Singapore Journal of Obstetrics and Gynaecology
July 2002; 33(2): 1-16

19th Benjamin Henry Sheares Memorial Lecture, 19 January 2002: Enhancing Optimum Practice and Safety of Hysteroscopy in Modern Gynaecology

Lee Keen Whye

INTRODUCTION

Hysteroscopy is only slowly gaining momentum although it was first performed as early as the 19th century. The reasons could be attributed to the difficulty in distending and visualising the uterine cavity and the early belief that a blind uterine curettage is all that is needed. Modern medical practice has seen many subspecialities employing endoscopy as a standard diagnostic tool e.g. gastroenterologist. But, the gynaecologist is still lagging behind.

Diagnostic hysteroscopy is relatively easy to perform like blind uterine curettage and has a low complication rate. It is the operative hysteroscopy and the hysteroscopic resectoscopy which have a steep learning curve and potential life threatening complications that all hysteroscopists have to be alerted to.

AIM

1. To study the hysteroscopic findings of 133 patients with abnormal uterine bleeding with a rigid continuous flow hysteroscope in a private gynaecology practice.

2. To draw a protocol on the technique of hysteroscopic resection with electrosurgery.

3. To draw a management protocol to prevent fluid overload complications in hysteroscopic resection.

METHODOLOGY & RESULTS

A total of 133 women between the ages of 20 – 60 with complaints of abnormal uterine bleeding attending a private gynaecologist's clinic were hysteroscoped in an office setting under neuroleptic sedation and a rigid hysteroscope with a 4.5mm diameter was used. Dextrose 5% or normal saline was used to distend the cavity for visual inspection.

Macroscopic results showed 38% polyps, 8% submucous fibroids and 50% normal cavity.

Patients left the clinic within a few hours with no immediate or delayed complications. The findings conclude that diagnostic hysteroscopy has many advantages over blind D & C especially with the introduction of endometrial ablative methods.

The two protocols on technique of hysteroscopic resection and the prevention of fluid overload, were formulated after evaluating the operative results of 70 females with menorrhagia, due to benign histology like polyps, submucous fibroids (Type 0,1), and normal endometrium, who had hysteroscopic endometrial resection or myomectomy (TCRE/TRCM). Success rate of over 90% was achieved. Complication rates were relatively low, with 2.8% fluid overload, 1.4% bleeding and 2.8% haematometra and all these are comparable with other studies.

With the above results and data collection, a guideline is drawn to suggest recommended infusion pressure, fluid input and output monitoring and the maximum volume of Glycine 1.5% (3 bag rule) to be used for uterine distension.

Techniques in ensuring good visibility like dealing with problems of bubbles, blood and chips were also elicited.

CONCLUSION

With the introduction of endoscopy in gynaecology, our management of patients is more transparent and patients are more participative in decision making. The role of blind uterine curettage will soon be in question in the society where hysteroscopy is readily available.

The advent of new endometrial ablative methods places hysterectomy another step back as a last resort for the treatment of abnormal uterine bleeding.

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PREFACE

My interest in hysteroscopy was ignited in 1994 by a colleague who showed me the view of the endometrium through a rigid continous flow diagnostic hysteroscope. The endometrial floor and pathology was 'lifted up' by a gentle sweeping current. Polyps, fibroids and endometrium were better appreciated like an underwater world. Visual field was much clearer than using carbon dioxide insufflation and most of all the cavity exposes itself to a panoramic view for all to appreciate its secrets. I often imagine that abnormal uterine bleeding is like a lady in distress crying for help. Science has given us, gynaecologists, a hysteroscope but it is the art of hysteroscopy that will help the crying womb.

I have read the works of many hysteroscopists. I have attended hysteroscopic procedures done by many great surgeons like Dr. Wamsteker, Dr. de Blok, Prof BL Lin and even had the opportunity of operating with some of them, I have learned from the greatest and also from the weakest. From the greatest, I have learned their mastery of the hysteroscope, their humble learning curve, from the weakest I have learned to solve their problems and their doubts. All of them have helped to shape my hysteroscopic practice one way or another.

I often wonder why gynaecologists are the pioneers in using laparoscopes and yet hysteroscopy is not a preferred diagnostic aid over conventional blind curettage. The gastrooenterologists and the ortolaryngologists have far surpassed us in adopting endoscopes in their clinical practice. Are we ignorant, obstinate or complacent? The reason could be in our early teaching that D & C is both diagnostic and curative, is a faith so deeply entrenched that it is difficult to change in one generation of gynaecologists. The other reason could be that the risk of endometrial carcinoma is indeed low (8.1 per 100,000 females per year in Singapore) and hence most blind curettage will not chance upon a positive malignant histology. If recurrent uterine bleeding occurs then, hysterectomy is the commonest preferred treatment. This view will change with the introduction of endometrial ablation as an alternative treatment for dysfunctional uterine bleeding or benign uterine bleeding. All the first and second generation endometrial ablation techniques will require an endometrial biopsy preferably through a hysteroscope. Hence, diagnostic hysteroscopy will soon be mandatory in modern gynaecologic practice prior to any form of endometrial ablation.

I will present a collection of diagnostic hysteroscopic cases conducted in my clinic and share my views. But my greatest satisfaction so far in hysteroscopy is to be able to write a practical guideline of hysteroscopic resection for beginners in a simple readable style from personal experience, trials and tribulations.

Last but not least, I would like to thank Dr.Jiwan Steven Singh (who is now practising gynaecology in Australia) for being that first colleague to show me the modern hysteroscope.

OFFICE-HYSTEROSCOPIC FINDINGS OF 133 PATIENTS WITH ABNORMAL UTERINE BLEEDING

AIM

To study the hysteroscopic findings of women attending a private gynaecologist's clinic with the complaints of abnormal uterine bleeding per vaginum.

A total of 133 women between the ages of 20 to 80 were seen at a private gynaecologist clinic with abnormal uterine bleeding per vaginum from April 1997 to December 1999.

METHOD

All patients with menorrhagia, intermenstrual bleeding per vaginum, irregular spotting and post-menopausal bleeding were included. Menorrhagia is defined as excessive heavy menstrual bleeding occuring on a regular or irregular basis. There were 3 breast carcinoma patients who were on Tamoxifem therapy and were scoped because of blood staining per vaginum after a period of amenorrhoea. All cases were excluded for pregnancy using ultrasonography and urine HCG test. Patients with known malignancy, anticoagulant therapy or uncontrolled endocrine disorders were excluded from this study.

Hysteroscopy was done for menorrhagia cases only when vital signs were stable and bleeding was arrested with progestogen injections or oral hormonal therapy. GnRH or Danazol was used in patients who may require a period to build up Hb level or other planned procedures like ablation or hysterectomy.

A rigid continuous flow Olympus hysteroscope with a 3.0mm diameter scope and a 4.5 mm diameter outer sheath was used.
Sedation was either neuroleptic with I/V Dormicum 5mg and I/V Fentanyl 50ug or nothing in some cases. The choice was up to the patient.
Patient was put in a lithotomy position.
Vulva and vagina was cleansed with Chlorhexidine 0.05% or iodine.

A Sim's speculum was introduced into vagina and a single-toothed vulsellum was applied to the anterior cervix for traction.
The cervix was then inspected for scarring or rigidity. Cervical os was dilated to Hegar 5, if necessary.
The rigid hysteroscope was then passed into the cervical canal with visual guidance from the TV monitor. The images were seen on a 14" TV monitor and a printer was used for recording[1].
It should 'swim' through the cervical canal into the cavity without causing 'abrasions' to the cervical endothelium or endometrial lining. Distension of the uterine cavity was achieved with instillation of Dextrose 5%, Saline or sterile water by way of a 50cc syringe or drip set.

The entire cavity was inspected systematically from fundus ostii, mid cavity towards the cervical canal. A minimum of 4 shots from different angles was made on photo print. Histology of any suspicious pathology and the endometrium was taken with biopsy forceps or sharp curette. Finally, a uterine sound was passed to measure the depth.

RESULTS

The median age of these 133 women was 43 years and mean was 41.6 years.

On hysteroscopy 50% had normal findings,
38% had polyps,
8% had submucous fibroids and
4% had a mixture of polyps and submucous fibroids.

This is quite similar to a bigger study done by Valle from NW University Medical School of Chicago, published in 1963 in Clinical O & G of 553 patients[2]. (Table 1 & 2).

The percentage of patients with anaemia (haemoglobin level <10gm%) was 62.4%.

When these 133 patients were divided into 2 groups.

Group A: female with **cyclical** excessive menstrual bleeding 86 patients

Group B: female with **non-cyclical** bleeding e.g. irregular bleeding, prolonged bleeding or spotting per vaginum 47 patients

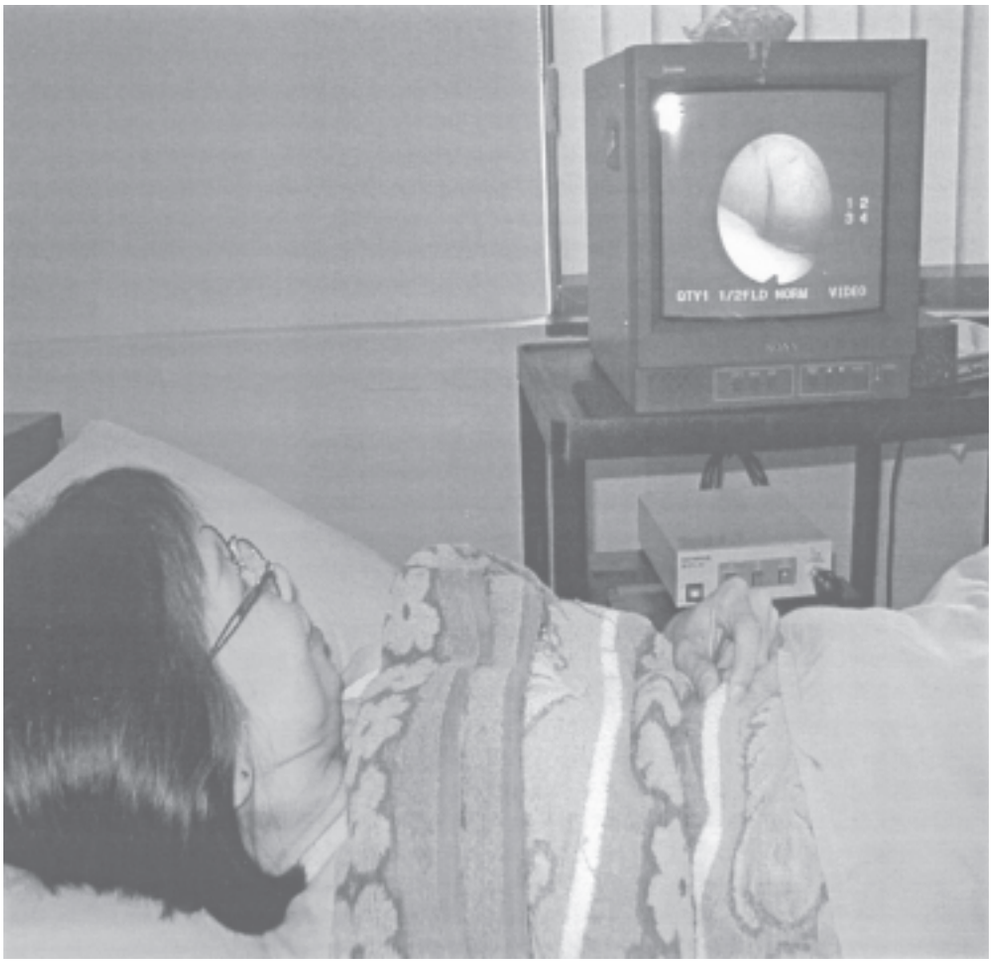


TABLE 1
Hysteroscopic Findings in Patients of Reproductive Age With Abnormal Uterine Bleeding

Finding	No. Patients (Total 419)	Percentage
Normal intrauterine visualization	142	33.9
Endometrial polyps	165	39.4
Submucous leiomyoma	68	16.2
Adenomatous hyperplasia	16	3.8
Intrauterine adhesions	9	2.1
Intrauterine foreign body (unsuspected)	7	1.7
Uterine septum	7	1.7
Caesarean section scar defect	5	1.2

RAFAEL F VALLE, MD

TABLE 2
Hysteroscopic Findings in Patients With Postmenopausal Bleeding

Finding	No.Patients (Total 134)	Percentage
Normal intrauterine visualization	59	44.0
Endometrial polyps	37	27.6
Atrophic endometrium	17	12.7
Submucous leiomyoma	12	8.9
Adenomatous hyperplasia	6	4.5
Adenocarcinoma of endometrium	3	2.3

RAFAEL F VALLE, MD

Anaemia with Hb level < 10gm%

54.6%(47/86) in group A (cyclical) had Hb < 10gm%.

Surprisingly there were more patients that were anaemic, 76.5%(36/47) in group B than group A.

Hysteroscopic findings

Both groups have visible pathology which would otherwise have been missed on blind curettage. Group A had 54.6% of polyps, submucous fibroids or mixture of both seen whereas Group B had 44.6% of visible pathology.

Histology

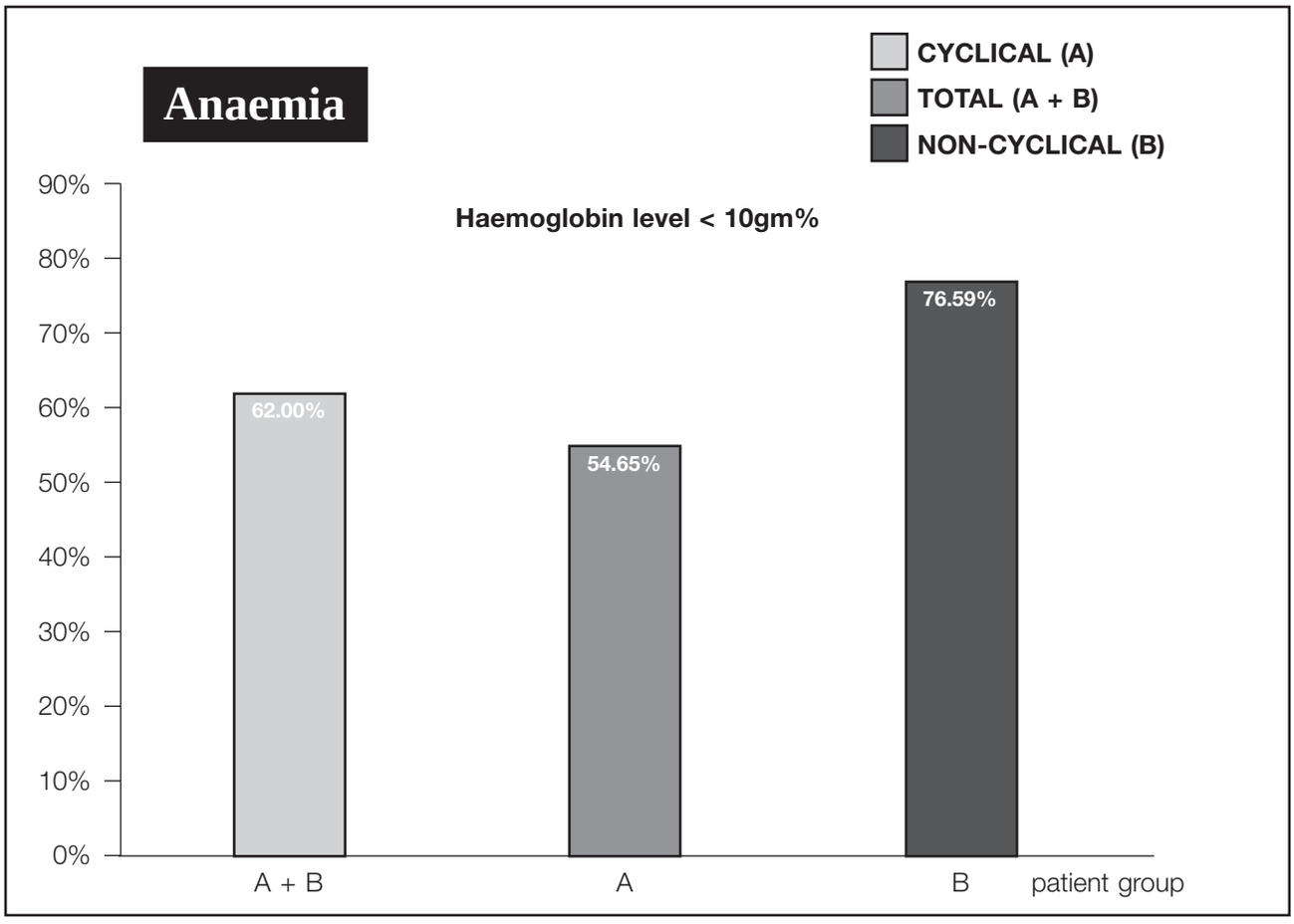
Both groups A & B had a higher incidence of secretory endometrium than proliferative endometrium. In group B, there was a case of adenocarcinoma and 2 persons had no histology obtained, because the endometrium was thin and atrophic.

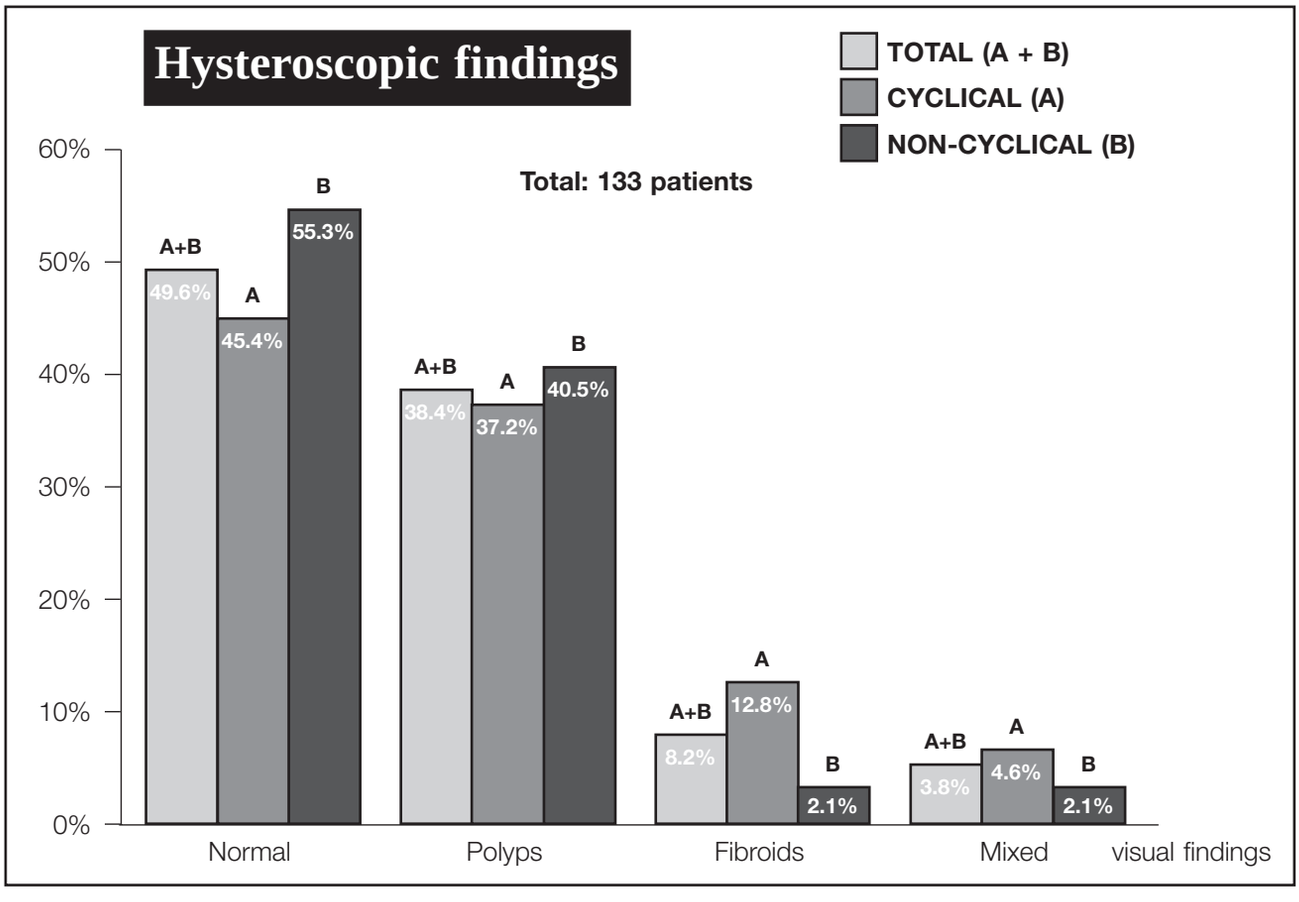
Treatment

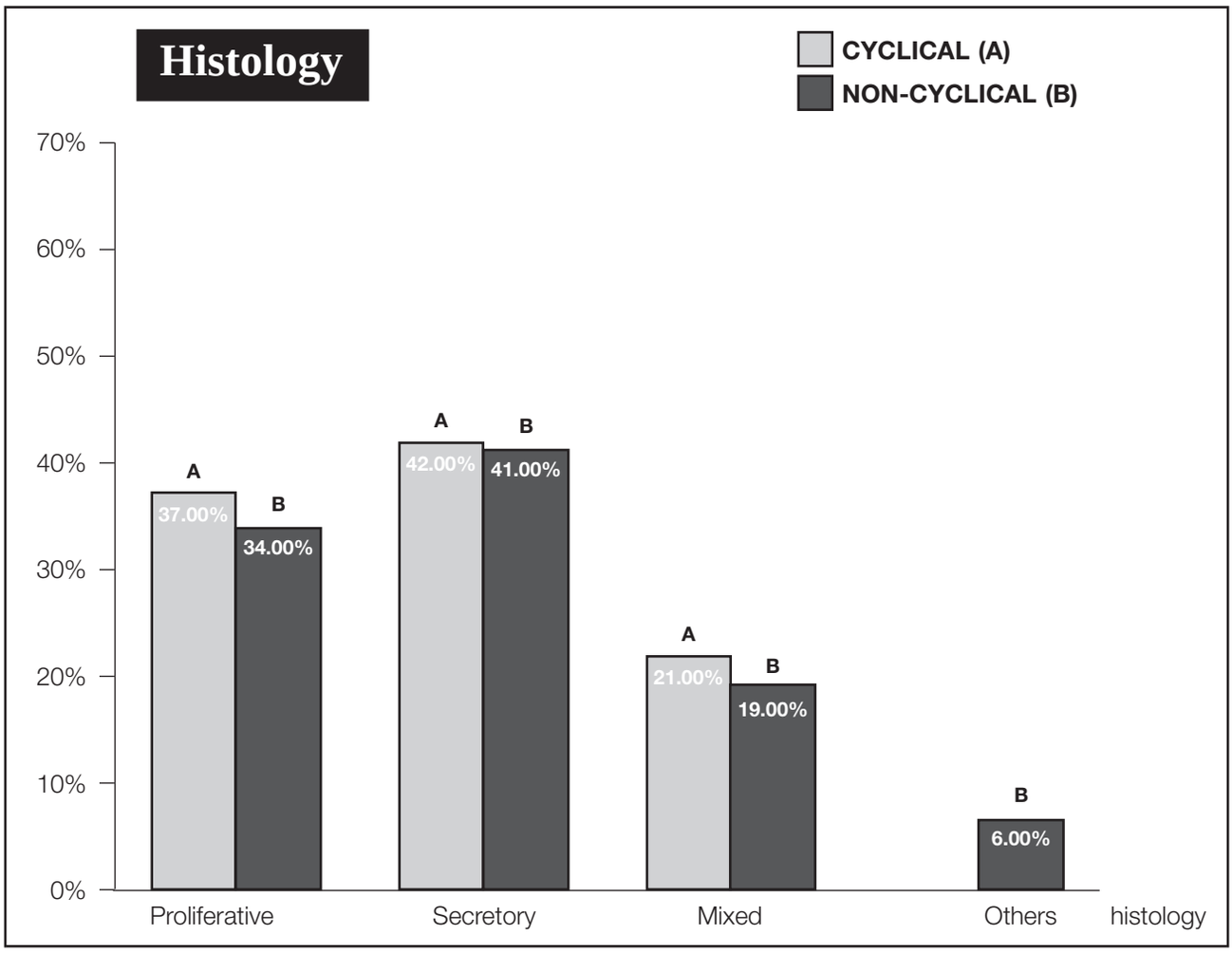
Only 25% of patients in the menorrhagia group A needs no treatment or simply given haematinics, whereas a higher percentage of patients (40%) in group B recovered spontaneously without needing any surgical procedures.

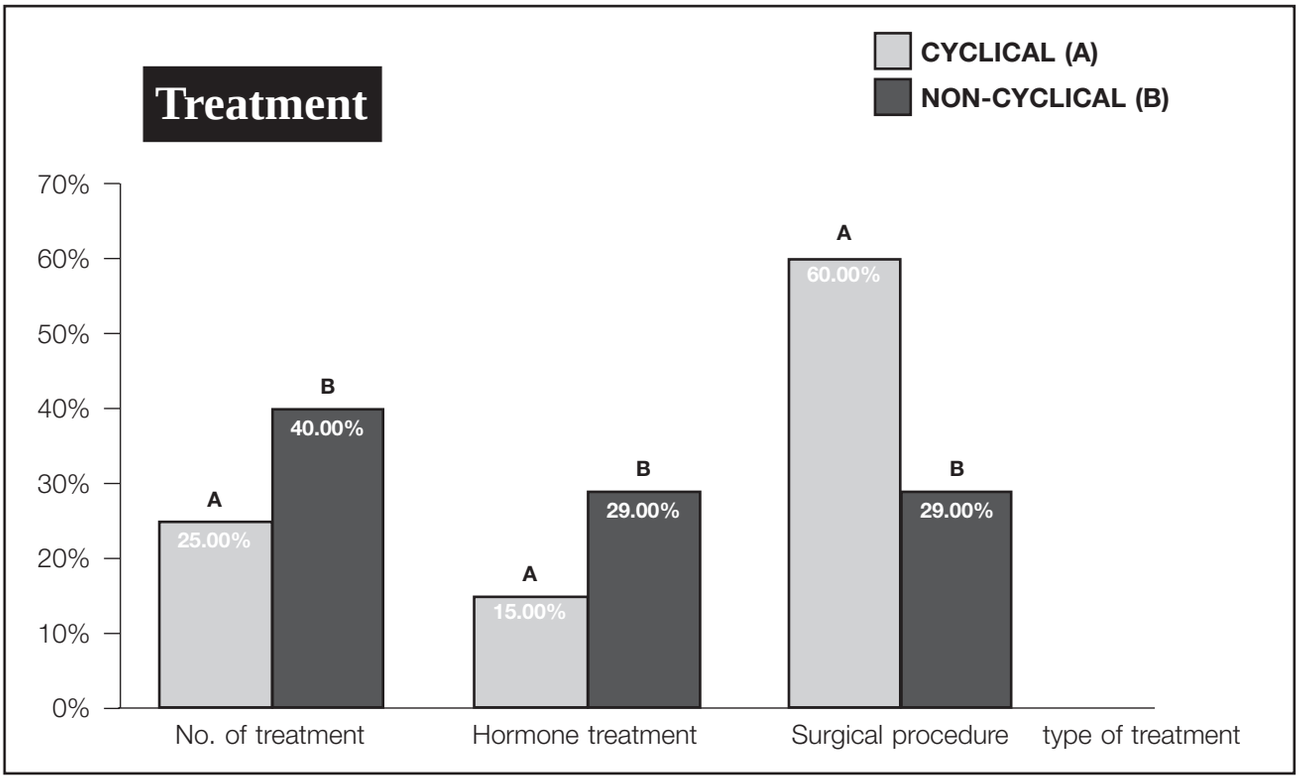
The percentage of hormonal treatment (OC or HRT) was higher in group B (29%) than group A (15%).

60% of group A required some form of surgical procedure whereas only 29% of group B required it.


Anaemia
CYCLICAL (A)
TOTAL (A + B)
NON-CYCLICAL (B)
Haemoglobin level < 10gm%
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
62.00%
54.65%
76.59%
A + B
A
B
patient group


Hysteroscopic findings
TOTAL (A + B)
CYCLICAL (A)
NON-CYCLICAL (B)
Total: 133 patients
60%
50%
40%
30%
20%
10%
0%
A+B
49.6%
A
45.4%
B
55.3%
A+B
38.4%
A
37.2%
B
40.5%
A+B
8.2%
A
12.8%
B
2.1%
A+B
3.8%
A
4.6%
B
2.1%
Normal
Polyps
Fibroids
Mixed
visual findings


Histology
CYCLICAL (A)
NON-CYCLICAL (B)
70%
60%
50%
40%
30%
20%
10%
0%
A
37.00%
B
34.00%
A
42.00%
B
41.00%
A
21.00%
B
19.00%
B
6.00%
Proliferative
Secretory
Mixed
Others
histology


Treatment
CYCLICAL (A)
NON-CYCLICAL (B)
70%
60%
50%
40%
30%
20%
10%
0%
A
25.00%
B
40.00%
A
15.00%
B
29.00%
A
60.00%
B
29.00%
No. of treatment
Hormone treatment
Surgical procedure
type of treatment

DISCUSSION

In clinical practice, it is difficult to group patients into different forms of abnormal uterine bleeding like polymenorrhoea, metrorrhagia etc. Furthermore, their definitions are not universal and difficult to remember in daily practice. History taking in assessing the amount of bleeding is difficult and even more so in trying to differentiate the various patterns of bleeding. It can be frustrating to both patient and doctor. Very often, the distressed patient will tell you she is bleeding profusely and wants treatment fast. Hence, I have decided to divide patients into a group that can correlate to regular pattern according to their cycles (A) and those that do not (B). This is to make it easier for all practising clinicians to recognise just two simple abnormal bleeding groups which is what we see in daily clinical practice.

Conventional blind curettage, will miss 50% of endometrial pathology and to believe that blind curettage is both diagnostic and curative is a fallacy[3,4]. Often, we find a cervical polyp on speculum examination and after avulsing it, recurrence is common. This is probably due to the presence of polyps in the endometrial cavity which was not seen at the cervix and not completely curetted out. The study also showed that most pathlogy belonging to abnormal uterine bleeding were benign.

It is important to include a simple haemoglobin level among other relevent blood tests. As can be seen in this study more than half of the patients will need treatment for anaemia. Surprisingly this study finds that more patients are anaemic in the non-cyclical uterine bleeding group than the commoner cyclical bleeding group. The reason could be the sudden nature of the onset of bleeding in the non-cyclical group versus the chronic progressive development of anaemia in the cyclical group. The cyclical group may have been treated or self-medicated with vitamins and traditional “nutrients”.

Hysteroscopy can be performed safely in a clinic and it is possible to provide the anxious patient with some form of diagnosis, treatment plan and prognosis immediately[5]. Very often the reassurance given about the benign nature of the hysteroscopic finding, while waiting for the laboratory report in those few tormenting days, is a big relief to the patient and family.

Office hysteroscopy besides avoiding hospital cost, is important for preassessment workout with regards to newer endometrial ablative technology, like uterine balloon therapy and the microwave ablation.

CONCLUSION

1. A better diagnosis is achieved with hysteroscopy thereby providing a better treatment advice. This procedure can be done effectively in a clinic thus avoiding high hospital costs.

2. Anaemia or haemoglobin level of < 10gm% is expected in half (62.4%) of the patients with complaints of abnormal uterine bleeding. Therefore, missing these cases will mean more than half of patients will not be treated accordingly.

3. At hysteroscopy, 50% of the time the endometrium is normal and 50% abnormal. Most of the time the commonest abnormality are polyps (38%).

4. Histology is most likely benign (Risk of endometrial Ca-8.1 per 100,000 females)[6] Therefore, one may safely avoid biopsy of an atrophic endometrium in post-menopausal women when hysteroscopic visualization is normal. This is to avoid the risk of uterine perforation during curettage or biopsy.

5. In cyclical menorrhagic patients 60% will require some form of surgical intervention and only a minority (15%) will respond to hormonal therapy (OC or HRT).

6. In non-cyclical abnormal uterine bleeding patients: 1/3(29%) require some form of surgical intervention 1/3 will respond to hormonal therapy. 1/3 no treatment

7. Hysteroscopy is mandatory before instituting any form of modern endometrial ablative procedure e.g. uterine balloon therapy or microwave ablation.

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2. Valle R F (1983) Hysteroscopy for Gynaecologic Diagnosis. Clinical Obstetrics and Gynaecology 26: 267

3. Stock R F (1975) Prehysterectomy curettage: an evaluation. Obstet. Gynaecol 45 : 537

4. Wamsteker K (1977) Hysteroscopie. Thesis leiden, The Netherlands

5. Wamsteker K, Emanuel MH, S de Blok (1993). Hysteroscopy in Gynaecological Practice Organon's Magazine on Women & Health No. 2:27-29

6. Singapore cancer Society Yearbook (1993-1997) published 2000

The following are 2 guides written by me on the resection of the endometrium and submucous myomas. This is based on my personal operations of 82 TCRE (transcervical resection of endometrium), 20 TCRM (transcervical resection of myomas) and 27 TCRE/TCRM totalling 129 cases over a 6 year peroid from 1993.

My first presentation of 70 patients was done in Gleneagles Hospital in 1997. It compared well with the experiences of other colleagues.

Two protocols were then written on hysteroscopic management. The management protocol for hysteroscopy surgery was written as a guideline for the management of menorrhagia using hysteroscopic surgery and it was presented at the 7th World Congress of Endoscopic Surgery 2000. The "Hysteroscopic Resection procedure" was written at the request of fellow gynaecologists, Olympus endosurgery and Johnson & Johnson Gynecare for teaching purposes. Both protocols have been vetted by the Gynaecological Laparoscopic Societies of Hong Kong and Taiwan.

ENDOMETRIAL RESECTION COMPLICATIONS

Series	Maher & Hill (1990)	Magos et al (1991)	Pyper & Haeri (1991)	Shaxted	Holt	KW Lee (unpublished) (1997)
Number of patients	100	250	80	274	350	70
Uterine	1%	2%	4%	2.5%	1%	0%
Fluid overload (> 2L)	N/A	3%	0%	N/A	1%	2.8%
Haemorrhage	5%	0.4%	2.5%	N/A	4%	1.4%
Infection	2%	1%	N/A	1%	2%	0%
Haematometra	2%	1%	N/A	1.5%	8%	2.8%
Pregnancy	1%	1%	0%	0.6%	1%	0%

THE HYSTEROSCOPIC RESECTION PROCEDURE

The procedure of endometrial ablation with a combination of wire loop and roller ball is embarked upon; after ensuring optimum visual clarity, correct electrosurgical unit settings and fluid loss measurement system in place.

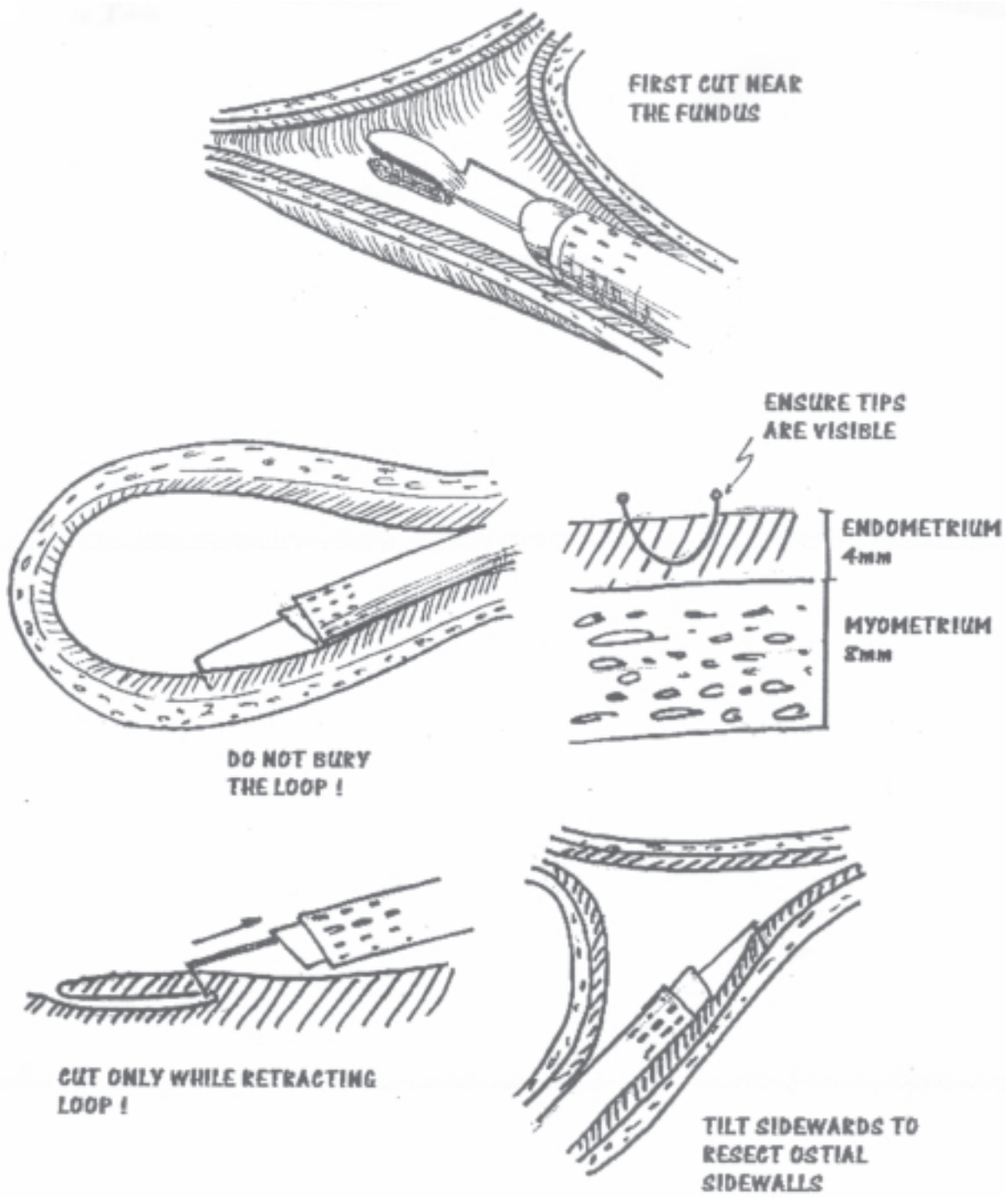
The loop has a width of 6mm and a depth 4.5mm. The electrosurgical unit is normally set at 50 to 80 watts of pure cutting current. The roller ball has a diameter of 3mm and is normally set also at 50 to 80 watts of pure coagulation mode. Only continuous flow resectoscopes are used.

UTERINE CAVITY DISTENSION

The fluid used is Glycine in 3-litre bags. Uterine distension is best achieved with an Uteromat *(Olympus)* or Hysteromat *(Storz)*, which pumps fluid into the uterine cavity at an adjustable flow rate and fluid pressure.

The usual setting of the fluid pressure is around 100 mmHg (Maximum 150 mmHg) and flow rate at 200 to 300 ml per minute. Basically, the fluid pressure and flow rate are set to achieve optimum uterine distension and clarity. The vascularity of the pathology, experience of the surgeon and personal preference will influence the choice of settings.

As an alternative, a pressure cuff set at less than 150mmHg can be applied over the Glycine bag or by hanging the Glycine bag about one meter above the chest of the patient. However, these are only feasible in simple cases otherwise, a lot of stress is placed on the OR personnel in checking and controlling the fluid pressure.



THE TECHNIQUE

The prepared endometrium is usually thin with a depth of 1-2mm. Cutting starts at the posterior wall, which is the easiest; from left to right or right to left in a clockwise or anti-clockwise direction. The first cut is made near the fundus to a depth of 3mm ensuring that the two ends of the wire loop are just visible.

Digging too deep, when the two ends of the wire loop are buried, may result in perforation or cutting too much into the uterine myometrium. Once the first cut is performed to the correct depth, the annular fibres of the myometrium can be seen and the endometrial thickness can be better gauged.

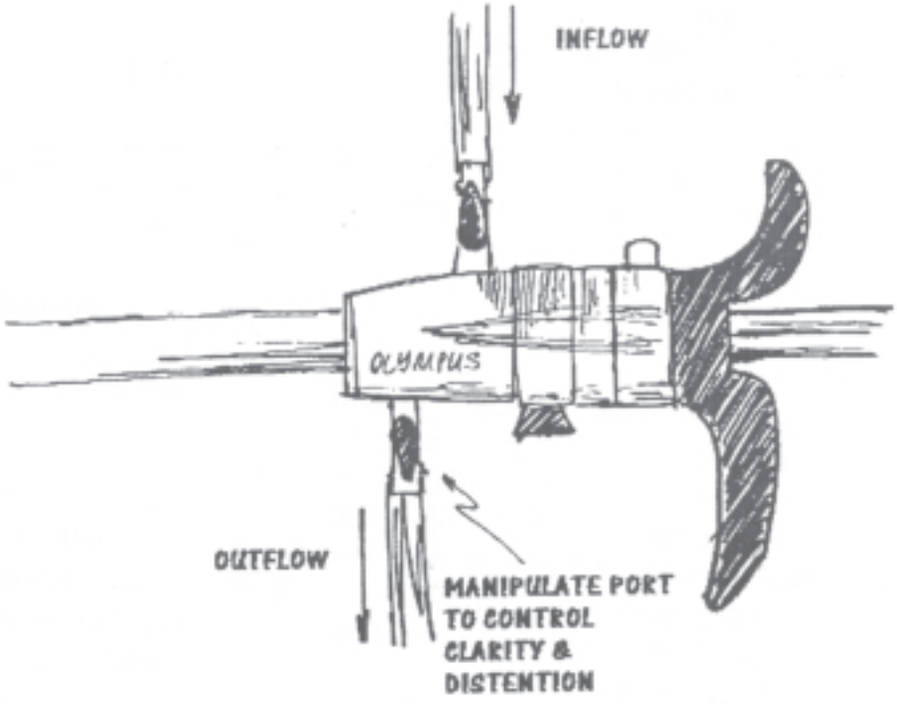
Resection is then continued clockwise or counterclockwise as one may wish to remove full thickness of the endometrium. Beginning on the posterior floor allows better visibility and easier hand-eye coordination for warming up or “feel”. Whereas beginning at the anterior wall has a disadvantage of chips dropping to the posterior wall (floor) thus covering the endometrium posteriorly.

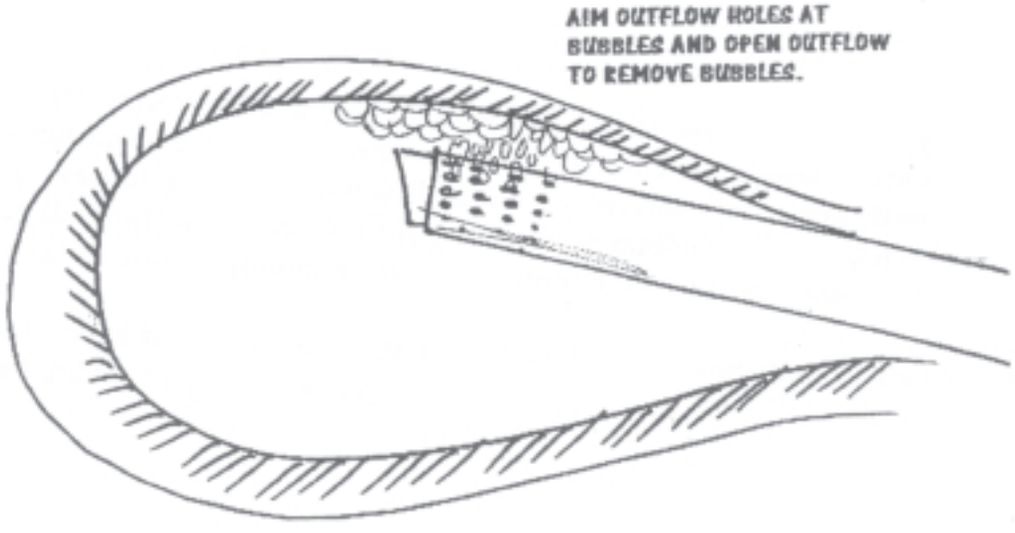
These chips will obscure view when resection reaches the posterior wall.

Furthermore, battling with bubbles at the anterior wall so early in the operation may be frustrating. Perforation is more likely to occur due to bubbles and poor visibility, forcing the operation to be abandoned quite early. On the other hand, the posterior wall is ergonomically easier to resect due to the design of the resectoscope.

Resection is done whilst the loop is pulled back into the scope and never cut with a forward motion! After the mid-cavity is completed, the whole procedure is repeated at the lower uterine segment up to near the internal os. Care is then taken to resect at the ostial region and the fundus, which is usually more difficult.

A sideward tilt of the loop is necessary to resect ostial sidewalls. The fundal area can be resected with the loop where possible. However, if difficulty is encountered in the ostial region of the fundus, then the roller ball should be used. The roller ball is normally used to cauterize the ostii and the fundus on coagulation mode. Care must be taken not to apply the roller ball longer than necessary over these areas to avoid perforation. Usually rolling or dabbing movements are advised. As a rule, the roller ball point should not be applied over a spot longer than 3 seconds. With experience, the roller ball can be used on “cutting’ mode to vaporize uneven areas, skipped areas and small submucous fibroids.





MAINTAINING VISION

When endometrial or fibroid chips obscure visual field, they can be removed by withdrawing the working element without removing the inner and outer sheaths. However, when chips are bulky, then the whole resectoscope is removed and the chips are removed with small polypus forceps or gentle blunt curettage. One must bear in mind that too many withdrawal of the resectoscope results not only in loss of momentum, trauma to the Endometrium and bleeding, but also a small risk of air bubble embolism on re-insertion of the resectoscope.

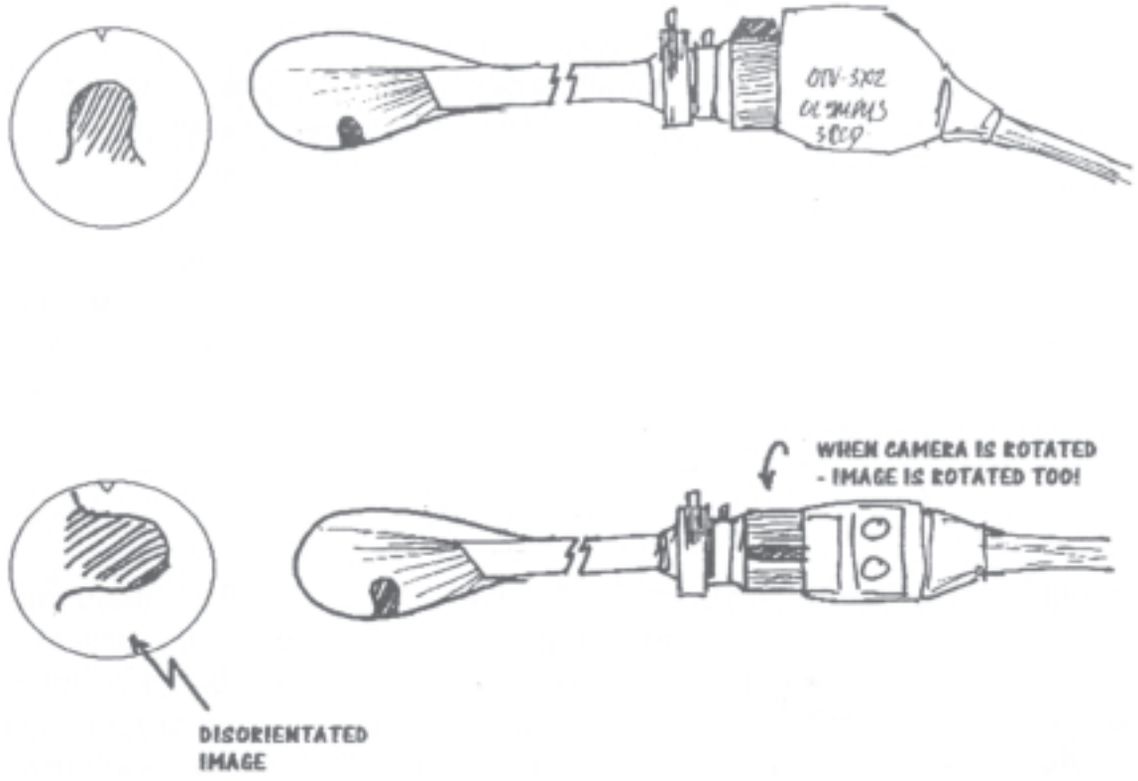
BLOODY VISION

Introduction of resectoscope should be facilitated by the insertion of the outer sheath with the obturator first after cervical dilatation to Hegar 9. Blood often obscures the vision once fluid is introduced into cavity. A few flushes of the cavity by opening and partially closing the outflow stopcock will suffice in clearing the view – the inflow port should be left fully open at all time. Occassionally, running the loop or roller ball with coagulation mode over the endometrial wall stops oozing and clears the visual field. Trying to focus the camera with blood in the uterine cavity is a problem; as such the resectoscopes circular edge seen on the TV monitor could be used as a focal reference.

BUBBLES

All bubbles in the inflow tube should be expelled before the resectoscope is inserted into the uterine cavity. However, small bubbles do appear during electrosurgical resection and they normally collect at the anterior endometrial wall. Opening the outflow stopcock fully sucks these bubbles into the outlet tubing, but this invariably drains away distension fluid and depletes fluid input rapidly.

My favourite trick is to adjust the degree of Trendelenberg position of the table until the bubbles migrate elsewhere.



ORIENTATION

Orientation of the camera and resectoscope is very important and it is easier if one sticks to a familiar set. Most camera heads are designed with the cable coming down at 6 o'clock position and this serves as a bearing. However, one should always orientate to the camera at hand before proceeding with any resection.

Some cameras (1 & 3CCD) have operational buttons located on the top of the camera head, which means they should always be facing superiorly. This technique is another reference point.

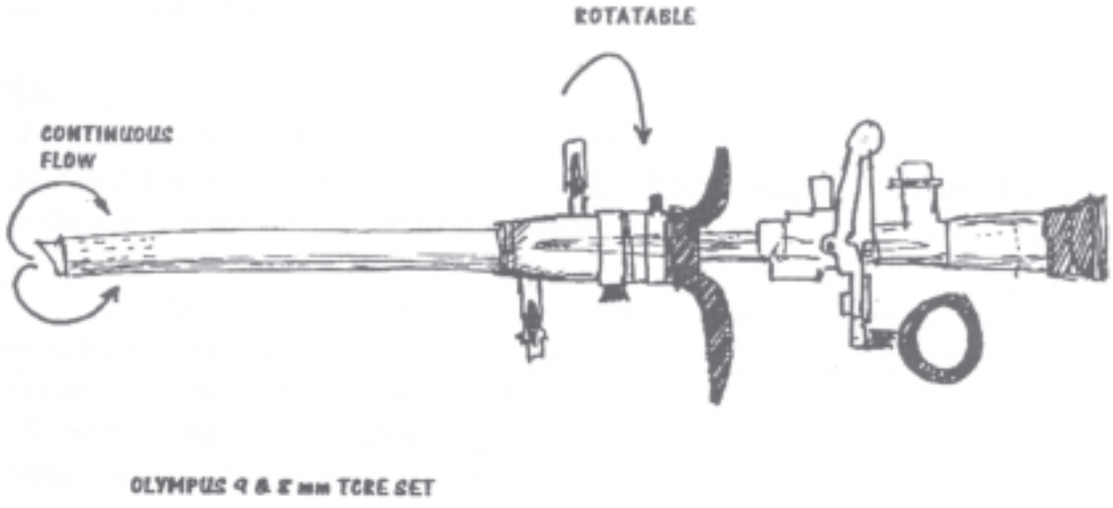
Orientation is important because the camera should be held in the correct position to correlate with the anterior and posterior wall of the endometrial cavity. Only the cutting moves clockwise or anti-clockwise.

FOCUS

It is important to have the whole circular visual field within the TV monitor. Fine focusing is done, by aiming at the objects in front of the scope. However, if initial visual field is obscured by blood or debris then focus can be made on the circular edge seen on the TV monitor. As the wire loop cuts and withdrawals towards the scope, the whole process should be visualized right to the point it recesses into the channel. Blind resection should be **avoided** and in fact **dangerous**.

The whole procedure should be **abandoned** under the following circumstances:

1. Visibility continues to be poor, i.e.bleeding
2. The object of resection is not in view
3. Wrong assessment of the size of the fibroid or wrong classification of the type of submucous fibroid e.g. a Type II instead of Type I.
4. Unaccountable fluid loss of more than 1500 ml.
5. Serum electrolyte changes
6. Oximetry changes e.g. when PaO2 falls below 96%



IMMEDIATE POST-OPERATIVE PERIOD

Uterine cavity should be checked for excessive bleeding and if in doubt, a small Foley's catheter should be inserted into the uterine cavity with the balloon inflated with fluid until resistance is felt (usually 10 to 20ml). This can be left for observation over 6 to 24 hours.

Bladder should be emptied to relieve the patient and urine output measured. The amount of fluid input and output should be accounted for before the patient leaves the operating room.

NB.
The above protocol is written based on a 9mm Olympus Resectoscope and the fluid medium is Glycine 1.5%. Adjustment has to be made for different models of resectoscope or fluid medium.

At the 2nd Asia-Pacific Congress on Advanced Gynaecologic Endoscopy-Hysteroscopy held in Taipei 19-20 May 2001 attended by Gynaecologists from Japan, Hong Kong, Taiwan and Singapore, the following consensus of opinion were made regarding Hysteroscopic resection using Electrosurgery:

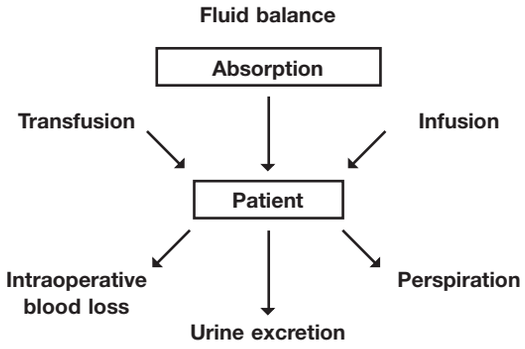
1. *The unaccountable fluid loss could be allowed up to 2,000ml*
2. *Dextrose 5% or even distilled water can be used by experienced surgeons.*
3. *The amount of infusion fluid should not exceed 10 Litre in majority of cases.*
4. *In normal circumstances the duration of resection should not exceed 1 hour.*
5. *Beginners should limit themselves to resecting submucous fibroids of Type 0 & 1. Size of fibroid should not exceed 3cm.*

ACKNOWLEDGEMENT

I would like to thank Dr Lee Chyi-Long, President of the Taiwan Association of O&G Endoscopists and Dr Yuen Pong Mo, President of the HK Gynaecological Endoscopy Society for their invaluable contribution to this protocol.

Management Protocol for Hysteroscopic surgery

1. FLUID BALANCE



2. DISTENSION IN OPERATIVE HYSTEROSCOPY

a. Gas

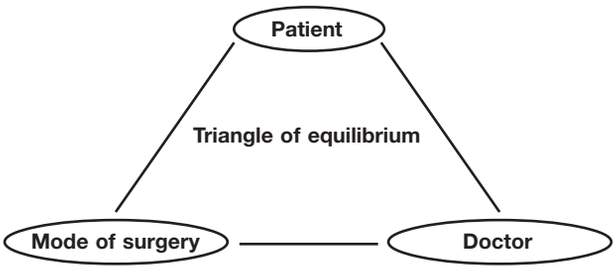
b. Fluids
   I. Electrolyte containing (Saline)
   II. Electrolyte free (Distilled water)
   III. High viscosity (Hyskon)
   IV. Low viscosity (Glycine)

2.1 The risk of problems which may result from absorption is dependent on the technical conditions and the pathophysiology.

Main factors – duration of surgery
– irrigation pressure
– wound size

2.2 Absorption ∝ Lymphatics
∝ veins
Amount ∝ intrautrine pressure
∝ duration of operation

Incidence of fluid absorption
1988-1991 AAGL 0.14 – 0.34%



3. PRE-OP ASSESSMNET

Patient selection:

– Menorrhagia – Failed medical treatment
– Against hysterectomy
– Benign endometrium
– Submucous fibroids

" Pain" may not be cured eg. Adenomysis

4. TIME PERMITS

a. Correct anaemia – haematinics

b. Prevent further bleeding
   – DANAZOL
   – GnRH
   Thins the endometrium and reduces operating time
   Allows Hb level to climb up

c. Schedule operation – elective date preferred when Hb > 10gm
   – usually blood transfusion is avoidable

5. TIME CONSTRAINT

a. Clinically fit for minor surgery

Mild anaemia and not bleeding
– One sitting → diagnostic hysteroscopy then KIV 'thermal-balloon'

b. Patient fit for resective surgery-diagnostic hysteroscopy – Assess suitability for surgery

1st half of cycle –
Transcervical resection of endometium (TCRE)
Transcervical resection myoma (TCRM)

2nd half of cycle –
D & C first to thin the endometrium then TCRE

c. If in doubt about suitability of resective surgery → DECLINE

Offer – elective date
– Drugs
– MIRENA (IUCD (LNG-IUS))

6. HYSTEROSCOPY – MANDATORY

a. Cavity – Depth < 9 cm
Small cavity = shorter op time
= ↓ risk of fluid overload

b. Regularity of cavity
irregular cavity → tends to suffer from endometrial lining avulsion or perforation on insertion of the hysteroscope

c. Submucous fibroids
Number, Size, Type O or I
Operability ∝ judgement
∝ competence
∝ speed

d. Ultrasound assessment – not as reliable compared to Hysteroscopy

e. Plan for cervical dilatation for the larger hysteroresectoscope helps to prevent trauma & bleeding to Cervix.

7. OPERATING THEATRE

Essence on speed and coordination

a. Work with a regular team of anaesthetists and OT nurses
– blood gas or electroyte machine in OT is an advantage
– nurses trained in hysteroscopic surgery / TURP – preferred

b. Fluid input and output chart on paper and surgeons' "mind"
Account for fluid loss – floor, bucket/basin, peritoneum

c. Resectoscope – "continuous flow" design outlet stop-cork → remains open or partially open but never close

d. Uteromat/Hysteromat for pumping fluid in at a desired pressure (< 150 mmHg) and flow rate (200-300 m/s/min)
Without Uteromat –
maintain fluid pressure to just enough to distend the cavity optimally and allowing a clear and bloodless visual field. Eg. Hang the fluid bag/bottle ablout 1 metre above the patient's heart.

e. Use bigger bags of fluid e.g. glycine in 3 litre bags. Small bags require frequent changing and stoppages which in turn interferes with the momentum of surgery

f. 3 Bags Rule (3 × 3 L glycine)
most TCRE/TCRM are done with less than 3 bags

Surgery should be past half way point by the second bag

g. Speed
majority of cases are completed around 30 minutes from the first cut

speed can be reduced with training, guidance and endometrial thinning

h. Cutting loop or Roller ball?
Don't be bias
Use both to your advantage

i. Reduce bleeding in the operative field
– endometrial thinning
– diathermise visible bleeding vessels before resecting
– Judicious use of inflow fluid pressure
– pitressin injection around base of fibroid

j Fluid output/loss
a. Measuring jar/bucket

b. Estimate loss on floor and drapes

c. Petitoneal cavity – especially with patent fallopian tubes

d. Indwelling bladder catheter if duration of surgery is long

e. Consider prophylactic frusemide (Lasix) during second bag of 3 L glycine

f. Fluid loss – unaccountable
1000ml – sodium level control
Hyponatraemia – stop surgery
1500ml – stop surgery soon.
2000ml – Must stop

8. POST OPERATIVE PERIOD

a. Account for fluid intake and ouput

b. If bleeding is seen from the cervix to be active → insert a Foley's balloon into the Uterine cavity

9. SIGNS OF FLUID OVERLOAD

a. Neurological disturbances
– giddiness, disorientation
– coma
Only realise when reversing the anaesthesia

b. Lungs – crepitations
Abdomen – peritoneal distension
Oedema – face, chest

c. Anaesthetic monitor changes
↓ PaO_2

d. Bradycardia, blood pressure changes

10. TRAETMENT OF FLUID OVERLOAD SYNDROME

a. Bladder catheter

b. I/V frusemide 10 – 20mg or more in severe cases

c. Central venous catheter

d. 20 – 40ml 20% NaC1 over 1-2 hours repeat control of sodium level substitution when sodium < 130mmo 1/litre