

SPECIAL ARTICLE

Endometrial Ablation – What? When? Why?

Endometrial ablation is the destruction of the lining of the uterus for the treatment of benign heavy menstrual bleeding. The concept is based on the fact that the endometrium is primarily responsible for menstrual blood loss and hence destroying it will result in cessation or reduction in menstrual blood flow.

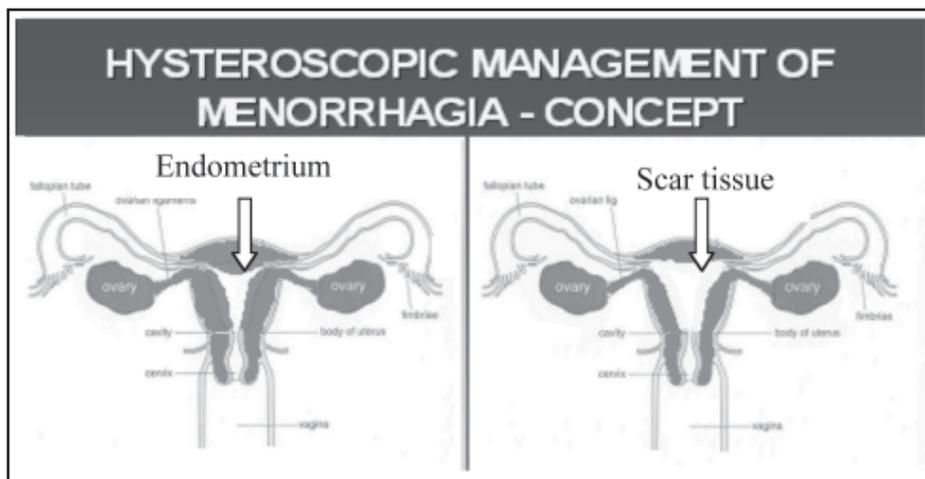
History

Traditionally, heavy menstrual bleeding (HMB) and dysfunctional uterine bleeding (DUB) is managed conservatively with replenishment of blood loss, hormonal treatment and exclusion of malignancy

by endometrial biopsy and or hysteroscopy. If conservative treatment fails, then hysterectomy is the operation to achieve a cure.

In 1978, Neuwirth used a electro-resectoscope for intra-uterine pathology and ablation of the endometrium.

In the mid 1980s, gynaecologists, with the introduction of better endoscopic cameras and modified hysteroscopes were able to destroy the endometrium with laser and electro surgery. Hence, endometrial ablation (EA) became an alternative uterine sparing operation. See Figure 1.



Endometrium is ablated to allow formation of scar tissue

Figure 1.

Why is Endometrial Ablation required?

Hysterectomy has traditionally been regarded as the definitive treatment for HMB. In spite of its 100% success rate and high levels of satisfaction, it is a major surgical procedure with significant and emotional complications, and socio-economic implications.

Many women prefer less invasive surgical treatment, even when they are made aware that the success of the treatment is not always assured. (Nagele et. al 1998)

The modern female is educated and well informed.

They tend to exert their “Rights” and ask for more options. The life span of women have increased with better nutrition especially in developed countries and they strive to stay young and healthy. Given a choice they would avoid drastic operations like hysterectomy and prefer “softer” options in day surgery or outpatient procedures.

The uterus has great emotional significance to woman and this is especially so in Asian cultures and societies. Doctors may argue that the uterus is a useless organ once a woman has bore children or is approaching menopause. But, they may fail to understand that the female mind reasons on a

different scale and places weightage sentimentally.

The WHI study (2002) is a good example of how HRT is being sidelined because of the small increase in relative risk of breast cancer. Osteoporosis which carries a higher mortality risk when it results in femoral fractures is glossed over by many women.

What is Endometrial Ablation?

In 1981, Goldrath et al reported the use of laser photovaporization. In 1983, Decherney reported the use of electrosurgical loop resection of the endometrium followed by Lin et al and Vaincaillie reporting the use of the roller ball in 1988 and 1989 respectively. These forms of EA which are assisted by a hysteroscope are considered as “first generation” techniques and are regarded as the gold standard. See Figure 2.

*TCRE with
Loop and
Roller Ball*

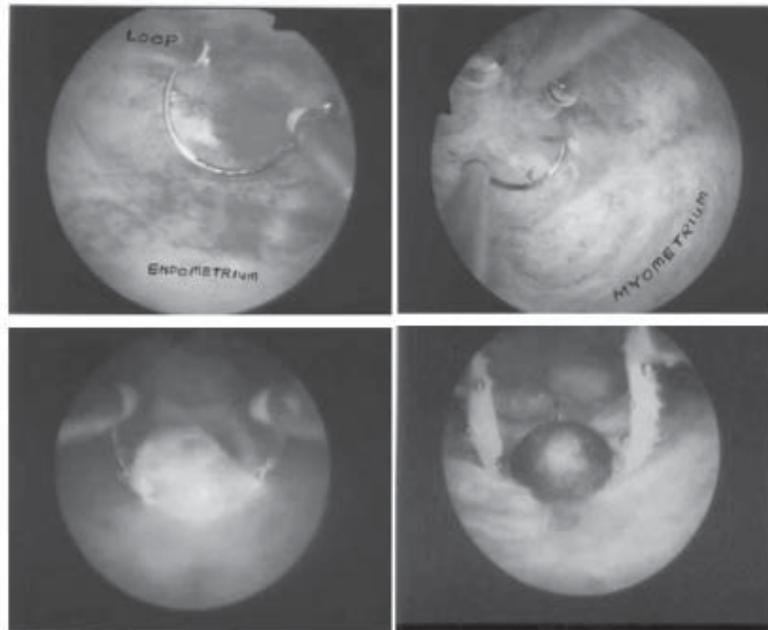


Figure 2.

Pictures show transcervical resection and ablation of the endometrium with loop and rollerball

However, these first generation techniques are very skill dependent, have a steep learning curve and run the risk of fluid overload. Thus, second generation devices are devised by entrepreneurial gynaecologists and the medical equipment industry to provide a safer and better EA alternative.

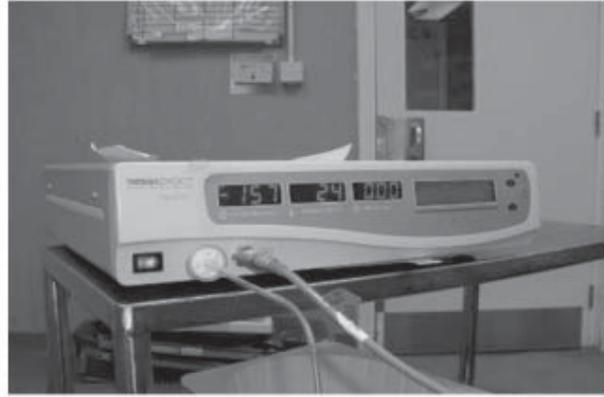
Second Generation Devices

Many second generation devices were born in the mid-

90s and many were shortlived in either being too uneconomical, too ‘user dependent’, inconsistent in results, high in breakdown rate or simply too costly. The first to achieve FDA approval in 1997 was the Thermo Choice Uterine Balloon Therapy (Figure 3) followed in 2001 by cryo-ablation (Her Option), hydro-thermablation (HTA) and electrosurgical ablation (Novasure)(Figures 4&5). In UK, the microwave energy (MEA) was used with good results for the same reason.



Therma Choice J&J



UTERINE BALLOON THERAPY

Figure 3.

FDA Approved Devices

Approved Devices	Manufacturer	FDA Approved Date
ThermaChoice Uterine Balloon Therapy	GyneCare, Inc., (A Johnson & Johnson Company), Manlo Park, CA	December 1997 (original approval, latex balloon) November 1999 (approval for design change to silicon balloon with internal impellar)
Her Option Uterine Cryoblation Therapy System	CryoGen, Inc., San Diego, CA	April 2001
Hydro ThermAblator Endometrial Ablation System	BEI Medical Systems, Inc., (A Boston Scientific Company), Teterboro, NJ	April 2001
NovaSure Impedance-Controlled Endometrial Ablation System	Novacept, Inc., Palo Alto, CA	September 2001

Figure 4.

Procedure Statistics

Approved Device	Probe Size (mm)	Depth of necrosis (mm)	Procedure time (min)	Local Anesthesia (with or without sedation) (%)
ThermaChoice Uterine Balloon Therapy System	5.0	5	8	Unknown*
Her Option Uterine Cryoablation Therapy System	5.0	9-12	20	39
Hydro ThermAblator Endometrial Ablation System	7.8	2-6	10	45
NovaSure Impedance-Controlled Endometrial Ablation System	8.0	3.3-5.7	4.2	73

Figure 5.

In a CME review article of O&G Survey 2002 (Vol 57 No 12) it was stated that new devices for EA offer a safe and rapid surgical option for the elimination or reduction of HMB menstrual bleeding with a 70% to 80% chance of hypomenorrhoea and 13% to 36% chance of amenorrhoea.

A cochrane review in 2002 (Issue 3) by Lethalby & Hickey concluded that the reduction in HMB did not differ significantly between any of the groups. Most of the newer techniques are performed blind and are technically easier than hysteroscopy-based methods. However, technical difficulties with new equipment need to be ironed out.

When to do What?

EA is therefore indicated for women who has failed conservative therapy for benign HMB, but refuses to accept a hysterectomy for sentimental reasons, for fear of losing their femininity, for fear of being less of a woman and for fear of pain. It will also apply to a small group with other medical problems where hysterectomy would carry a higher risk of morbidity or mortality.

The selection of suitable cases is as important as counselling of the patients. Amenorrhoea is not 100% like in a hysterectomy but fortunately, many women do accept favourably oligomenorrhoea rather than amenorrhoea especially in the more conservative societies in Asia. (Lee, Yuen, Lee. Asian Multi Center Uterine Balloon Therapy Review , 2000)

First generation techniques like transcervical resection of endometrium (TCRE) will require a well equipped operation theatre with endovision, resectoscope and a trained operation room team. Besides the skill of the surgeon, the coordination of anaesthetic team and scrub team in monitoring fluid input and output and vital signs, are of paramount importance. Skills and experience are learned partly from mistakes but in hysteroscopic resection, mistakes can be costly and disastrous. Hence, it is important to hystero-resect under supervision for beginners and to select suitable cases. Big cavities and submucous fibroids of more than 3cm in diameter are generally not suitable for beginners. Thinning the endometrium with Danazol or GnRH is highly recommended.

Second generation devices are easier to master and hence have a wider appeal to gynaecologists but the setbacks are the initial capital outlay to purchase the equipment, the cost of the disposables and the maintenance of equipment. Most of them are portable, like uterine balloon therapy which allows different clinics to share cost and to schedule and group patients on rotation. Big items like MEA and HTA are less transportable. Each device has a different protocol for patient preparation, hence, preference by users vary.

What is the Best?

According to Roy et al., O&G Survey 2002, the instrument that promotes an affordable, simple procedure that can be quickly performed in an office setting under mild anaesthesia with minimal operative and post operative pain, will be most desirable.

However this is not so simple, as the answer to it depends on whose point of view. Is it the gynaecologist, hospital administration or the patient? See Figure 6.

	<p style="text-align: center;"><u>What is the Best? Whose point of view?</u></p>
Patient	<ul style="list-style-type: none"> • Effective • Painless • Minimally surgery, safest • No hospital stay • Economic consideration
Doctor	<ul style="list-style-type: none"> • Best treatment for patient • Least complication • Within his skill level • Economic consideration
Hospital	<ul style="list-style-type: none"> • Economic consideration • Logistics, equipment, manpower • Safety, maintenance

Figure 6.

Hysteroscopic resection may be favoured by a hospital that has an existing endovision system and could not afford to purchase a second generation device. On the other hand, a village hospital may find a second generation device, easier to operate and disposable parts are recycled for economic reasons.

The management may choose based on price and after sales service. Medical Insurance plans may be financially more rewarding for doctors to perform a hysterectomy than avoiding it. Alternatively insurance policies may stipulate EA as the treatment of choice before a hysterectomy. Despite the introduction of

good effective EA devices , hysterectomy rates are not seeing a decline in countries where EA is available. This may also be due to choice of treatment based on financial considerations. Figure 7 gives an example of the hospitalization costs in a Singapore

private hospital for the treatment of EA. Hence, making a decision is beyond evidence based medicine. It is often influenced by “economy based medicine” and hopefully, “experienced based medicine” provides the answer.

What is the Best?		
Private Hospital in Singapore		
Procedure	Hospital Fee (S\$)	Doctor's Fee (S\$)
Hysterectomy	\$2,500	\$2,500
LAVH	\$3,500	\$3,500
TCRE	\$1,800	\$1,600
ThermaChoice	\$1,800	\$1,600
MEA	\$1,800	\$1,600

If post-operative result are the same in both first and second generation techniques, then the choice will depend on level of training and cost effectiveness.

Issues to be considered

- Pre-Operative Management
- Ultrasound
- GnRh
- Investment in Capital Equipment
- Technical back up

Figure 7.

Conclusion

Hormonal therapy despite its side effects and poor patient compliance has found a reliable effective option in the progestogen device, Mirena. Its proven effectiveness in HMB is leading to a reduction in hysterectomy rates and challenging the new generation EA devices.

The interest of the patient should be every doctor's

priority. Hence, the best method is one which the gynaecologist is most proficient at, in his optimum environment that gives the safest satisfactory outcome to the patient.

Dr Keen Whye LEE

Medical Director
Gleneagles Minimally Invasive Surgery Centre
Gleneagles Hospital ,Singapore

REFERENCES

1. A.Lethaby ,M Hickey (2002) *Endometrial destruction techniques for heavy menstrual bleeding; a Cochrane review. Human Reproduction, Vol 17, no.11 2795-2806.*
2. Goldrath, Fuller, Segal (1981) *Laser photovaporization of endometrium for the treatment of menorrhagia. Am.J. Ob Gy., 140, 14-19.*
3. Jones, McGurgan, Sutton (2000) *Second –generation endometrial ablation techniques. Current Opinion in O&G, 12: 273-276*
4. Lee, Yuen, Lee (2002) *A Multicentre Review of Thermo Balloon Endometrial Ablation for the Treatment of Menorrhagia in Asia*
5. Lin, Miyamoto, Tomomatu (1988) *The development of a new hysteroscopic resectoscope and its clinical applications on transcervical resection and endometrial ablation. Jap J Gyn Obs Endosc., 4, 56-59.*
6. Nagele, Rubinger, Magos (1998) *Why do women choose endometrial ablation rather than hysterectomy? Ferti.Steril., 69, 1063-1066.*
7. Roy, Kelly, Mattox, John (2002) *Advances in Endometrial Ablation. O&G Survey, Vol 57(12). 789-802.*
8. *Singapore Cancer Society Yearbook (1993-1997) published 2000*
9. Vaincaillie (1989) *Electrocoagulation of the endometrium with the ball-ended resectoscope. Obstet. Gynaecol., 74, 425-427*
10. Valle R F (1983) *Hysteroscopy for Gynaecologic Diagnosis. Clinical Obstetrics and Gynaecology 26: 267*
11. Wamsteker K (1977) *Hysteroscopie. Thesis leiden, The Netherlands*
12. Wamsteker K, Emanuel MH, S de Blok (1993). *Hysteroscopy in Gynaecological Practice Organon's Magazine on Women & Health No. 2: 27-29*