Università degli Studi di Padova
Dipartimento di Scienze Ginecologiche e della Riproduzione Umana
Scuola di Specializzazione in Ginecologia e Ostetricia
Direttore Prof. Giovanni Battista Nardelli

Hysteroscopic morcellator: a new perspective in endoscopy

Dott. Emanuele Ancona

The American College of Obstetricians and Gynecologists
WOMEN'S HEALTH CARE PHYSICIANS

PRACTICE BULLETIN

CLINICAL MANAGEMENT GUIDELINES FOR OBSTETRICIAN–GYNECOLOGISTS

NUMBER 128, JULY 2012

Diagnosis of Abnormal Uterine Bleeding in Reproductive-Aged Women

"Menstrual flow outside of normal volume, duration, regularity, or frequency is considered abnormal uterine bleeding" (AUB).

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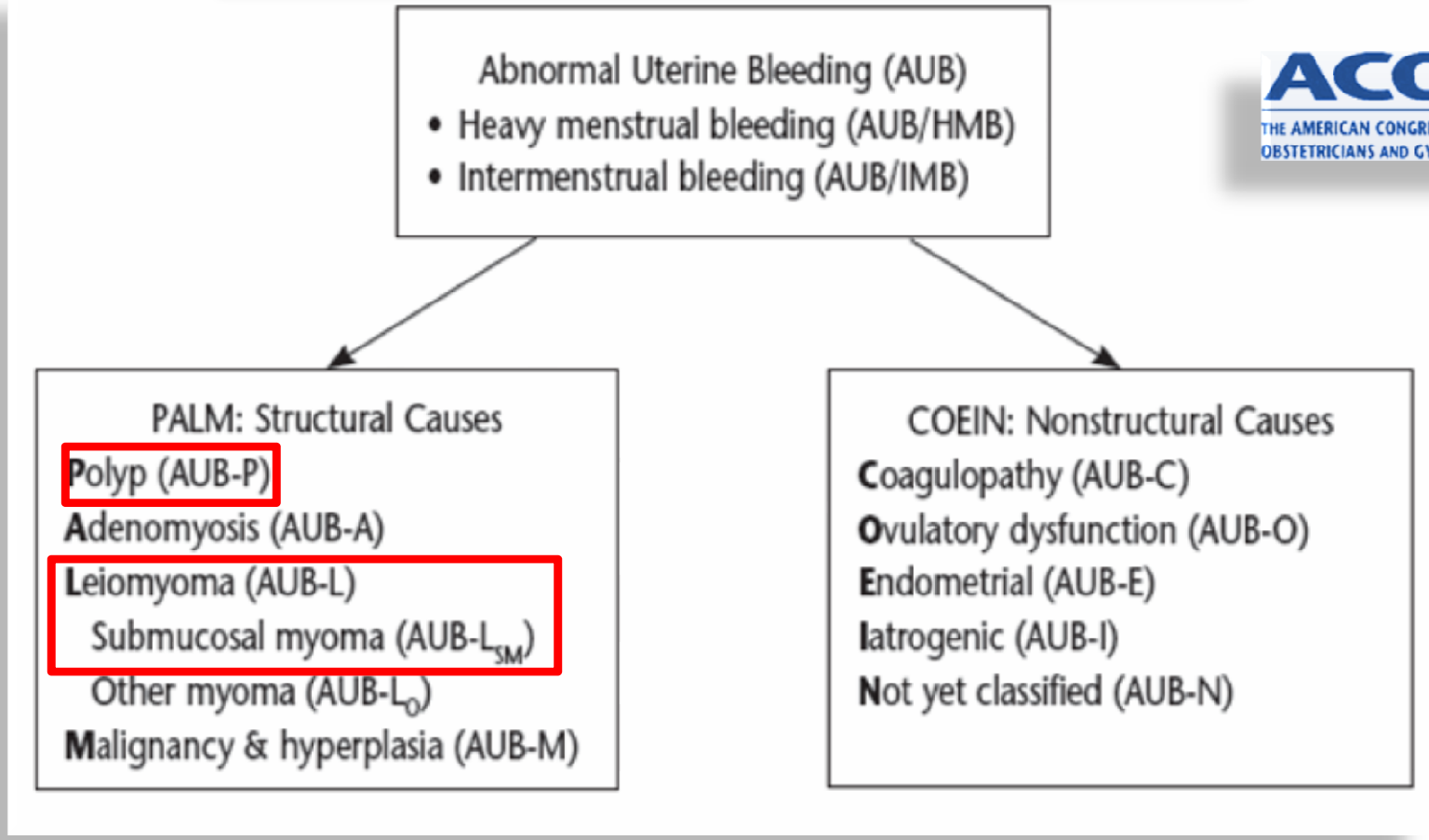
Committee on Practice Bulletins—Gynecology. Practice bulletin no. 128: diagnosis of abnormal uterine bleeding in reproductive-aged women. Obstet Gynecol. 2012 Jul;120(1):197-206.

PALM–COEIN classification



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Munro MG FIGO classification system (PALM-COEIN) for causes of abnormal uterine bleeding in nongravid women of reproductive age. Int J Gynaecol Obstet. 2011 Apr;113(1):3-13.

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Diagnostic Evaluation of Abnormal Uterine Bleeding

Medical History
- Age of menarche and menopause
- Menstrual bleeding patterns
- Severity of bleeding (clots or flooding)
- Pain (severity and treatment)
- Medical conditions
- Surgical history
- Use of medications
- Symptoms and signs of possible hemostatic disorder

Physical Examination
- General physical
- Pelvic Examination

—External
—Speculum with Pap test, if needed*
—Bimanual

Laboratory Tests
- Pregnancy test (blood or urine)
- Complete blood count
- Targeted screening for bleeding disorders (when indicated)†
- Thyroid-stimulating hormone level
- *Chlamydia trachomatis*

Available Diagnostic or Imaging Tests (when indicated)
- **Saline infusion sonohysterography**
- **Transvaginal ultrasonography**
- Magnetic resonance imaging
- **Hysteroscopy**

Available Tissue Sampling Methods (when indicated)
- Office endometrial biopsy
- Hysteroscopy directed endometrial sampling (office or operating room)

Committee on Practice Bulletins—Gynecology. Practice bulletin no. 128: diagnosis of abnormal uterine bleeding in reproductive-aged women. Obstet Gynecol. 2012 Jul;120(1):197-206.

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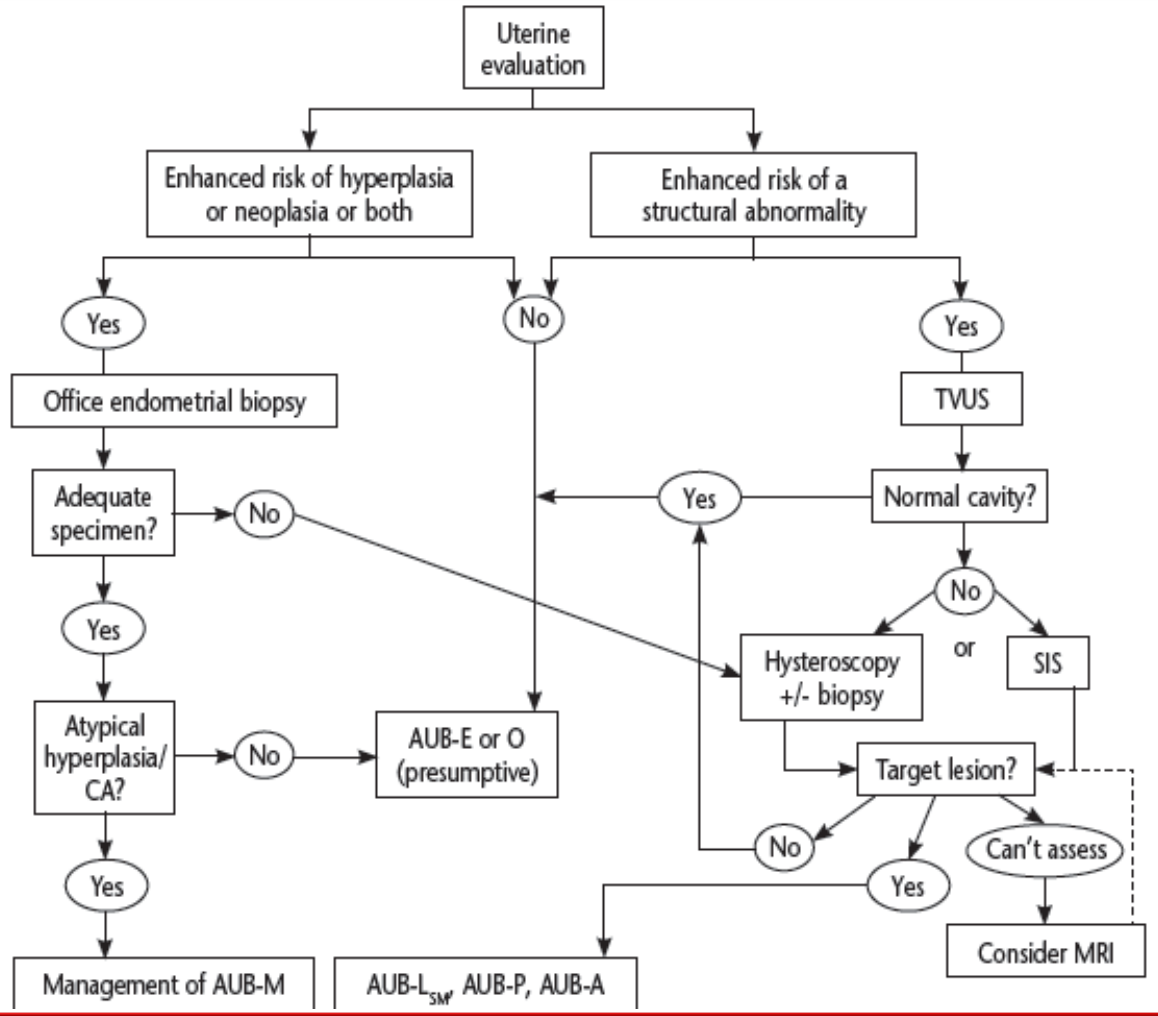
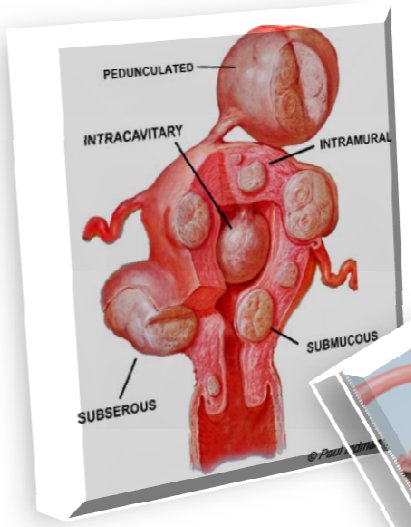
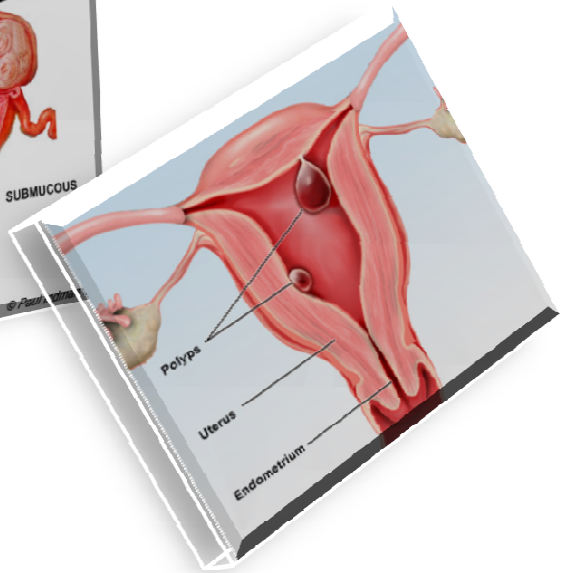
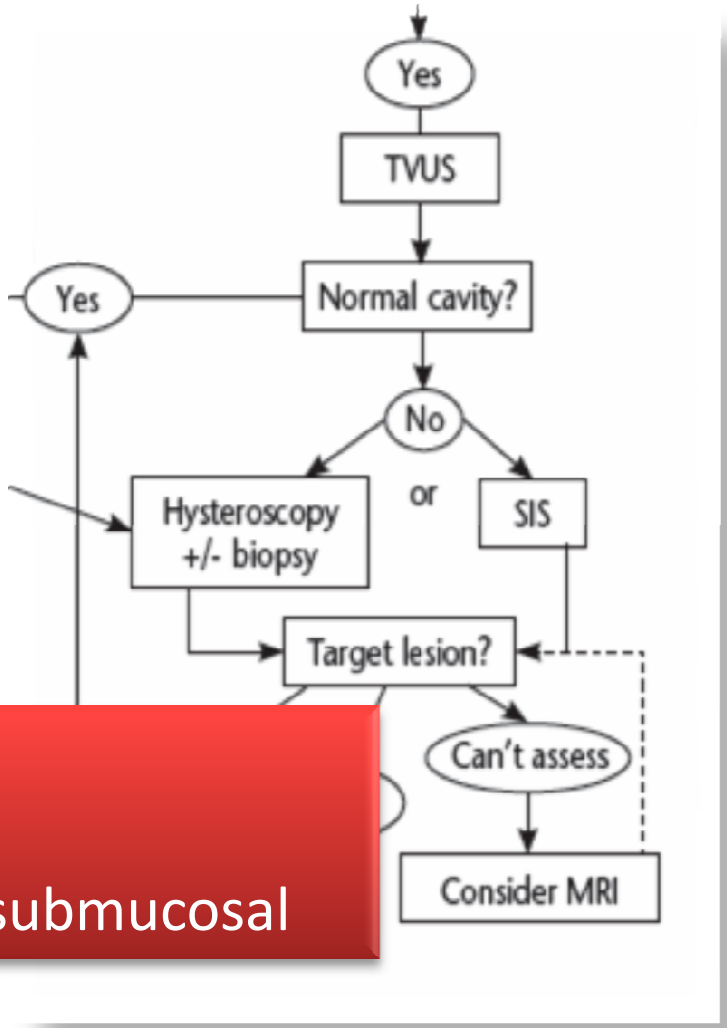
Managment of Abnormal Uterine Bleeding



Committee on Practice Bulletins—Gynecology. Practice bulletin no. 128: diagnosis of abnormal uterine bleeding in reproductive-aged women. Obstet Gynecol. 2012 Jul;120(1):197-206.







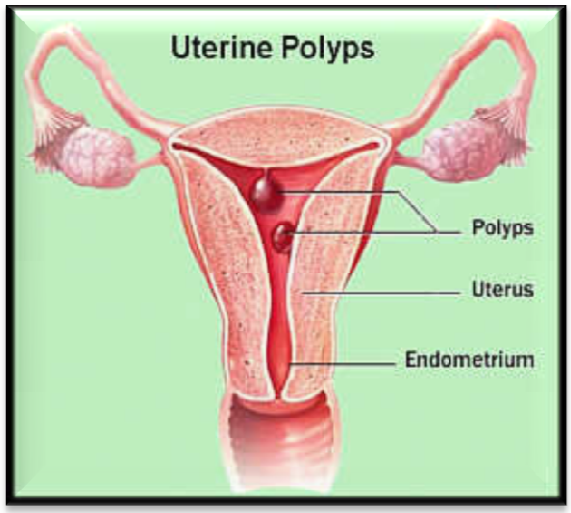
AUB-P, polyp;
AUB-A, adenomyosis;
AUB-LSM, leiomyoma submucosal

Committee on Practice Bulletins—Gynecology. Practice bulletin no. 128: diagnosis of abnormal uterine bleeding in reproductive-aged women. Obstet Gynecol. 2012 Jul;120(1):197-206.

Endometrial polyps

Hyperplastic overgrowths of endometrial glands and stroma that form a projection from the surface of the endometrium

The great majority of endometrial polyps are benign, but malignancy occurs in some women



Lieng M Treatment of endometrial polyps: a systematic review. Acta Obstet Gynecol Scand 2010; 89:992.
Lee SC The oncogenic potential of endometrial polyps: a systematic review and meta-analysis. Obstet Gynecol 2010; 116:1197.

Prevalence of endometrial polyps ranges from **7.8% to 34.9%,** depending on the definition of a polyp, diagnostic method used, and the population studied

Prevalence of polyps increase with age, more postmenopausal (11.8%) than premenopausal women (5.8%) are affected.

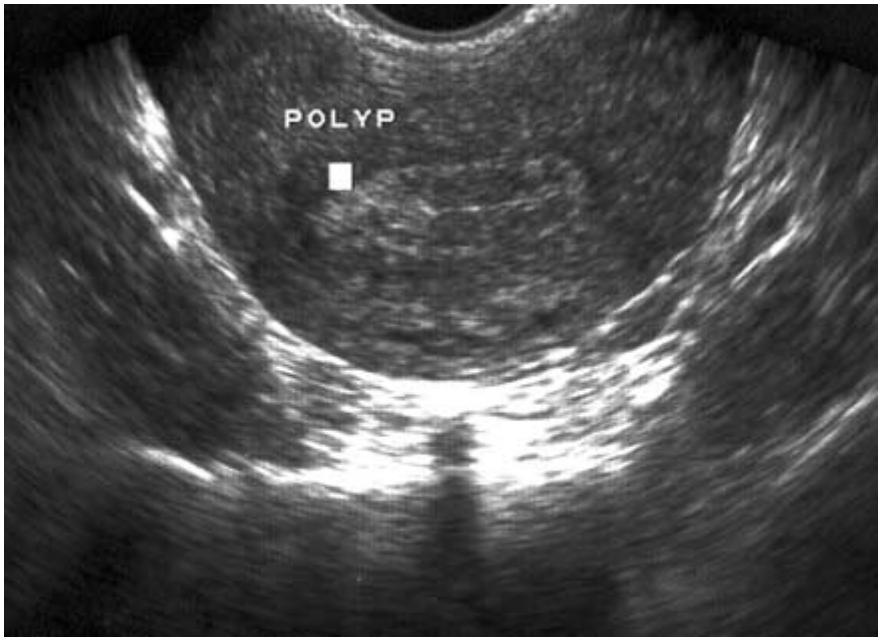
Haimov-Kochman The natural course of endometrial polyps: Could they vanish when left untreated? Fertil Steril. 2009;92:828.e11–828.e12.
Dreisler E Prevalence of endometrial polyps and abnormal uterine bleeding in a Danish population aged 20-74 years. Ultrasound Obstet Gynecol. 2009;33:102–108.
Fabres C Comparison of ultrasonography and hysteroscopy in the diagnosis of intrauterine lesions in infertile women. J Am Assoc Gynecol Laparosc. 1998;5:375–378.
Anastasiadis Endometrial polyps: prevalence, detection, and malignant potential in women with abnormal uterine bleeding. Eur J Gynaecol Oncol. 2000;21:180–183.

Method [references]	Total number of patients included in studies	Sensitivity Median (range)	Specificity Median (range)	PPV Median (range)	NPV Median (range)	Advantages	Disadvantages
TVUS [18,58–64]	1807	91% (19%–100%)	90% (53%–100%)	86% (70%–100%)	90% (87%–97%)	Readily available Safe Noninvasive Reproducible	Not specific for endometrial polyp

Se 91%

Sp 90%

TVUS



Hyperechoic lesion with
regular contours within the uterine lumen, outlining the endometrial walls on which it rests, surrounded by a thin hyperechoic halo.

Cystic spaces corresponding to dilated glands filled with proteinaceous fluid may be seen within the polyp

Polyp may appear as a nonspecific endometrial thickening or focal mass within the endometrial cavity.

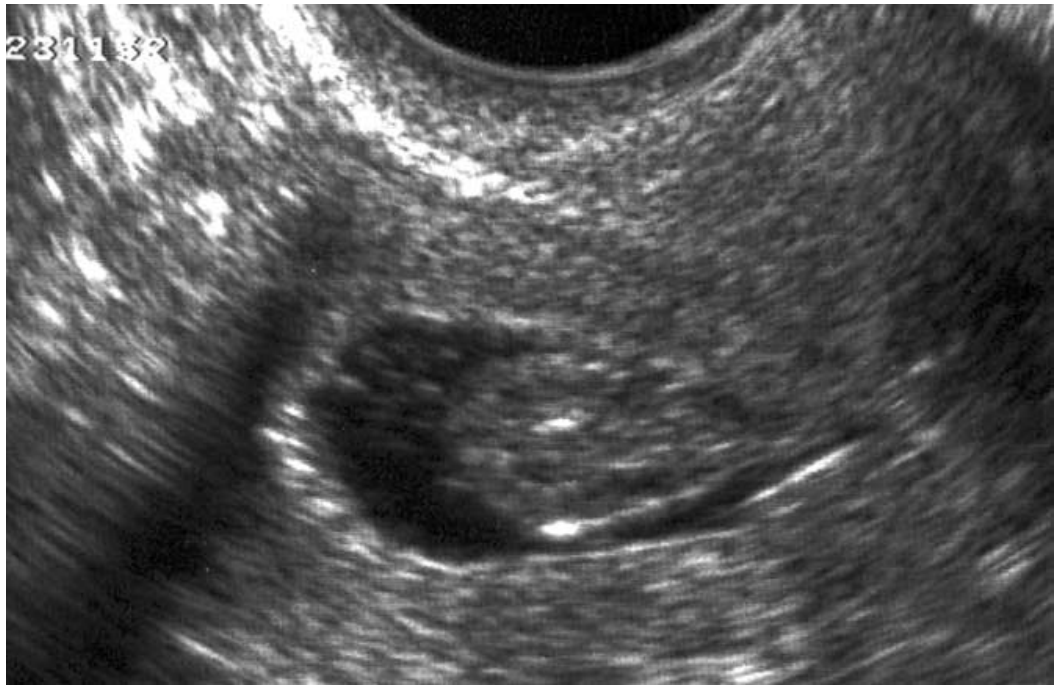
Salim S Diagnosis and management of endometrial polyps: a critical review of the literature. J Minim Invasive Gynecol. 2011 Sep-Oct;18(5):569-81.

SIS [37,56,58,59,62, 64–70]	1354	95% (58%–100%)	92% (35%–100%)	95% (70%–100%)	94% (83%–100%)

Se 95%

Se 91%

SIS



Accuracy comparable to hysteroscopy	Does not allow histologic diagnosis
Easier to learn than hysteroscopy	Higher skill requirement than TVUS
	Patient discomfort from fluid leakage and pain from balloon catheter

Salim S Diagnosis and management of endometrial polyps: a critical review of the literature. J Minim Invasive Gynecol. 2011 Sep-Oct;18(5):569-81.

Diagnostic hysteroscopy

Diagnostic hysteroscopy [18,60,62,72,75–77]	5261	90% (58%–99%)	93% (87%–100%)	96% (21%–100%)	93% (66%–99%)

Se 90%

Sp 93%

Higher accuracy than other imaging modalities

Allows potential endometrial sampling and removal of polyp

Invasive

Higher complication rate than other imaging modalities

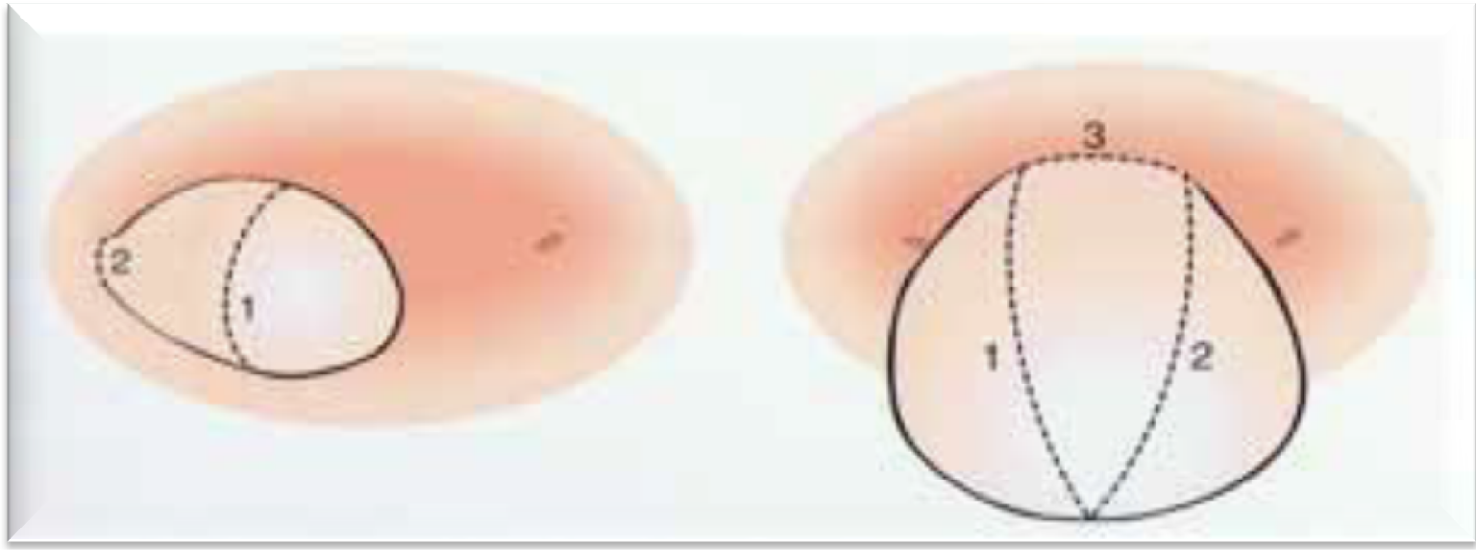
High skills by operator required

May require anesthesia and hospitalization

Newer instruments allow outpatient operative hysteroscopy with reduced cost and same clinical outcomes

Salim S Diagnosis and management of endometrial polyps: a critical review of the literature. J Minim Invasive Gynecol. 2011 Sep-Oct;18(5):569-81.

Hysteroscopic polypectomy [102,104,109,114–119]	Accurate, complete resection of polyp Early recovery, return to normal activities Minimal hospitalization Low risk of complication (0.38%) Associated with good reproductive outcome Low risk of intrauterine adhesions with operative hysteroscopy for polyps	Increased operating time for operative hysteroscopy Specialized equipment Glycine absorption and associated complications a potential issue Higher skill requirement than blind technique	Operative hysteroscope use is associated with a low recurrence rate 0% to 4.5%
Hysteroscopy and bipolar removal of polyp [28,122]	Easy to use No glycine for distension	Expensive Not widely available	Not yet reported

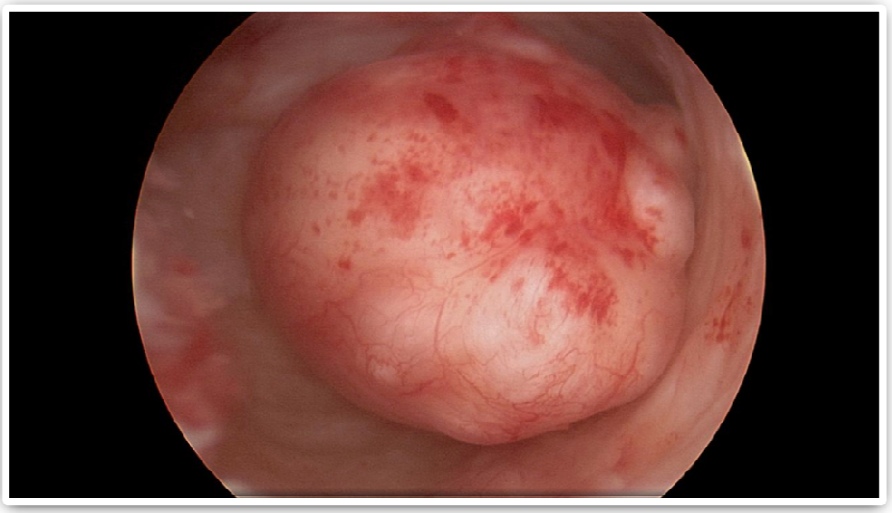


Salim S Diagnosis and management of endometrial polyps: a critical review of the literature. J Minim Invasive Gynecol. 2011 Sep-Oct;18(5):569-81.

Myomas

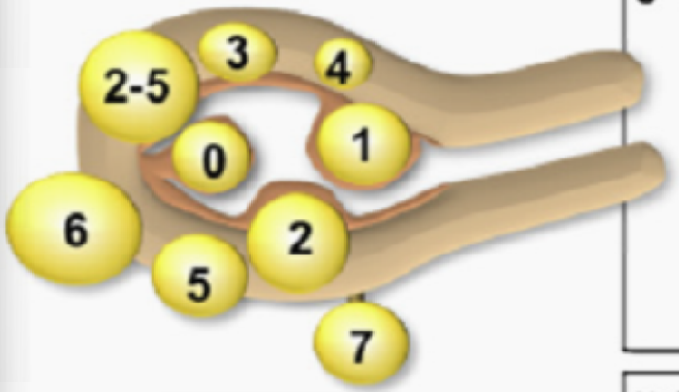
Uterine leiomyomas (fibroids or myomas) are the most common pelvic tumor in women.

Benign monoclonal tumors arising from the smooth muscle cells of the myometrium.



Baird High cumulative incidence of uterine leiomyoma in black and white women: ultrasound evidence. Am J Obstet Gynecol 2003; 188:100.
Buttram Uerine leiomyomata: etiology, symptomatology, and management. Fertil Steril 1981; 36:433.
Serden Treatment of abnormal uterine bleeding with the gynecologic resectoscope. J Reprod Med 1991; 36:697.

Leiomyoma Subclassification System



FIGO

SM- Submucosal	0	Pedunculated Intracavitary
	1	<50% Intramural
	2	≥50% Intramural
O - Other	3	Contacts endometrium; 100% Intramural
	4	Intramural
	5	Subserosal ≥50% Intramural
	6	Subserosal <50% Intramural
	7	Subserosal Pedunculated
	8	Other (specify e.g. cervical, parasitic)

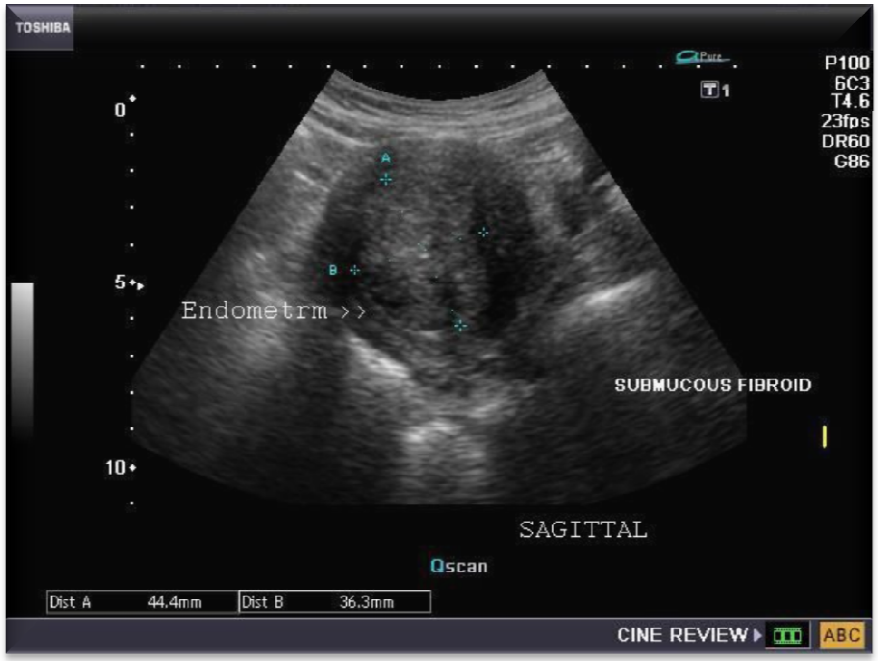
Hybrid Leiomyomas (impact both endometrium and serosa)	Two numbers are listed separated by a hyphen. By convention, the first refers to the relationship with the endometrium while the second refers to the relationship to the serosa. One example is below	
	2-5	Submucosal and subserosal, each with less than half the diameter in the endometrial and peritoneal cavities, respectively.

AAGL practice report: practice guidelines for the diagnosis and management of submucous leiomyomas. J Minim Invasive Gynecol. 2012 Mar-Apr;19(2):152-71.

Echogenicity depends on muscular or fibrous component

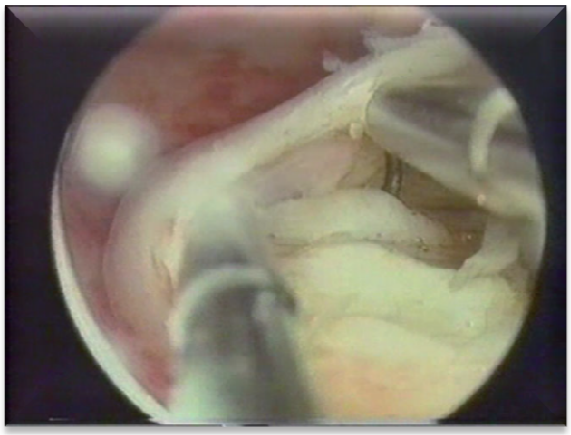
Muscular myoma: hypoechogenic, small, easy to differentiate from the surronding tissue

Fibrous myoma: highter echogenicity



Fibroids completely within the uterine cavity (G0)

Resectoscopic excision by slicing
Repeated and progressive passages of the cutting loop (loop carried beyond the neoformation,cutting only taking place during the backward or return movement of the loop)



No histology!

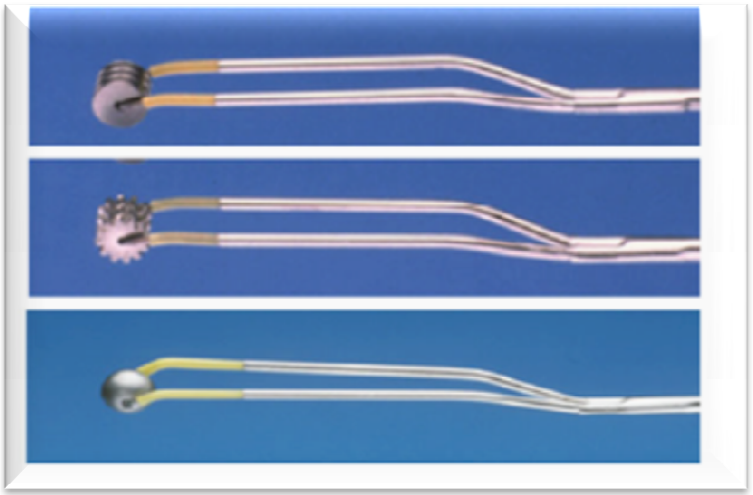
Ablation by Nd:YAG laser (Neodymium-doped yttrium aluminum garnet, YAG)
Fibroids 2 cm or less in diameter: first coagulates the surface vessels with the defocused laser fibre. Then the fibre is dragged repetitiously over the fibroid until it is flattened

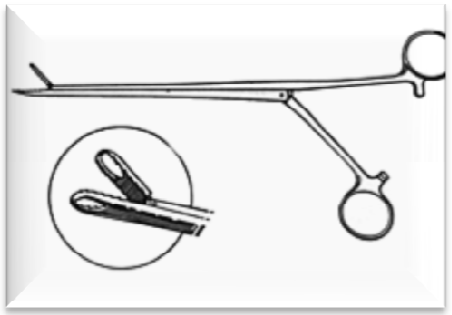
Di Spiezio Sardo Hysteroscopic myomectomy: a comprehensive review of surgical techniques. Hum Reprod Update. 2008 Mar-Apr;14(2):101-19. Epub 2007 Dec 6. Review

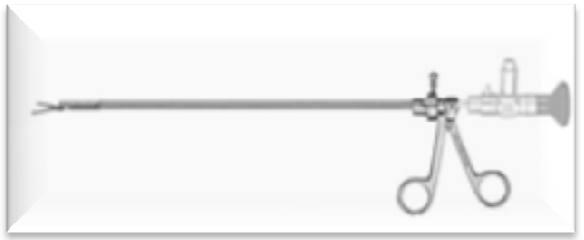
No histology!

Vaporization of fibroid

Using spherical or cylindrical electrodes: electrode is dragged along the surface of the fibroid until the nodule is reduced to a size compatible with removal by the means of Corson forceps or Isaacson optical tenaculum.







Di Spiezio Sardo Hysteroscopic myomectomy: a comprehensive review of surgical techniques. Hum Reprod Update. 2008 Mar-Apr;14(2):101-19. Epub 2007 Dec 6. Review

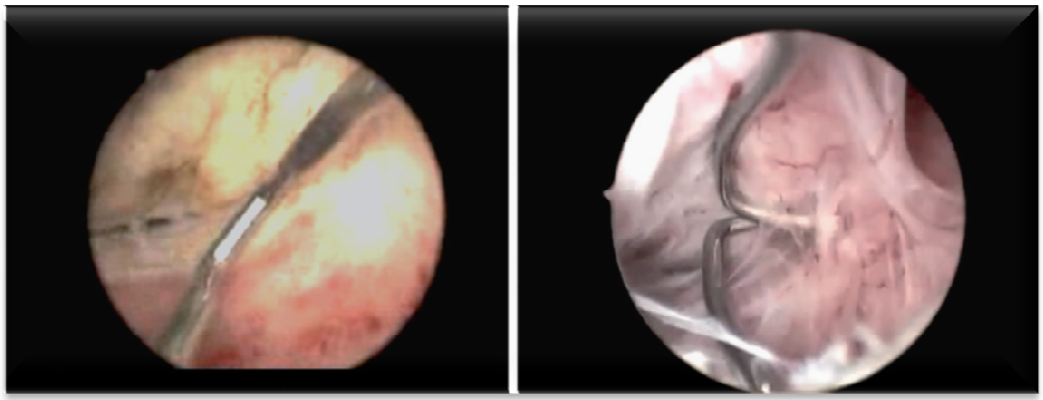
Fibroids with intramural development (G1-G2)

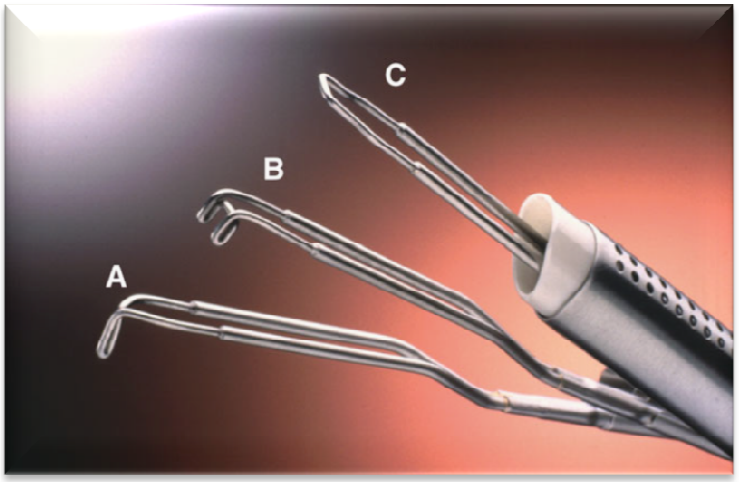
'Cold loop' myomectomy (Mazzon)

(i) Excision of the intracavitary component of the fibroid (Slicing)

(ii) Enucleation of the intramural component of the fibroid (Cold loop)

(iii) Excision of the intramural component





Intravasation syndrome

Electrosurgery devices using monopolar current cannot be used with electrolyte-containing irrigation fluids (eg, isotonic saline or lactated Ringer's).

Non-conductive (ie, non-electrolyte) solutions have been employed.

- 1.5 percent glycine (most commonly used)
- 3 percent sorbitol
- 5 percent mannitol

Fluid absorbed into the vascular space (intravasation) rapidly **lowers the serum sodium**.

(Fluid enters the vascular space directly through vessels opened during the procedure).

Hyponatremia

Acute hypoosmolality is associated with acute cerebral edema due to a water shift into the brain from the hypotonic extracellular fluid.

Nausea

1000 mL

Confusion
Disorientation
Twitching
Seizures
Hypotension

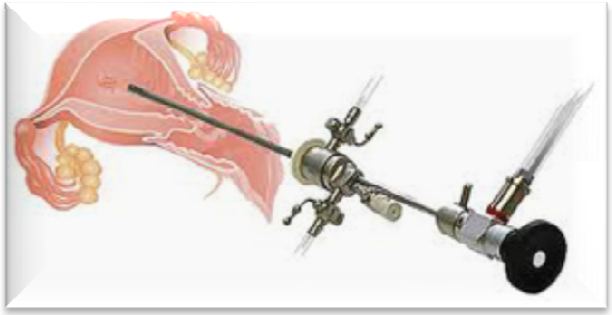
2000-3000 mL

transient visual abnormalities (decreased visual acuity or blurred vision)

Uterine perforation

1 %of operative procedures

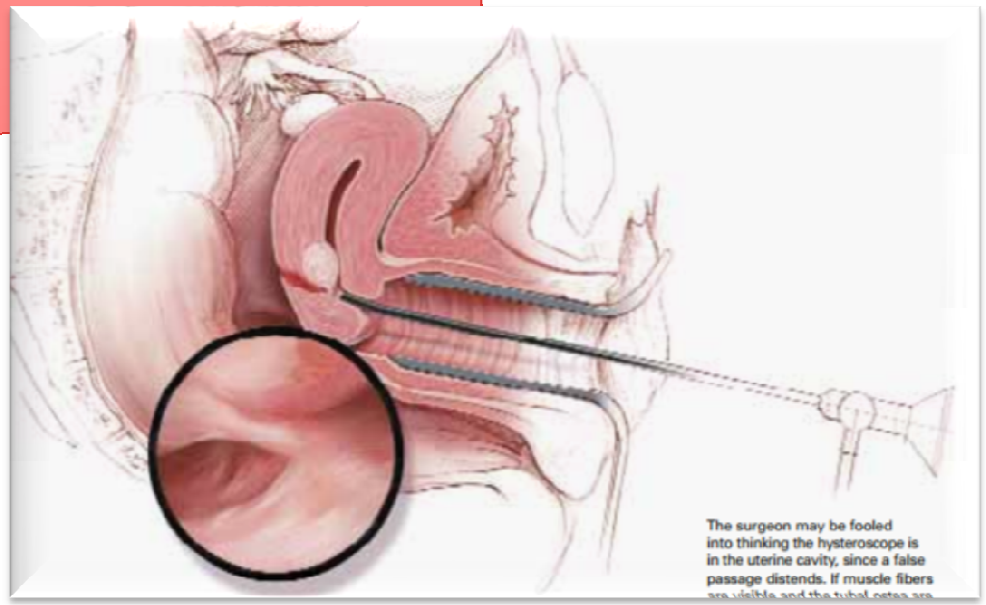
Risk factors
- Cervical stenosis
- Distortion or scarring of the endocervical canal (cone biopsy)
- Uterine malposition (eg, extreme retroversion or retroflexion)
- Distortion of uterine anatomy (fibroids, intrauterine adhesions)
- Menopausal endometrial atrophy and myometrial thinning
- Menopausal vaginal atrophy and stenosis



Diagnosis
•Excessive bleeding
•Sudden loss of visualization or uterine distension
•Abrupt increase in the distending fluid deficit

Direct visualization of:
•A hole in the uterine wall
•Omentum or bowel

Hysteroscopic view of perforation at the fundus. The small bowel is visible beyond the perforation at left.



The surgeon may be fooled into thinking the hysteroscope is in the uterine cavity, since a false passage distends. If muscle fibers

Post-procedure clinical manifestations

- Severe or persistent pelvic or abdominal pain
- Abdominal distension
- Heavy or persistent vaginal bleeding
- Hypotension
- Hematuria
- Fever

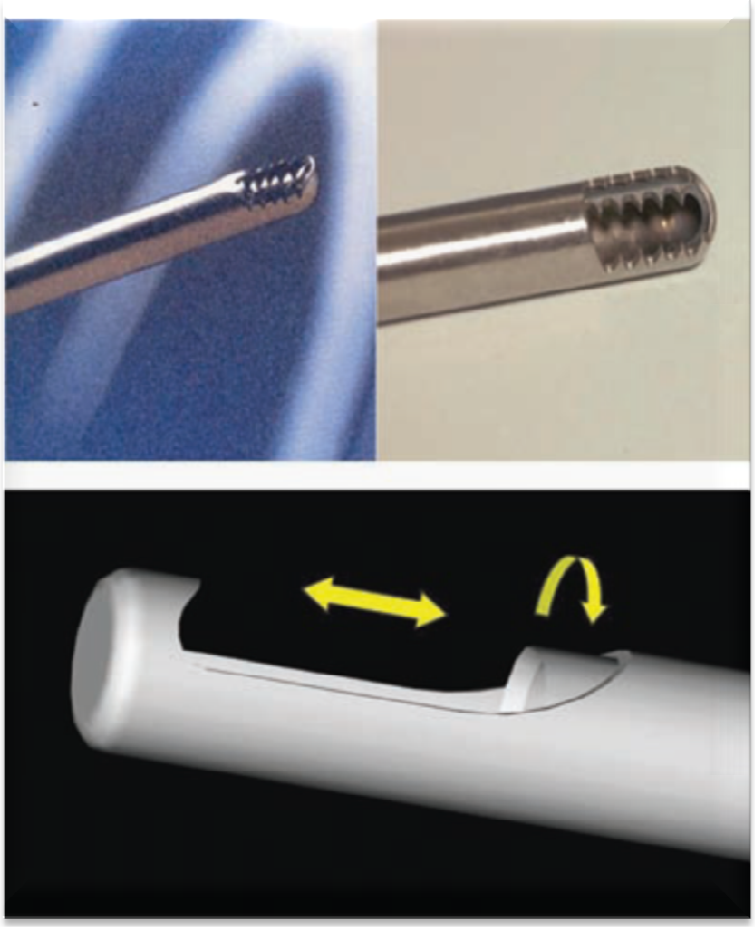
Journal of Minimally Invasive Gynecology (2005) 12, 62-66

THE JOURNAL OF
MINIMALLY INVASIVE
GYNECOLOGY

The Intra Uterine Morcellator: A new hysteroscopic operating technique to remove intrauterine polyps and myomas

Mark Hans Emanuel, MD, PhD, and Kees Wamsteker, MD, PhD

Emanuel MH The Intra Uterine Morcellator: a new hysteroscopic operating technique to remove intrauterine polyps and myomas. J Minim Invasive Gynecol. 2005 Jan-Feb;12(1):62-6.



Single-use rigid metal inner tube with cutting edges that rotate and/or reciprocate within a 4-mm rigid metal outer tube.

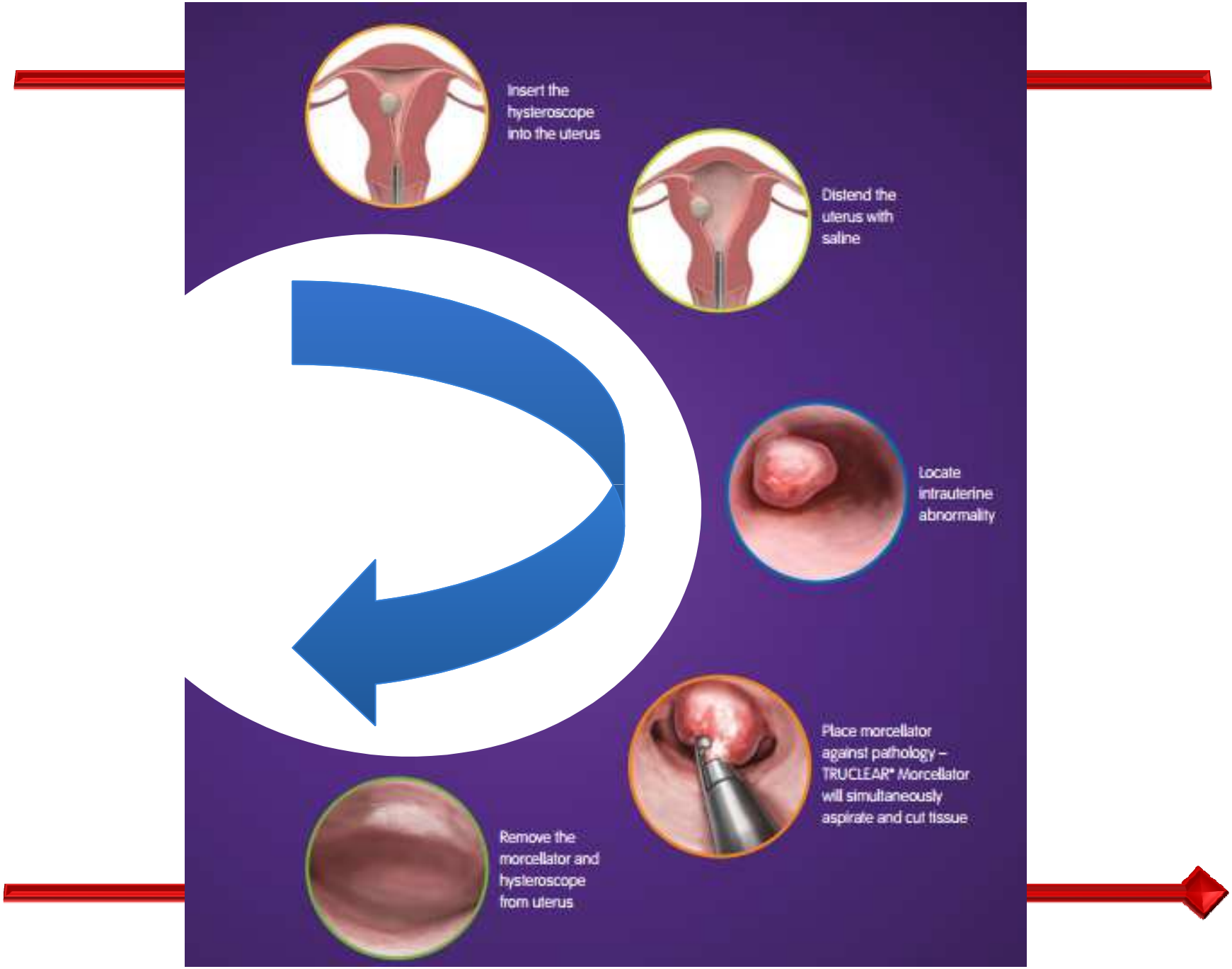
The outer tube incorporates a side-facing cutting window at its distal end.

The blade assembly is secured to a reusable hand piece to which a suction tube is attached.

Suction is applied to the inner tube and tissue is then pulled into the cutting window as the inner tube rotates

The resected tissue is aspirated through the device into a collecting pouch (histopathologic analysis).

Emanuel MH The Intra Uterine Morcellator: a new hysteroscopic operating technique to remove intrauterine polyps and myomas. J Minim Invasive Gynecol. 2005 Jan-Feb;12(1):62-6.


Insert the hysteroscope into the uterus
Distend the uterus with saline
Locate intrauterine abnormality
Place morcellator against pathology – TRUCLEAR® Morcellator will simultaneously aspirate and cut tissue
Remove the morcellator and hysteroscope from uterus

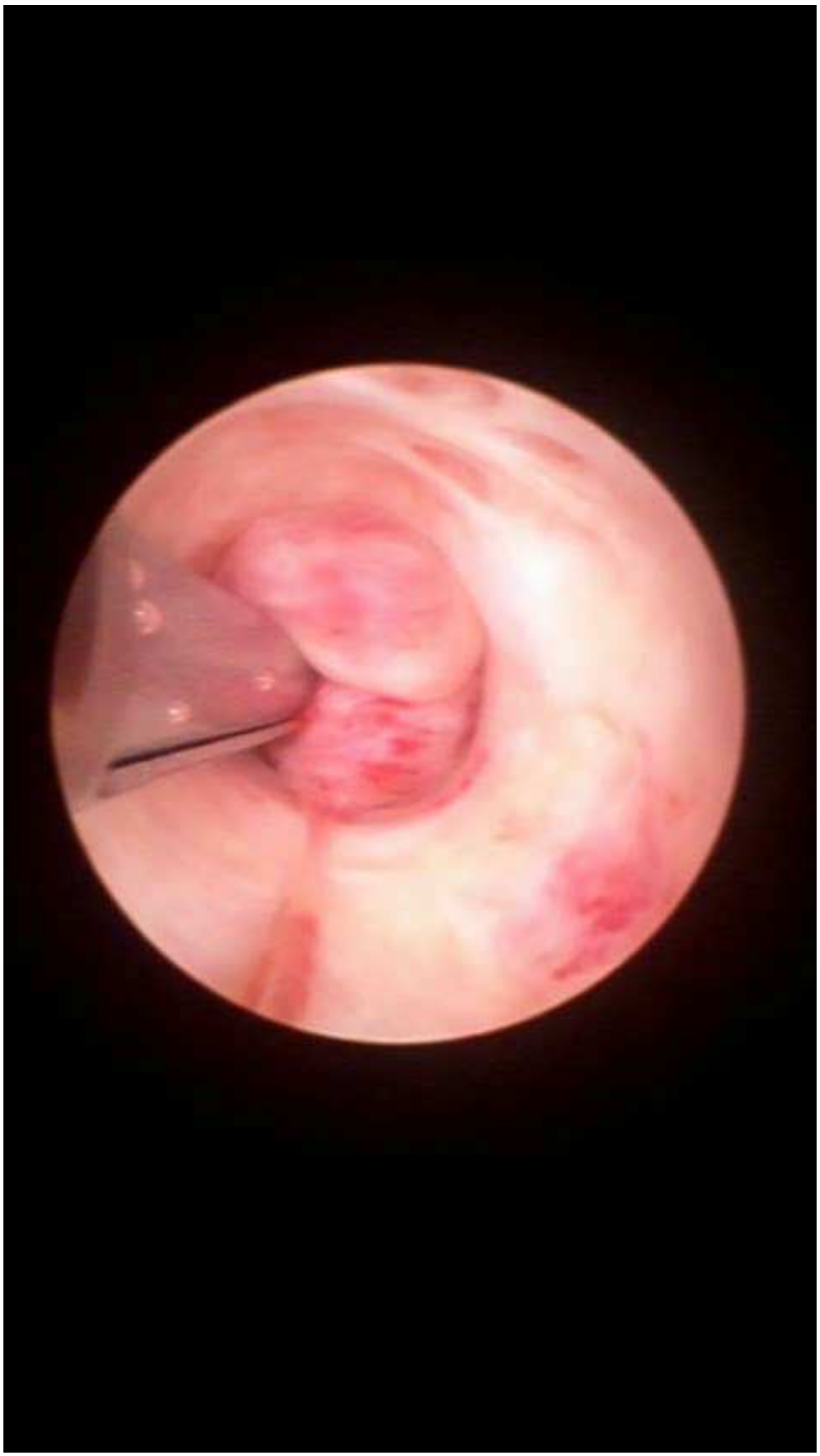


Table 2 Comparison of outcomes for operating time and fluid loss deficit between resection and the IUM technique

Pathology technique	Polyps resection	Polyps IUM	Myomas all resection	Myomas all IUM
No. of procedures	44	27	172	28
Operating time (min)				
Mean(95% CI)	30.9 (27.0–34.8)	8.7 (7.3–10.1)	42.2 (39.7–44.7)	16.4 (12.6–20.2)
Median	30	10	40	15
Range	10-65	3-15	15-120	3-35
SD	12.9	3.5	16.5	9.7
Fluid loss deficit (mL)				
Mean(95% CI)	648.6 (512.8–784.4)	220.4 (138.1–302.7)	741.8 (645.9–837.7)	660.0 (418.6–901.4)
Median	500	200	500	450
Range	0-2130	0-800	0-3000	0-1800
SD	446.1	208.1	638.4	622.5

Gynecol Surg (2011) 8:193–196

Table 1 Data on hysteroscopic myomectomy and polypectomy with the HM

Tissue	*N*	Age (years)[a]	Diameter of tissue (cm)[b]	Installation time (min)[b]	Operating time (min)[b]	Fluid deficit (mL)[a]
Myoma	37	45 (26–49)	2.0 (0.4)	8.7 (1.4)	18.2 (4.1)	440 (100–890)
Polyp	278	47 (23–81)	2.4 (0.7)	7.3 (2.5)	6.6 (3.3)	40 (0–300)

[a] Values are median (range)

[b] Values are mean (SD)

Emanuel MH The Intra Uterine Morcellator: a new hysteroscopic operating technique to remove intrauterine polyps and myomas. J Minim Invasive Gynecol. 2005 Jan-Feb;12(1):62-6.

Hamerlynck Clinical implementation of the hysteroscopic morcellator for removal of intrauterine myomas and polyps. A retrospective descriptive study. Gynecol Surg. 2011 May;8(2):193-196. Epub 2010 Sep 21.

- Aspiration of tissue fragments through the instrument instead of separate removal of tissue fragments by the surgeon with the loop of the resectoscope. (takes less time, is easier, less complications)
- Fewer entries, reducing the risk of perforation.
- Histologic analysis without electrocution alterations
- Physiologic saline solution
- Tissue fragments are removed through the instrument and prevent chips from accumulating and obscuring the hysteroscopic view.
- No gas bubbles

Instruments and Techniques

Hysteroscopic Morcellator for Removal of Intrauterine Polyps and Myomas: A Randomized Controlled Pilot Study among Residents in Training

Heleen van Dongen, MD*, Mark Hans Emanuel, MD, PhD, Ron Wolterbeek, MD, J. Baptist Trimbos, MD, PhD, and Frank Willem Jansen, MD, PhD

Outcome measures of surgery in 2 randomized groups; resectoscopy and intrauterine morcellator

Outcome measure	Resectoscopy	Morcellator
Operating time in min	17.0 [14.1–19.9; 8.4]	10.6 [7.3–14.0; 9.5]
Total distension medium used in mL	5050 [4106–5994; 2594]	3413 [2209–4617; 3416]
Total fluid deficit in mL	545 [406–684; 382]	409 [229–589; 511]
Number of insertions	7 {3–50}	1 {1–2}
Take control by trainer	5 (17%)	1 (3%)

No learning curve has been observed

van Dongen Hysteroscopic morcellator for removal of intrauterine polyps and myomas: a randomized controlled pilot study among residents in training. J Minim Invasive Gynecol. 2008 Jul-Aug;15(4):466-71.

Original Article

Long-Term Outcomes After Intrauterine Morcellation vs Hysteroscopic Resection of Endometrial Polyps

Mariam M. AlHilli, MBBCh, Kayla E. Nixon, BS, Matthew R. Hopkins, MD, Amy L. Weaver, MS, Shannon K. Laughlin-Tommaso, MD, MPH, and Abimbola O. Famuyide, MBBS

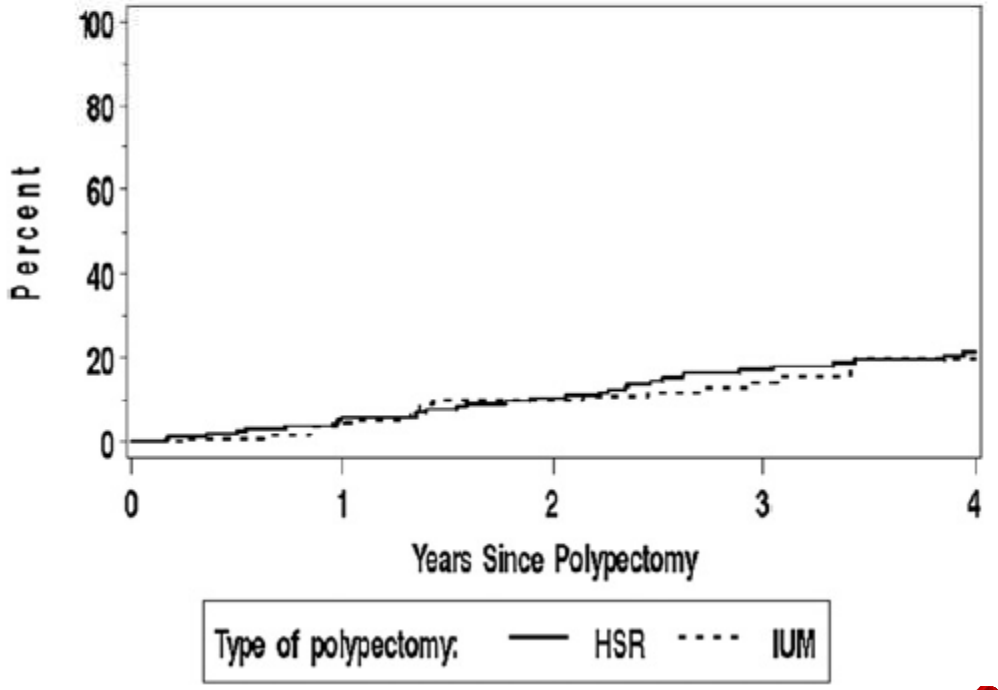
Recurrance rate

20.9% HSR
15.1% IUM

Time to AUB recurrence

2.2 years HSR
1.4 years IUM

Cumulative incidence of recurrent abnormal uterine bleeding according to type of polypectomy.



AlHilli Long-term outcomes after intrauterine morcellation vs hysteroscopic resection of endometrial polyps. J Minim Invasive Gynecol. 2013 Mar-Apr;20(2):215-21.

Summary of polyp histologic analysis based on permanent section, by type of polypectomy[a]

Variable	HSR (n = 253)	IUM (n = 188)
Benign endometrial polyp	195 (77.1)	148 (78.7)
Benign endometrial tissue (endometrium only)	27 (10.7)	18 (9.6)
Cystic hyperplasia	0	1 (0.5)
Endocervical polyp	13 (5.1)	2 (1.1)
Cystic endometrial polyp	3 (1.2)	0
Hyperplasia without atypia	6 (2.4)	15 (8.0)
Hyperplasia with atypia	3 (1.2)	4 (2.1)
Adenocarcinoma	5 (2.0)	3 (1.6)
Leiomyoma	3 (1.2)	3 (1.6)
Adenomyoma	1 (0.4)	1 (0.5)
Other	4 (1.6)	3 (1.6)

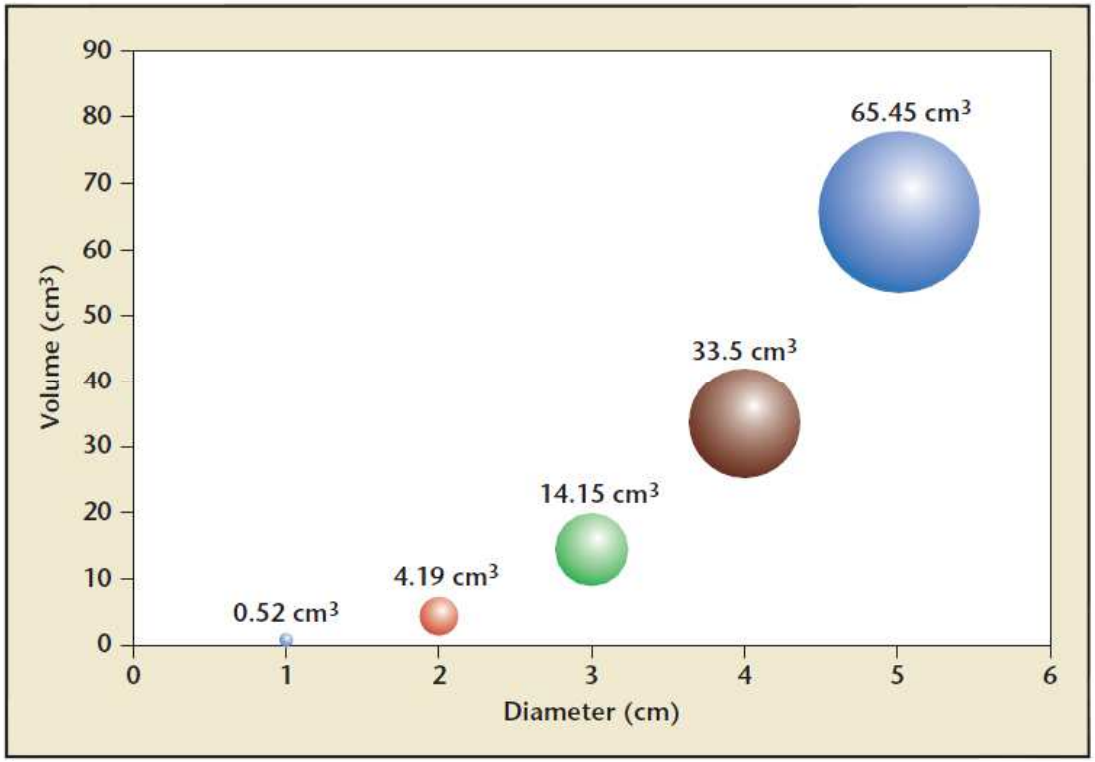
HSR = hysteroscopic resection; IUM = intrauterine morcellation.

Concerns that the pathologic interpretation of endometrial polyp specimens may be compromised by the tissue morcellation that is characteristic of the IUM procedure.

Of **441** pathology specimens evaluated, there were no cases reported of inability to establish histopathologic diagnoses.

AlHilli Long-term outcomes after intrauterine morcellation vs hysteroscopic resection of endometrial polyps. J Minim Invasive Gynecol. 2013 Mar-Apr;20(2):215-21.

- ✘ Inability to coagulate bleeding vessels
- ✘ HM cannot be used for the treatment of type 2 submucous fibroids
- ✘ The cost of the disposables (blades and tubings) needed to perform a HM procedure is higher than that of the material needed for a hysteroscopic resection.
- ✘ Regional or general anesthesia is mandatory for the HM procedure
- ✘ In case of larger myomas, the use of the HM can become quite time consuming



V= πd^3 /6

Resection rate and procedure time will be a function of the volume, density, and type of myoma
tissue.

Cohen S, Greenberg JA. Hysteroscopic morcellation for treating intrauterine pathology. Rev Obstet Gynecol. 2011 Summer;4(2):73-80

Resectoscopy

(1)how quickly the surgeon deploys each pass of the loop

(2)how much tissue each bite with the loop resects

(3)How quickly the tissue chips can be removed from the uterine cavity.

Hysteroscopic morcellation

(1)how much contact the cutting window maintains with the myoma

(2)how quickly the device can cut tissue and aspirate it out.

Cohen S, Greenberg JA. Hysteroscopic morcellation for treating intrauterine pathology. Rev Obstet Gynecol. 2011 Summer;4(2):73-80

MyoSure

MyoSure system has a **smaller 2.5-mm inner blade** that rotates and reciprocates within a 3-mm outer tube at speeds as high as 6000 rpm

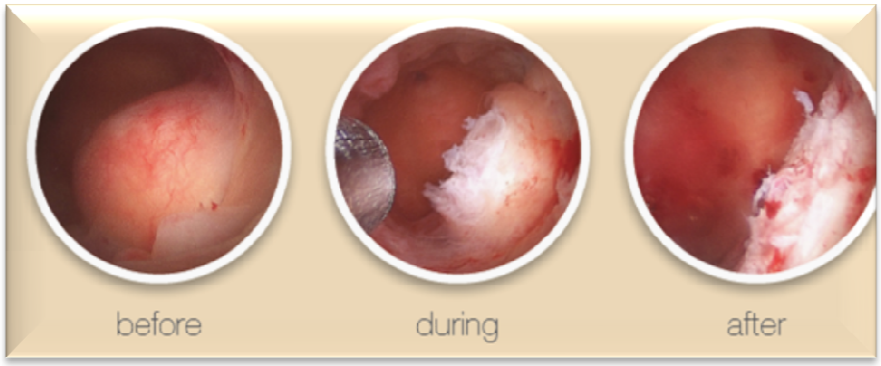
The blade and hand piece are combined into a single-use device that is then attached to suction and a motor control unit.

The device is introduced into the uterus through a **6.25-mm** offset lens, 0° custom-designed continuous flow hysteroscope that is compatible with all currently available fluid management systems

Cohen Hysteroscopic morcellation for treating intrauterine pathology. Rev Obstet Gynecol. 2011 Summer;4(2):73-80

Comparison of Device Characteristics of TRUCLEAR™ Hysteroscopic Morcellator and MyoSure® Tissue Removal System

Morcellator Characteristic	TRUCLEAR	MyoSure
Device outer diameter	4 mm	3 mm
Hysteroscope outer diameter	9 mm	6.25 mm
Pump compatibility	Smith & Nephew pump	Any fluid management system
Blade rotational speed	1100 rpm	6000 rpm
Blade edge	Inner bevel	Outer bevel
Maximum rate of suction	200 mm Hg	400 mm Hg



Cohen Hysteroscopic morcellation for treating intrauterine pathology. Rev Obstet Gynecol. 2011 Summer;4(2):73-80

Original Research

Hysteroscopic Morcellation Compared With Electrical Resection of Endometrial Polyps

A Randomized Controlled Trial

Paul P. Smith, MBChB (Hons), Lee J. Middleton, MSc, Mary Connor, MD, and T. Justin Clark, MD (Hons)

2014: Office hysteroscopy…

Smith Hysteroscopic morcellation compared with electrical resection of endometrial polyps: a randomized controlled trial. Obstet Gynecol. 2014 Apr;123(4):745-51.

Description | Specifications | Ordering Information

TRUCLEAR Operative Hysteroscope 5.0

- Rigid hysteroscope with straight-through D-shaped working channel
- Optics (0.8 mm) designed to provide brilliant visualization
- 5 mm, 15 Fr, 0° hysteroscope

TRUCLEAR Sheath 5.6

- Enables uninterrupted continuous flow and optimized visualization
- 5.6 mm, 17 Fr; 205 mm working length

TRUCLEAR Calibration Insert 2.9

- Reusable insert used to ensure intrauterine pressure and flow is maintained when morcellator is in use

TRUCLEAR 5.0 Hysteroscope Set

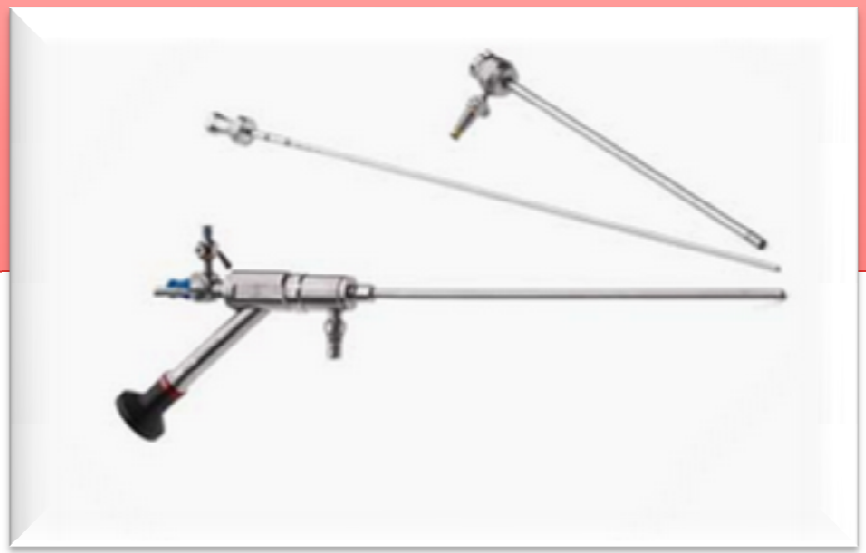
http://www.sntruclear.com/products/truclear-5-0-hysteroscope-set

Vaginoscopy
(passage of the hysteroscope into the uterine cavity without the use of a vaginal speculum or instrumentation of the ectocervix)

No cervical preparation

Normal saline (0.9% w/v NaCl)

Polyp removal under direct hysteroscopic vision



Smith Hysteroscopic morcellation compared with electrical resection of endometrial polyps: a randomized controlled trial. Obstet Gynecol. 2014 Apr;123(4):745-51.

Table 2. Surgical Technique and Complications

Surgical Technique and Complications	Hysteroscopic Morcellation (n=62)	Electrical Resection (n=59)
Surgical technique		
Speculum used	28 (45)	37 (63)
Cervical dilatation	30 (48)	31 (53)
Cervical anesthesia	31 (50)	34 (58)
Removal success		
Total removal	61 (98)	49 (83)
Partial removal	0	7 (12)*
Failed removal	1 (2)†	3 (5)*
Complications		
Vasovagal reactions	1 (2)	6 (10)
Others	0	0

Table 3. Pain Scores Measured on a 100-Point Visual Analog Scale

Pain Score	Hysteroscopic Morcellation	Electrical Resection
Baseline	8.1±9.4 (60)	5.1±9.7 (58)
During procedure	35.9±23.5 (60)	52.0±23.5 (58)
After procedure	23.9±21.2 (60)	31.0±23.9 (59)

Smith Hysteroscopic morcellation compared with electrical resection of endometrial polyps: a randomized controlled trial. Obstet Gynecol. 2014 Apr;123(4):745-51.

The economic advantages of the office compared with the traditional inpatient setting for polypectomy are primarily driven by the avoidance of expensive inpatient bed and theater facilities.

Saridogan Cost-analysis comparison of outpatient see-and-treat hysteroscopy service with other hysteroscopy service models. J Minim Invasive Gynecol 2010;17:518–25.
Hidlebaugh A comparison of clinical outcomes and cost of office versus hospital

ELSEVIER

JMIG The Journal of Minimally Invasive Gynecology

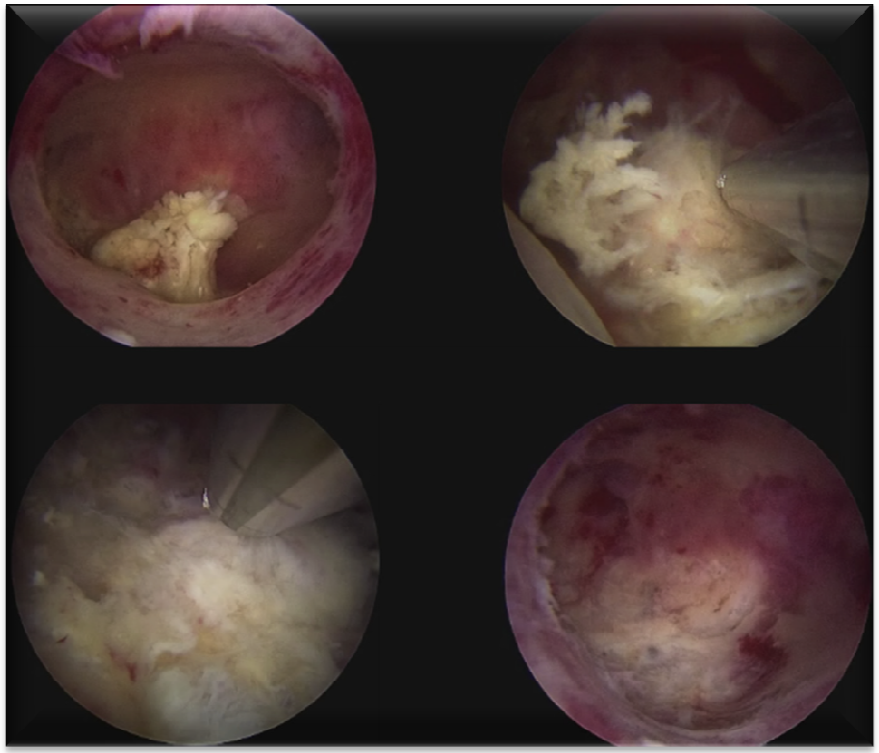
Original Article

An Alternative Approach for Removal of Placental Remnants: Hysteroscopic Morcellation

Tjalina W. O. Hamerlynck, MD, Mathijs D. Blikkendaal, MD, Benedictus C. Schoot, MD, PhD, Miriam M. F. Hanstede, MD, and Frank Willem Jansen, MD, PhD*

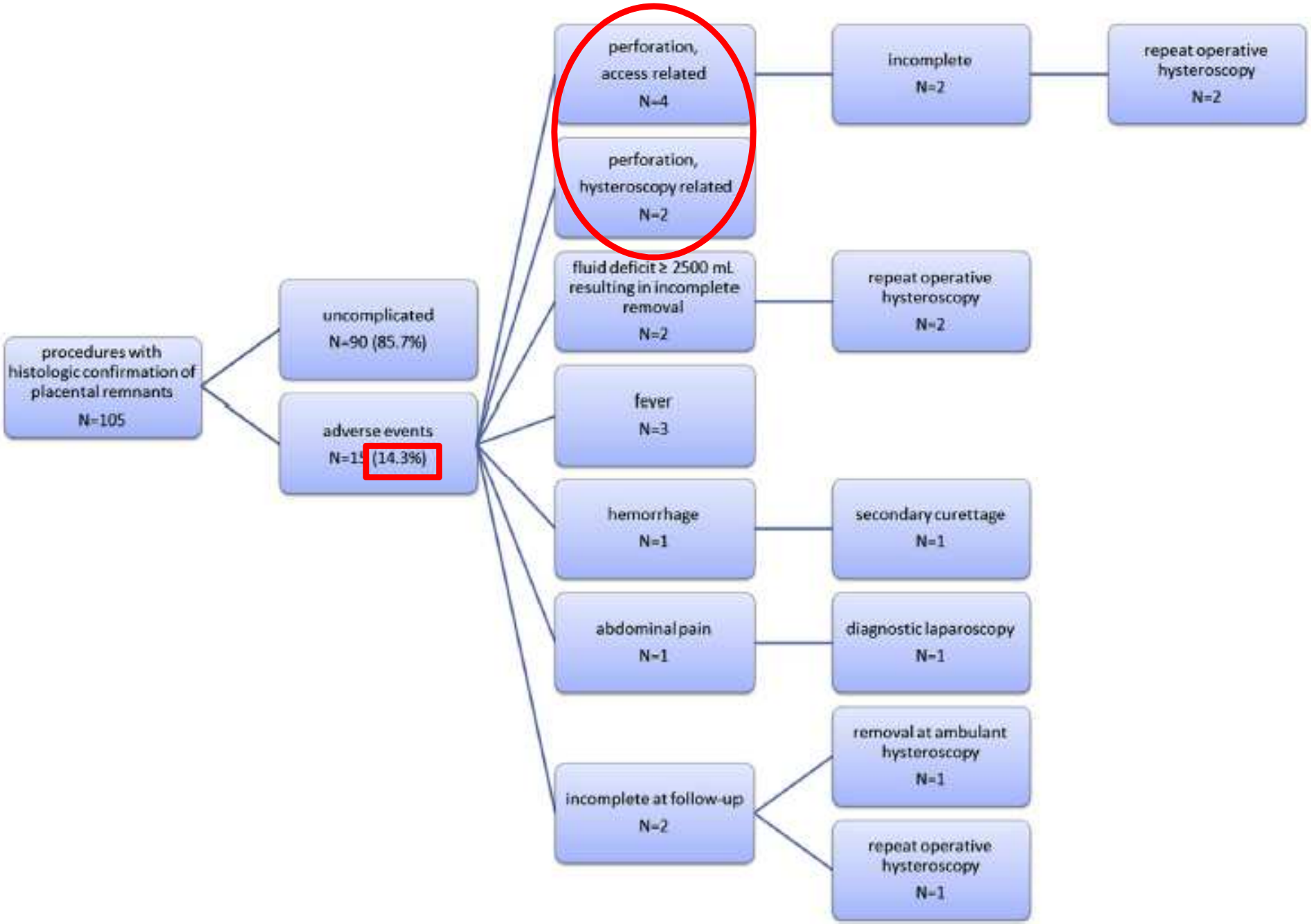
… a provocation…

Hamerlynck An alternative approach for removal of placental remnants: hysteroscopic morcellation. J Minim Invasive Gynecol. 2013 Nov-Dec;20(6):796-802



Procedure characteristics	
Time since end of pregnancy (wk)	
Mean (SD)	11.4 (7.1)
Median (Range)	10 (1–46)
Diameter of placental remnants (cm)	
Mean (SD)	2.6 (1.5)
Median (Range)	2.0 (0.8–9.7)
Duration of procedure (min)	
Mean (SD)	26.2 (12.4)
Median (Range)	20 (10–60)
Fluid deficit (mL)	
Mean (SD)	1013.6 (739.5)
Median (Range)	1000 (0–3300)
Anesthesia	
General	58 (63.0)
Spinal	34 (37.0)
Completeness of removal	
Complete	99 (94.3)
Incomplete, additional treatment	6 (5.7)
Hospital stay (day)	
1	91 (90.1)
>1	10 (9.9)

Hamerlynck An alternative approach for removal of placental remnants: hysteroscopic morcellation. J Minim Invasive Gynecol. 2013 Nov-Dec;20(6):796-802


procedures with histologic confirmation of placental remnants
N=105
uncomplicated
N=90 (85.7%)
adverse events
N=15 (14.3%)
perforation, access related
N=4
incomplete
N=2
repeat operative hysteroscopy
N=2
perforation, hysteroscopy related
N=2
fluid deficit ≥ 2500 mL resulting in incomplete removal
N=2
repeat operative hysteroscopy
N=2
fever
N=3
hemorrhage
N=1
secondary curettage
N=1
abdominal pain
N=1
diagnostic laparoscopy
N=1
incomplete at follow-up
N=2
removal at ambulant hysteroscopy
N=1
repeat operative hysteroscopy
N=1

Use of a hysteroscopic morcellator to resect miscarriage in a woman with recurrent Asherman syndrome

Dr Margaret Harpham
B Med
Obstetrics and Gynaecology Fellow
Royal Hospital for Women, Sydney.

Title page

Hysteroscopic morcellator: state of art and new perspectives.

Systematic review

Emanuele Ancona[1] M.D , Salvatore Gizzo[1] M.D.; Marco Noventa[1] M.D. & Giovanni Battista Nardelli[1] M.D.

1 - Department of Woman and Child Health – University of Padua (ITALY)

In press...