

Hysteroscopic Myomectomy

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INTRODUCTION

- Uterine fibroids → Prevalence – 70 – 80% (at age 50yrs)
- Submucosal Fibroids → 5.5 – 10% of all uterine fibroids
 - AAGL Practice report 2012
- Costs (USA) > Breast, Colon, Ovarian CA
 - Bonafede et al. 2018
- Hysteroscopic Myomectomy (HM) – first line, minimally invasive and conservative surgical treatment for women who have not completed their reproductive path.

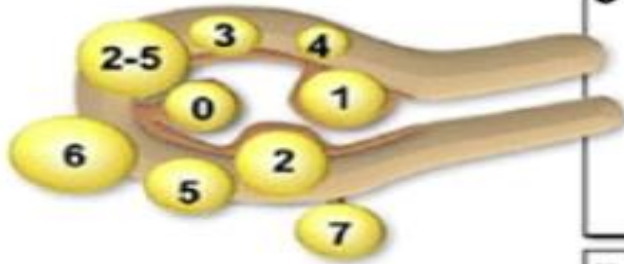
FIGO Fibroid Classification

Polyp
Adenomyosis
Leiomyoma
Malignancy & hyperplasia

Submucosal
Other

Coagulopathy
Ovulatory dysfunction
Endometrial
Iatrogenic
Not yet classified

Leiomyoma subclassification system



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.

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Hysteroscopic myomectomy: The guidelines of the International Society for Gynecologic Endoscopy (ISGE)



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HM – Key Questions

Hysteroscopic myomectomy – key clinical questions.

- Question 1: How should a patient be evaluated before HM?
 - Question 2: Which is the best classification system for submucous LMs in relation to the surgical outcome?
 - Question 3: Are there any indications for preoperative medical treatment?
 - Question 4: What is the best resection technique and what are the most suitable instruments for resection of type 0 submucosal LMs?
 - Question 5: What is the best resection technique and what are the most suitable instruments for resection of type 1 and type 2 LMs?
 - Question 6: Which measures can reduce the perforation rate in HM?
 - Question 7: Which measures can reduce bleeding during and after HM?
 - Question 8: Which limit should be considered for fluid deficit and which measures can reduce the rate of distention fluid-related complications?
 - Question 9: Which measures can reduce cervical trauma, infections and adhesions?
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Abbreviation: HM, hysteroscopic myomectomy; LMs, leiomyomas.

How should a Pt be evaluated before HM?

- Fibroids suspected if AUB and Dx established by imaging - Ultrasound (US), SIS, MRI, Diagnostic hysteroscopy
- Aim to ID right candidate for HM, assess risks, ↓ complications and complete surgery successfully
- US is first line (availability, cost, reliability)
- Hysteroscopy “gold standard”
- SIS ≈ hysteroscopy > TVUS
 - Bittencourt et al. 2017
- MRI > other techniques (routine use not cost effective)
 - Good for pts with ↑ BMI, multiple fibroids, ↑↑uterine size, other uterine lesions, differentiate adenomyosis and adenomyomas, uterine malignancies
 - Van der Bosch et al. 2015, AAGL Practice report 2012, Sizzy et al 2018
- Incidence of Uterine Sarcomas = 0.13%
 - Vilos et al. 2009

Grading of Recommendations

GRADE approach – grading of recommendations, risk/benefit and quality of supporting evidence.

Grade of recommendation	Risk/benefit	Quality of supporting evidence
1A. Strong recommendation, high quality evidence	Benefits clearly outweigh risk and burdens, or vice versa.	Consistent evidence from well performed randomized, controlled trials or overwhelming evidence of some other form. Further research is unlikely to change our confidence in the estimate of benefit and risk.
1B. Strong recommendation, moderate quality evidence	Benefits clearly outweigh risk and burdens, or vice versa.	Evidence from randomized, controlled trials with important limitations (inconsistent results, methodologic flaws, indirect or imprecise), or very strong evidence of some other research design. Further research (if performed) is likely to have an impact on our confidence in the estimate of benefit and risk and may change the estimate.
1C. Strong recommendation, low quality evidence	Benefits appear to outweigh risk and burdens, or vice versa.	Evidence from observational studies, unsystematic clinical experience, or from randomized, controlled trials with serious flaws. Any estimate of effect is uncertain.
2A. Weak recommendation, high quality evidence	Benefits closely balanced with risks and burdens.	Consistent evidence from well performed randomized, controlled trials or overwhelming evidence of some other form. Further research is unlikely to change our confidence in the estimate of benefit and risk.
2B. Weak recommendation, moderate quality evidence	Benefits closely balanced with risks and burdens, some uncertainty in the estimates of benefits, risks and burdens.	Evidence from randomized, controlled trials with important limitations (inconsistent results, methodologic flaws, indirect or imprecise), or very strong evidence of some other research design. Further research (if performed) is likely to have an impact on our confidence in the estimate of benefit and risk and may change the estimate.
2C. Weak recommendation, low quality evidence	Uncertainty in the estimates of benefits, risks, and burdens; benefits may be closely balanced with risks and burdens.	Evidence from observational studies, unsystematic clinical experience, or from randomized, controlled trials with serious flaws. Any estimate of effect is uncertain.

Recommendations 1-4

Recommendation 1: The preoperative evaluation of patients planned to be submitted to HM should start with detailed history and physical examination (**Grade 1A**).

Recommendation 2: Ultrasonographic examination should be offered to all patients with uterine LMs (**Grade 1A**) while MUSA terms, definitions and measurements are recommended to be used for the description of scanning and sonographic findings (**Grade 1B**).

Recommendation 3: For planning HM, evaluation of the uterus with SIS or combined assessment by TVUS and diagnostic hysteroscopy is recommended (**Grade 1A**). MRI evaluation is appropriate when ultrasound-based assessment faces its limitations (e.g., patients with high body-mass-index, numerous LMs, very enlarged uterine size, coexistence of LMs and other uterine/pelvic lesions and uncertain nature of the uterine tumor) (**Grade 1A**).

Recommendation 4: Proper informed consent has to be given to the patient explaining alternative therapeutic strategies, the potential risks of HM, eventual need for a second intervention, and the likelihood of LM recurrence (**Grade 1A**).

Classification of Submucous Fibroids

- **STEPW** classification
 - **S**ize, **T**opography, **E**xtension, **P**enetration, **W**all position
 - Lasmar et al. 2005,2011
 - Better prediction of risk of surgery etc. than ESGE system

Recommendation 5: The use of STEPW submucosal LM classification system is recommended to predict the complex surgeries, incomplete removal of the LM, long operative time, fluid overload and other major complications (**grade 1B**).

Classification of Submucous Fibroids

STEPW classification system of submucosal LMs (adapted from (24)).

Points	Size	Topography	Extension of the base	Penetration	Lateral wall
0	<2 cm	Low	<1/3	0	+1
1	2-5 cm	Middle	1/3-2/3	<50%	
2	>5 cm	Upper	>2/3	>50%	
Score	_____+	_____+	_____+	_____+	_____
Score 0-4	Group I	Low complexity HM			
Score 5-6	Group II	High complexity HM, two-step HM, GnRH agonist use			
Score 7-9	Group III	An alternative to HM to be considered			

Abbreviation: GnRH, gonadotropin-releasing hormone; HM, hysteroscopic myomectomy; LMs, leiomyomas.

Preoperative Medical Treatment

- No advantage of administering GnRH-a before HM
 - Complete resection, operative time, fluid absorption, operative complications
 - Correa et al. 2020
- Ulipristal Acetate (UPA)
 - Low quality evidence
 - Suspended in Europe – Hepatotoxicity?
 - Rosenberg et al. 2020

Recommendation 6: The preoperative treatment with GnRH analogues is not routinely recommended because it has not been proved to be useful to facilitate a complete resection of submucous LM, reduce operative time and fluid absorption, and avoid major complications (**grade 2B**).

Type 0 Fibroids

- Key goal is complete submucous fibroid removal respecting the anatomical integrity of the uterus
- Different techniques – slicing, morcellation, cutting off the pedicle (office setting)
 - If slicing – NB to cut on the return movement only!
- Slicing \approx morcellation (\downarrow operating time and learning curve)
 - Van Dongen et al. 2008, Emanuel et al 2005
- Office setting to be considered for small pedunculated lesions

Recommendation 7: For type 0 LMs, in addition to resectoscopy (slicing technique), morcellation is recommended, being faster and having a shorter learning curve with respect to resectoscopy (**grade 1C**).

Type 1 and 2 Fibroids

- Slicing Technique vs Morcellation
 - Lack of high quality comparative data
 - No conclusive use to favour morcellation (more data needed)
 - Slicing Technique recommended (Practicable + reproducible)
 - No comparative safety data
- Slicing – Cold vs Thermal loop
 - Not enough data to favour Cold vs Thermal
- Slicing – Bipolar vs Monopolar electrosurgery
 - No proven difference in symptom or reproductive outcomes

Type 1 and 2 Fibroids (cont)

- Alternative techniques
 - Hydromassage and bimanual uterine massage
 - Interesting but RCT's needed (Zayed et al. 2015)
 - Leaving submucous fibroids in the cavity after office hysteroscopy enucleation – option for small grade 0-1 fibroids (89% success rate)
 - Tanvir et al. 2021
- Intra ops US may help to avoid complication (perforation) and increase single step ops viability
 - Korkmazer et al. 2016
 - Ludwin et al. 2013

Type 1 and 2 Fibroids (cont)

Recommendation 8: For type 1-2 LMs, slicing technique is recommended at this moment in time, being feasible and reproducible with respect to morcellation alone (**grade 1C**).

Recommendation 9: No recommendation can be advanced concerning cold and thermal loop myomectomy for type 1-2 LMs (**grade 2C**).

Recommendation 10: Monopolar compared to bipolar type 1-2 LM resection is equivalent in terms of menstrual symptom relief and reproductive outcome (**grade 2B**).

Principal HM specific complications and preventative measures

- Cervical(Cx) trauma and Cx/uterine perforation
 - Mainly dependent on
 - Difficulty of the procedure, Equipment/technique used, Expertise of the surgeon, Characteristics of the patient
Munro et al. 2025
 - Risks include
 - Anatomical variation (extreme ante/retroversion), narrow/stenotic Cx, PM, CS or previous LLETZ
 - Conservative approach if blunt perforation is suspected
 - Hot loop perforation – laparoscopic exploration NB!
 - Vilos et al. 2020
 - Misoprostol as a Cx ripening agent – conflicting evidence
 - Hua et al. 2016, Polyzos et al. 2012

Principal HM specific complications and preventative measures (cont)

Complications of operative hysteroscopy (based on [63]).

Complication	Incidence (%)
Hemorrhage requiring red blood cell transfusion or hemostatic intervention	0.00–0.16
Uterine perforation	0.12–3.00
Infection	0.01–1.42
Operative hysteroscopy intravascular absorption syndrome (using isotonic solutions)	
Mild (absorption of 1000–2000 mL)	5–10%
Sever (absorption of > 2000 mL)	<1
Intrauterine adhesions unknown	Unknown
Resection of multiple vs. single myomas	45.50 vs. 31.30*

* Information based on a limited number of cases studied.

Recommendation 11: The use of vaginal misoprostol prior to HM is not routinely recommended in order to reduce cervical trauma and perforation (grade 2B).

Distention fluid-related complications

- Distention of uterine cavity needed for visualization and treatment
- ↑Systemic absorption of distention solution → complications
- Amount of absorption \approx severity of the complications
- Continuous and accurate monitoring of fluid balance NNB!
 - Umranikar et al. 2016
- Fluid overload with N saline or hypotonic fluid – multidisciplinary support and management
 - Litta et al 2014
- > 1000ml intravasation → ↑ complications (gas embolism, myocardial ischemia etc.) – immediate discontinuation NB!
 - Dyrbye et al. 2012

Distention fluid-related complications (cont)

Recommendation 12: A fluid deficit of 1000 mL also in case of bipolar myomectomy with saline solution, in healthy women of reproductive age, contains low risk for major complications. Deficits of 1000 mL–2500 mL using saline solution need careful monitoring and termination of surgery at the slightest sign of possible embolism. Deficits of over 2500 mL need immediate termination of surgery (grade 1C).

Recommendation 13: Lower thresholds (750 mL) for fluid deficit should be considered in the elderly and in women with cardiovascular, renal or other co-morbidities (Grade 1B).

Infections

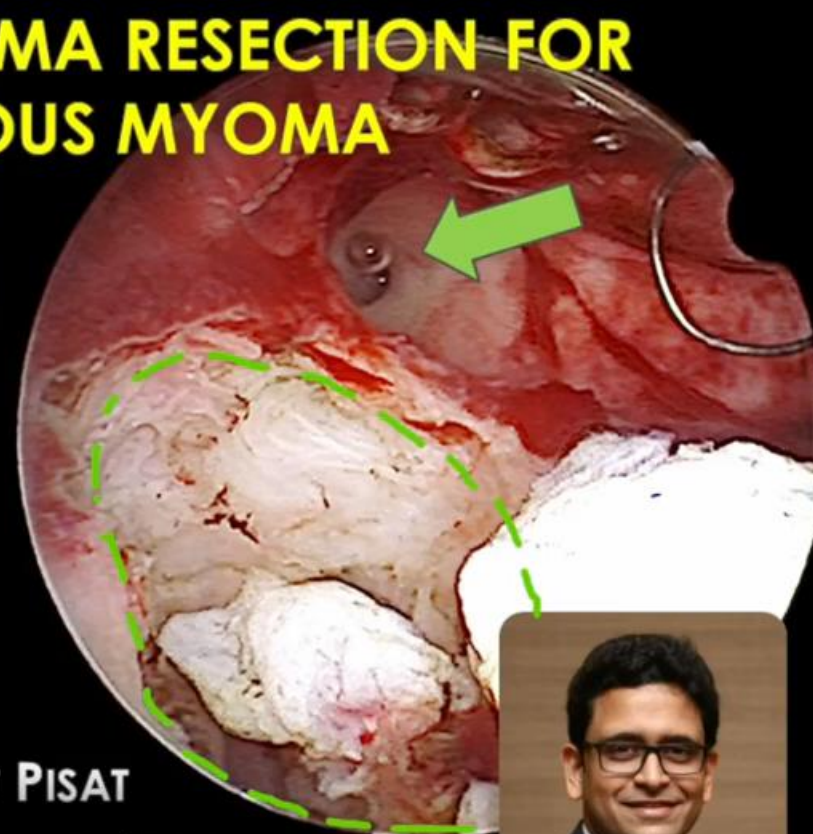
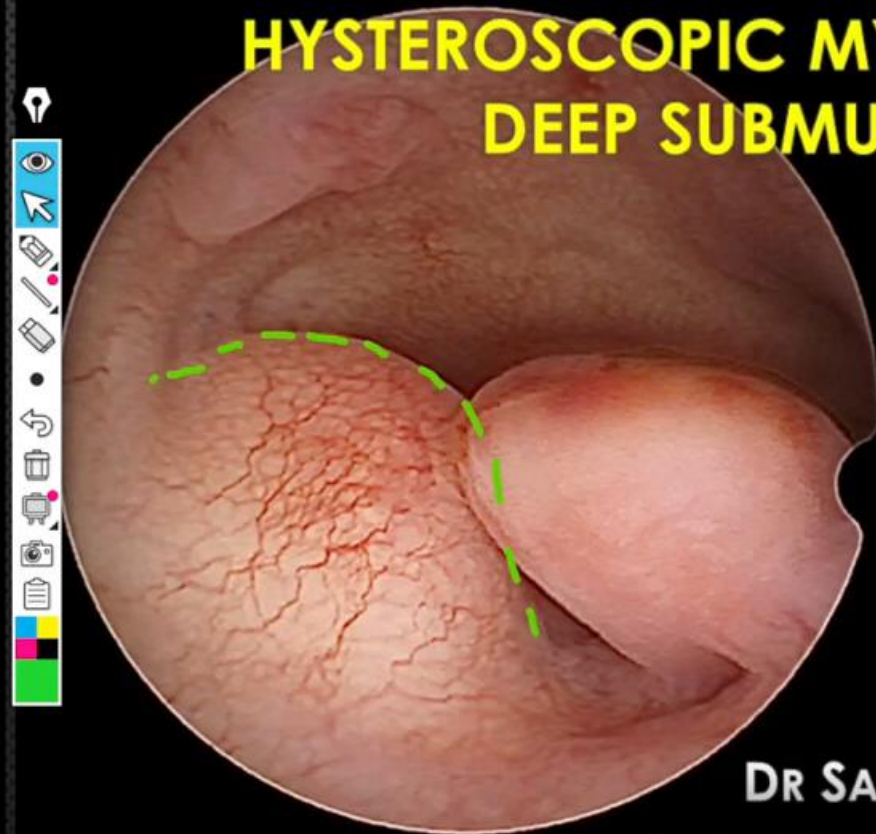
- Rate of infection after HM → Low
- No conclusion regarding routine AB prophylaxis
 - RTC's needed
 - Muzii et al. 2020

Adhesions

- Intra Uterine Adhesions (IUA) is a known complication of HM (varying in severity)
- Auto crosslinked hyaluronic acid gel reduces IUA vs no treatment
 - Mais et al. 2012, Cheng et al. 2020
- Second look hysteroscopy can be considered (fertility pts) for diagnosing and removing IUA (if suspected)
 - Sebbag et al.2019

Recommendation 14: Routine hyaluronic acid gel application is recommended after HM, particularly in case of multiple myomectomies (Grade 1B).

HYSTEROSCOPIC MYOMA RESECTION FOR DEEP SUBMUCOUS MYOMA



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Conclusions

- HM best intervention for submucous fibroids
- TVUS and diagnostic hysteroscopy (or SIS) strongly recommended for Pre ops evaluation (as well as STEPW classification)
- Type 0 fibroids – resection (+) and morcellation (++)
 - Faster and shorter learning curve
- Type 1 + 2 – resection more feasible and reproducible
- Be aware about complications (fluid deficit >1l and >750ml for older Pts and pts with comorbidities)
- ISGE paper valuable