks D, Houterman S, Gijsen T, Weyers S, Schoot BC. Prediction of Unsuccessful Endometrial Ablation: A Retrospective Study. Gynec Surg. 2019;16:1-9.
2. Arieff AI, Ayus JC. Endometrial Ablation Complicated by Fatal Hyponatremic Encephalopathy. JAMA. 1993 Sep;270(10):1230-2. PubMed
3. Cooper JM, Erickson ML. Global Endometrial Ablation Technologies. Obstet Gynecol Clin North Am. 2000;27(2):385-96. PubMed | CrossRef
4. Klebanoff J, Makai GE, Patel NR, Hoffman MK. Incidence and Predictors of Failed Second-generation Endometrial Ablation. Gynecol Surg. 2017;14(1):26. PubMed | CrossRef
5. Bongers MY, Mol BW, Brolmann HA. Prognostic Factors for the Success of Thermal Balloon Ablation in the Treatment of Menorrhagia. Obstet Gynecol. 2002;99:1060-6. PubMed | CrossRef
6. Shazly SA, Famuyide AO, El-Nashar SA, Breitkopf DM, Hopkins MR, Laughlin-Tommaso SK. Intraoperative Predictors of Long-term Outcomes After Radiofrequency Endometrial Ablation. J Minim Invasive Gynecol. 2016;23(4):582-9. PubMed | CrossRef
7. Longinotti MK, Jacobson GF, Hung YY, Learman LA. Probability of Hysterectomy after Endometrial Ablation. Obstet Gynecol. 2008;112:1214-20. PubMed | CrossRef
8. Beelen P, Reinders IMA, Scheepers WFW, Herman MC, Geomini PMAJ, van Kuijk SMJ, et al. Prognostic Factors for the Failure of Endometrial Ablation: A Systematic Review and Meta-analysis. Obstet Gynecol. 2019;134(6):1269-1281. PubMed | CrossRef
9. Eisele L, Köchli L, Städele P, Welter J, Fehr-Kuhn M, Fehr MK. Predictors of a Successful Bipolar Radiofrequency Endometrial Ablation. Geburtshilfe Frauenheilkd. 2019;79(3):286-292. PubMed | CrossRef
10. Riley KA, Davies MF, Harkins GJ. Characteristics of Patients Undergoing Hysterectomy for Failed Endometrial Ablation. JSLS. 2013;17(4):503-7. PubMed | CrossRef
11. Lisa JR, Gioia JD, Rubin IC. Observations of the Interstitial Portion of the Fallopian Tube. Surg Gynecol Obstet. 1954;92:159-169. PubMed
12. Fakih M, Cherfan V, Abdallah E. Success Rate, Quality of Life, and Descriptive Analysis after Generalized Endometrial Ablation in an Obese Population. Int J Gynaecol Obstet. 2011;113(2):120-3. PubMed | CrossRef
13. Ahonkallio SJ, Liakka AK, Martinkainen HK, Santala MJ. Feasibility of Endometrial Assessment after Thermal Ablation. Eur J Obstet Gynecol Reprod Biol. 2009;147:69-71. PubMed | CrossRef
14. Comino R, Torrejon R. Hysterectomy after Endometrial Ablation-Resection. J Am Assoc Gynecol Laparosc. 2004; 11:495-99. PubMed | CrossRef
15. Gemer O, Kruchkovich J, Huerta M, Kapustian V et al. Perioperative Predictors of Successful Hysteroscopic Endometrial Ablation. Gynecol Obstet Invest. 2007;63-205-8. PubMed | CrossRef
16. Phillips G, Chien P F, Garry R. Risk of Hysterectomy after 1000 Consecutive Endometrial Laser Ablations. Br J Obstet Gynaecol. 1998; 105:897-903. PubMed | CrossRef

Citation: Mukherjee G, Warty T, Banerjee I, Thakur N, Thakur Y. Factors Predicting Failure of Endometrial Ablation. J Gynecol Clin Obstet Reprod Med. 2023;1(2):66-72.
DOI: https://doi.org/10.37191/Mapsci-JGCORM-1(2)-007

17. Vaughan D, Byrne P. An Evaluation of the Simultaneous Use of the Levonorgestrel-Releasing Intrauterine Device (LNG-IUS, Mirena®) Combined with Endometrial Ablation in the Management of Menorrhagia. J Obstet Gynaecol. 2012;32(4):372-4. PubMed | CrossRef

Citation: Mukherjee G, Warty T, Banerjee I, Thakur N, Thakur Y. Factors Predicting Failure of Endometrial Ablation. J Gynecol Clin Obstet Reprod Med. 2023;1(2):66-72.
DOI: https://doi.org/10.37191/Mapsci-JGCORM-1(2)-007