LEIOMYOMA LECTURE FOR MEDICAL CLERKS AND INTERNS

MAIN REFERENCES

- Comprehensive Gynecology 7th edition, 2017 (Lobo RA, Gershenson DM, Lentz GM, Valea FA *editors);* chapter 18, Benign Gynecologic Lesions
- Obstetrics and Gynecology 6th ed, 2010 (Beckmann CRB, Ling FW, Barzansky BM, Herbert WN, Laube DW, Smith RP editors); Chapter 44, Uterine Leiomyoma and Neoplasia
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OUTLINE

- Definition uterine leiomyoma
- Types of myoma
- FIGO classification
- Pathophysiology
- Risk factors
- Symptoms
- Diagnosis
- Treatment
- Complications

CASE SCENARIO

- Ana, a 32 year old G0, came to your clinic with chief complaint of heavy menstrual bleeding (menorrhagia)
  - Unremarkable past medical and family histories
  - Non-smoker, non alcoholic beverage drinker; married for 3 years
  - LMP 1 week ago
- PE: stable VS, BMI 30 kg/m^2
  - pale palpebral conjunctivae; pail nailbeds
  - Normal cardiopulmonary and chest findings
  - Speculum: cervix and vagina smooth, (+) active bleeding from cervical os
  - IE: cervix smooth and firm, uterus not enlarged, smooth and moveable, no adnexal masses nor tenderness
  - RVE: smooth and pliable parametria and rectovaginal septum

INITIAL DIAGNOSIS?

- Abnormal Uterine Bleeding – L
- Anemia
- Obesity
- Primary Infertility

Differential dx:

- AUB –P
- AUB –M
- AUB - O

Polyp	→	Submucosal
Adenomyosis		Other
Leiomyoma		
Malignancy & hyperplasia		

Coagulopathy
Ovulatory dysfunction
Endometrial
Iatrogenic
Not yet classified

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UTERINE LEIOMYOMATA

- Also known as: *Leiomyoma (singular form), Leiomyoma uteri, Myoma uteri, Myoma/ myomas, Fibroids*
- Localized proliferation of smooth muscle cells surrounded by a pseudocapsule of compressed muscle fibers
- most common benign neoplasms of the uterus.
- Hormone-sensitive tumors
- Highest prevalence occurs during the 5th decade of a woman's life

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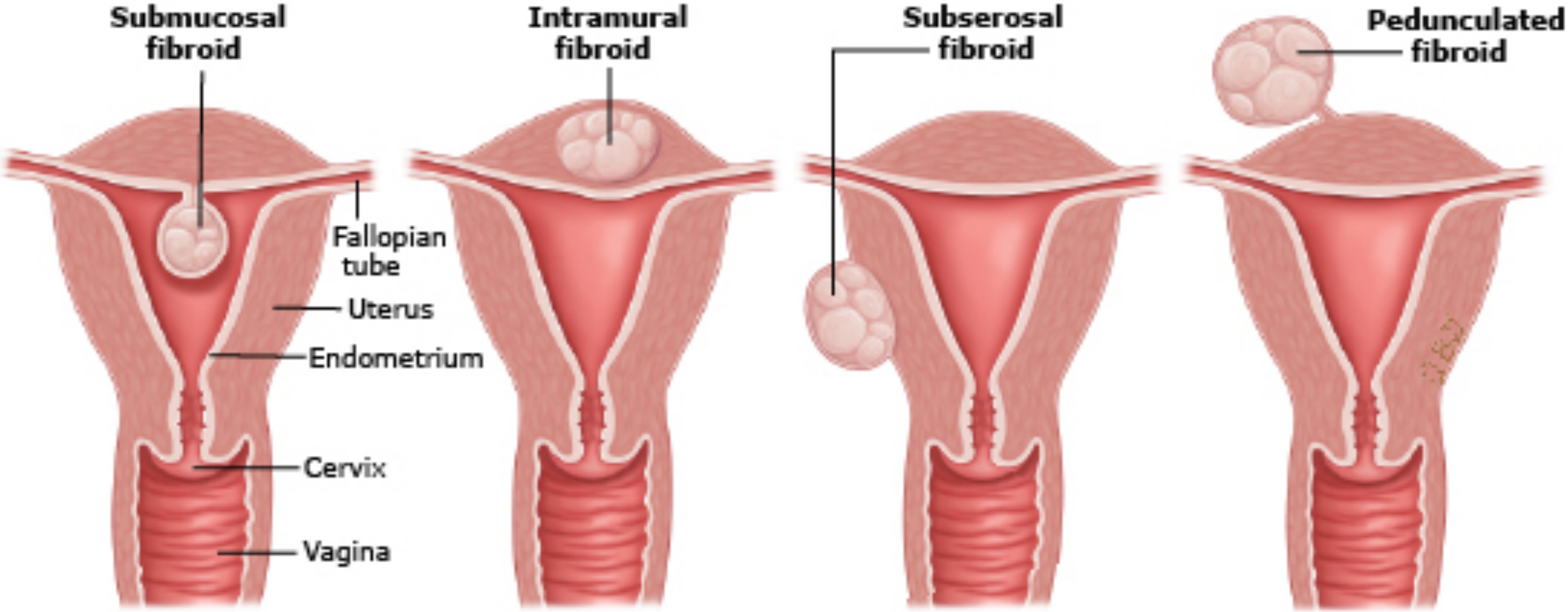
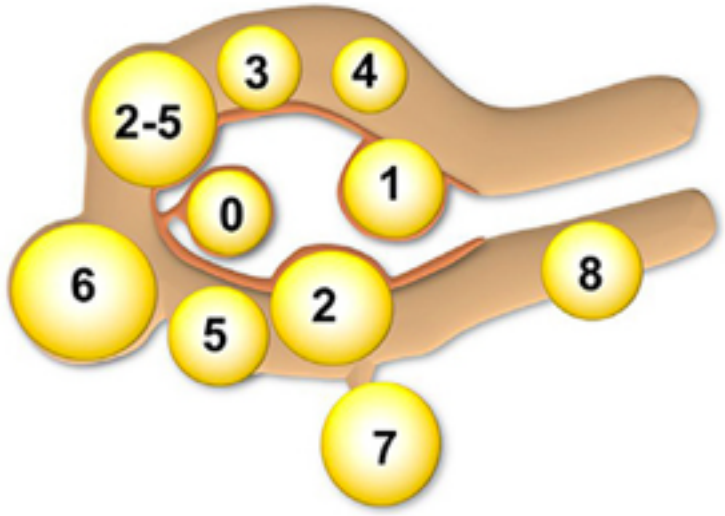


TYPES OF UTERINE LEIOMYOMATA

FIGO CLASSIFICATION OF UTERINE LEIOMYOMA

Polyp	Submucous	Coagulopathy
Adenomyosis	Other	Ovulatory dysfunction
Leiomyoma		Endometrial
Malignancy and hyperplasia		Iatrogenic
		Not otherwise classified

FIGO leiomyoma subclassification system



SM – submucous	0	Pedunculated intracavitary
	1	<50% intramural
	2	≥50% intramural
	3	Contacts endometrium; 100% intramural
O – Other	4	Intramural
	5	Subserous ≥50% intramural
	6	Subserous <50% intramural
	7	Subserous pedunculated
	8	Other (specify eg, cervical, parasitic)

Hybrid (contact both the endometrium and the serosal layer)	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	Submucous and subserous, each with less than half the diameter in the endometrial and peritoneal cavities, respectively.

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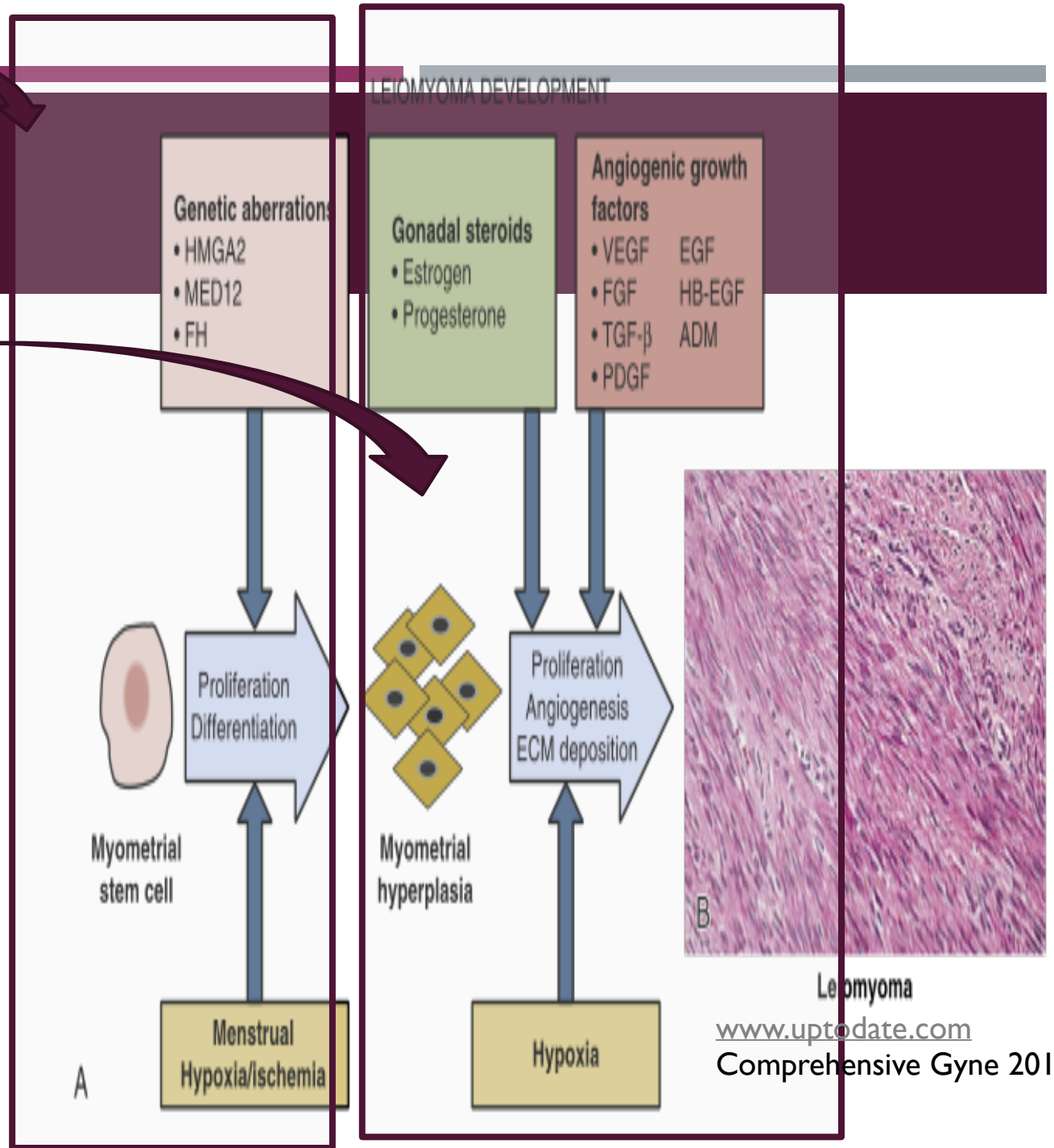
WHERE DID MYOMAS COME FROM?

At least **two** distinct components contribute to leiomyoma development:

- Transformation of normal myocytes into abnormal myocytes (**initiating event**)
- Growth of abnormal myocytes into clinically apparent tumors (**growth phase**)

Stewart EA. Histology and pathogenesis of uterine leiomyomas (fibroids) June 5, 2014. www.uptodate.com

- **Initiating event**: mutation of a single myometrial cell
- **Growth phase**: proliferation of mutated myometrial cell + proliferation of extracellular matrix due to influence of estrogen + progesterone, tumor growth factors.



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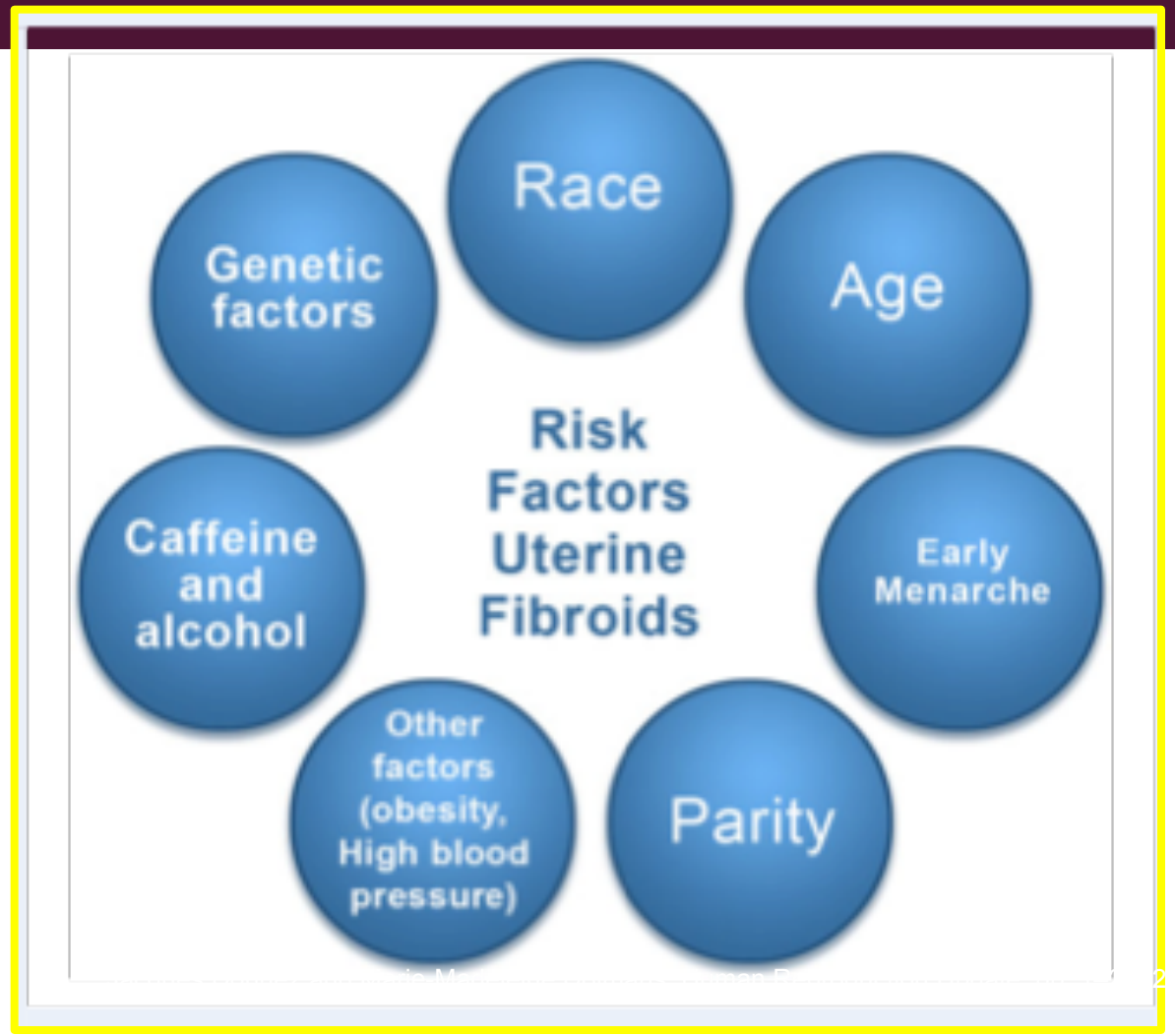
WHO ARE AT RISK FOR DEVELOPING MYOMAS?



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WHAT ARE THE SYMPTOMS OF MYOMA ?

Symptoms are classified into three categories

- Heavy or prolonged menstrual bleeding
- Bulk-related symptoms, such as pelvic pressure and pain
- Reproductive dysfunction (ie, infertility or obstetric complications)

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I. ABNORMAL UTERINE BLEEDING

- Bleeding is the most common presenting symptom
- Most frequent bleeding pattern is *menorrhagia (esp in submucous myomas)*

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1. ABNORMAL UTERINE BLEEDING

- HOW DOES MYOMA CAUSE AUB ?

1. Distortion of the endometrial cavity
2. Alteration of the normal myometrial contractile function in the arteriolar blood supply underlying the endometrium
3. Inability of the overlying endometrium to respond to the normal estrogen/ progesterone m menstrual phases, which contributes to efficient sloughing of the endometrium
4. Pressure necrosis of the overlying endometrial bed, which exposes vascular surfaces that bleed in excess of that normally found with endometrial sloughing

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NOT ALL WOMEN WITH MYOMAS PRESENT WITH VAGINAL BLEEDING…

2. PELVIC PAIN/PRESSURE

- May be a sense of progressive fullness, "something pressing down", and/or sensation of a pelvic mass
- Most commonly caused by a large intramural or subserous myoma
- Large IM or SS myoma are the most easily palpated types of myomas, and contributes to a characteristic "lumpy-bumpy" or "cobblestone sensation" during internal exam
- If large enough, the can cause complications such as:

1. Hydroureter (ureteral dilatation due to obstruction on the ureters)
2. Hydronephrosis (dilatation of the renal pelvis and calyces)
3. Urinary frequency or obstruction

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2. PELVIC PAIN/PRESSURE

- Other complications:
  - Dysmenorrhea
  - Torsion of a pedunculated myoma
  - Degeneration (we wiLl tackle this in later slides)

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3. REPRODUCTIVE DYSFUNCTION

- Submucous myomas and intramural myomas large enough to distort the endometrial cavity can cause infertility or miscarriage

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DIFFERENTIAL DIAGNOSIS (CC: AUB/ENLARGED UTERUS)

- Pregnancy
- Myometrial lesions:

1. Benign leiomyoma
2. Adenomyosis (diffuse infiltration of the myometrium) or adenomyoma
3. Leiomyoma variant
4. Leiomyosarcoma
5. Metastatic disease

- Endometrial lesions:

1. Endometrial polyp – These tend to be small and are unlikely to cause an enlarged uterus
2. Endometrial carcinoma (may invade into the myometrium) or hyperplasia
3. Carcinosarcoma – Considered an epithelial neoplasm
4. Endometrial stromal sarcoma (mimics endometrium but invades the myometrium)

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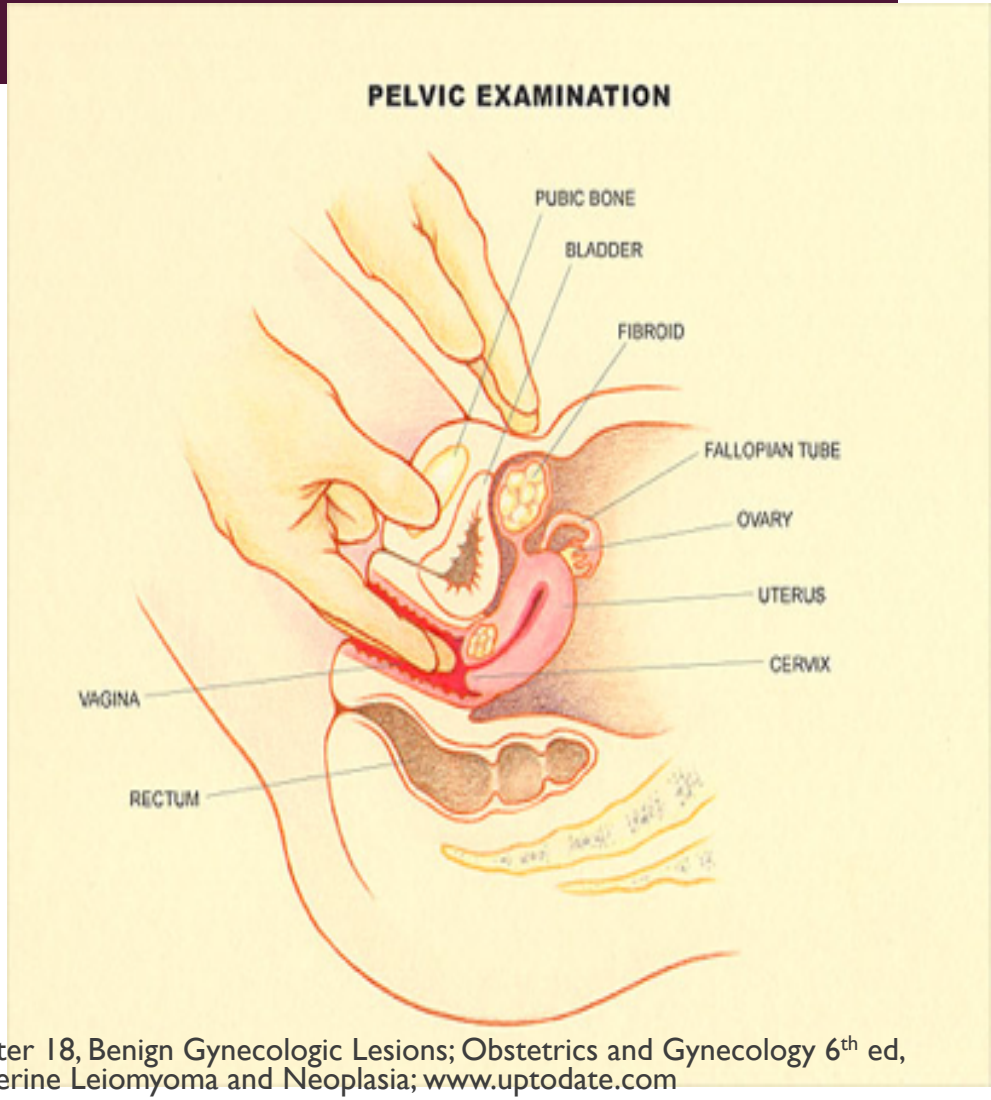
HOW DO WE DIAGNOSE MYOMA?

1. History and physical exam

- On abdominopelvic exam, myomas usually present as a large, midline, irregular-contoured, mobile pelvic mass with a characteristic hard feel or solid quality.
- The degree of enlargement is stated in terms (weeks size) that are used to estimate equivalent gestational size



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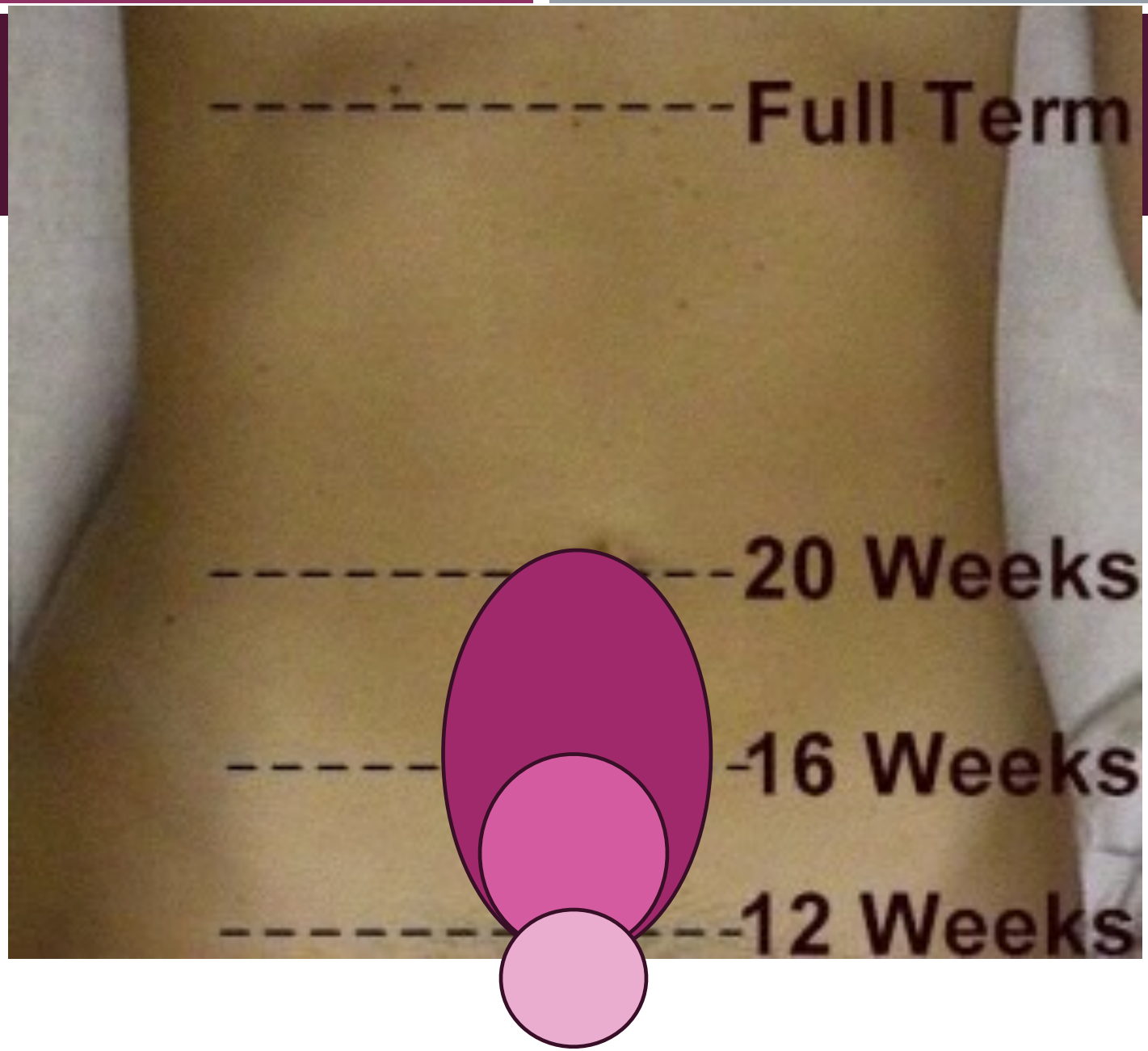
ESTIMATING MYOMA SIZE

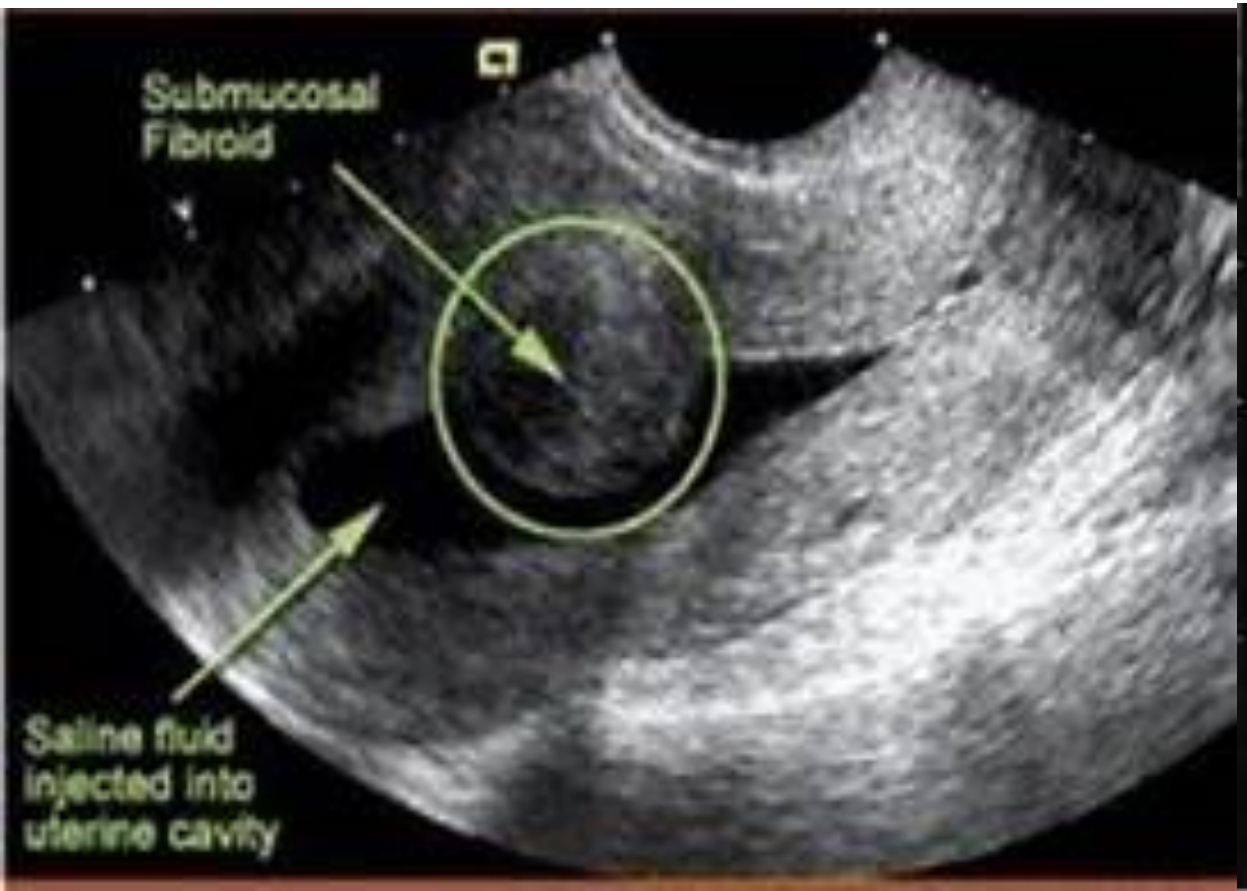


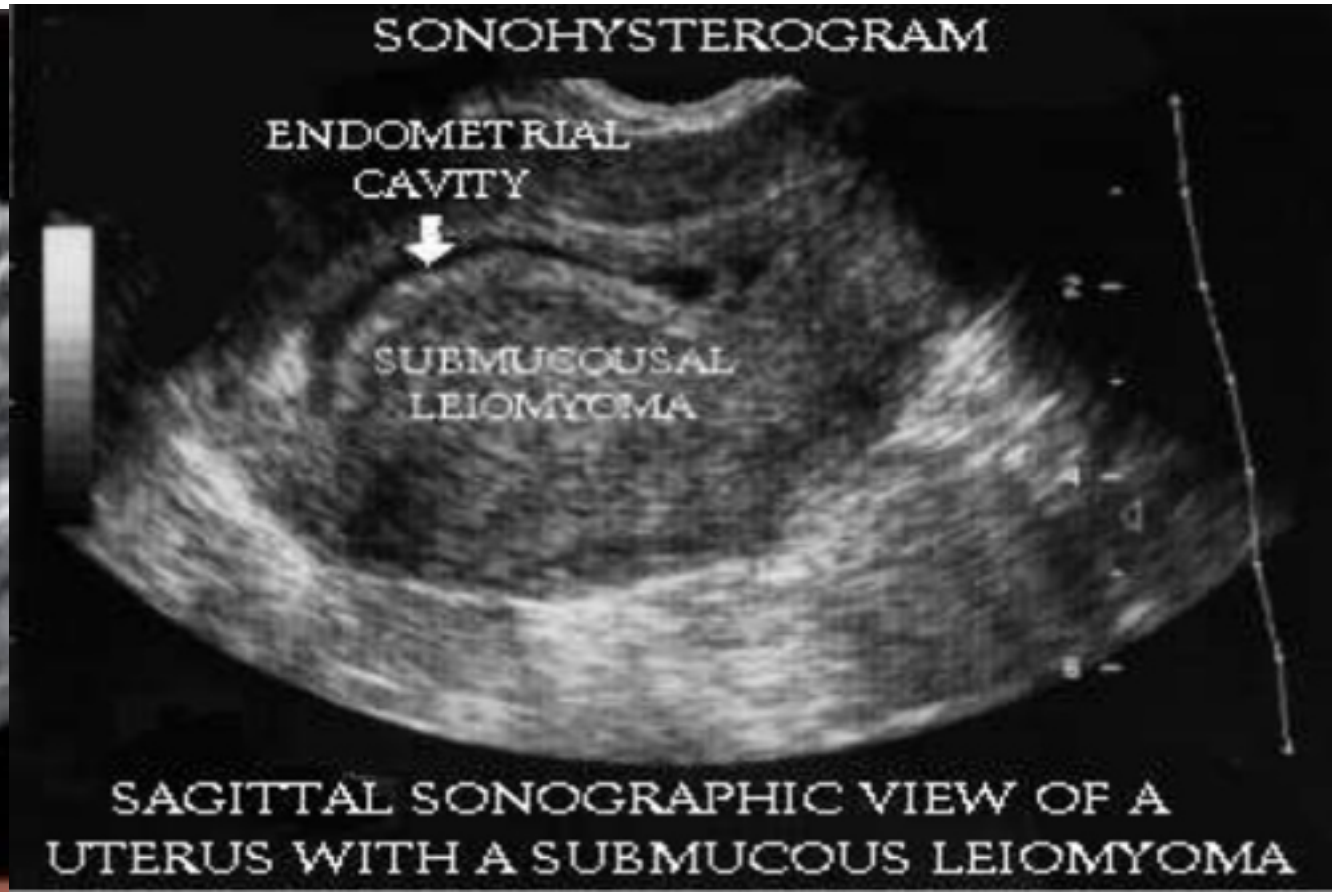
HOW DO WE DIAGNOSE MYOMA?

1. Transvaginal Ultrasound

HOW DO WE DIAGNOSE MYOMA?

2. SISH/sonohysterogram





HOW DO WE DIAGNOSE MYOMA?

3. CT scan/MRI

- Used only when results from TV/TR ultrasound are equivocal

4. Lab tests

- Laboratory testing does not have a role in the diagnosis of uterine leiomyomas.
- If a patient has AUB, then you can request lab tests to work up for AUB

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TREATMENT

- WARNING: MOST PATIENTS WITH UTERINE LEIOMYOMAS DO NOT REQUIRE (MEDICAL OR SURGICAL) TREATMENT!!!
- For women with findings of myoma but asymptomatic, they can be advised regular monitoring/observation/reassurance.
- Further uterine growth may be monitored by repeat pelvic exams or ultrasound.

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TREATMENT

- The appropriate treatment will depend on:
  - Symptoms
  - age (because most fibroids shrink or stop causing symptoms after menopause)
  - desire for future childbearing
  - size, number, and location of the myoma

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TREATMENT

1. **SURGERY**

   a. MYOMECTOMY: surgery to remove the myoma from the uterus; for patients who desire to retain childbearing potential, or whose fertility is compromised by the myoma

   Indications: large pelvic mass, abnormal uterine bleeding, pelvic pain/pressure symptoms,

   Approach to myomectomy:

   a.1. for large or intramural/subserous myomas: open surgery (laparotomy) OR laparoscopy

   a.2. for small submucous myomas: hysteroscopic myomectomy

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CONTRAINDICATIONS TO MYOMECTOMY

- Pregnancy
- Advanced adnexal disease
- Malignancy (ex, sarcoma)
- If enucleation of the myoma would severely reduce endometrial surface so that the uterus would not be functional

Comprehensive Gynecology, 6th ed. (2012), Lentz GM, Lobo RA, Gershenson DM, Katz VL; Chapters 18 and 19

TREATMENT

1. **SURGERY**

   b. HYSTERECTOMY: surgery the uterus; for patients who have completed family size, or are not desirous of future pregnancies

   Indications: large pelvic mass, abnormal uterine bleeding, pelvic pain/pressure symptoms,

   Approach to hysterectomy:

   a.1 open surgery (laparotomy) OR

   a.2. laparoscopy (minimally invasive surgery)

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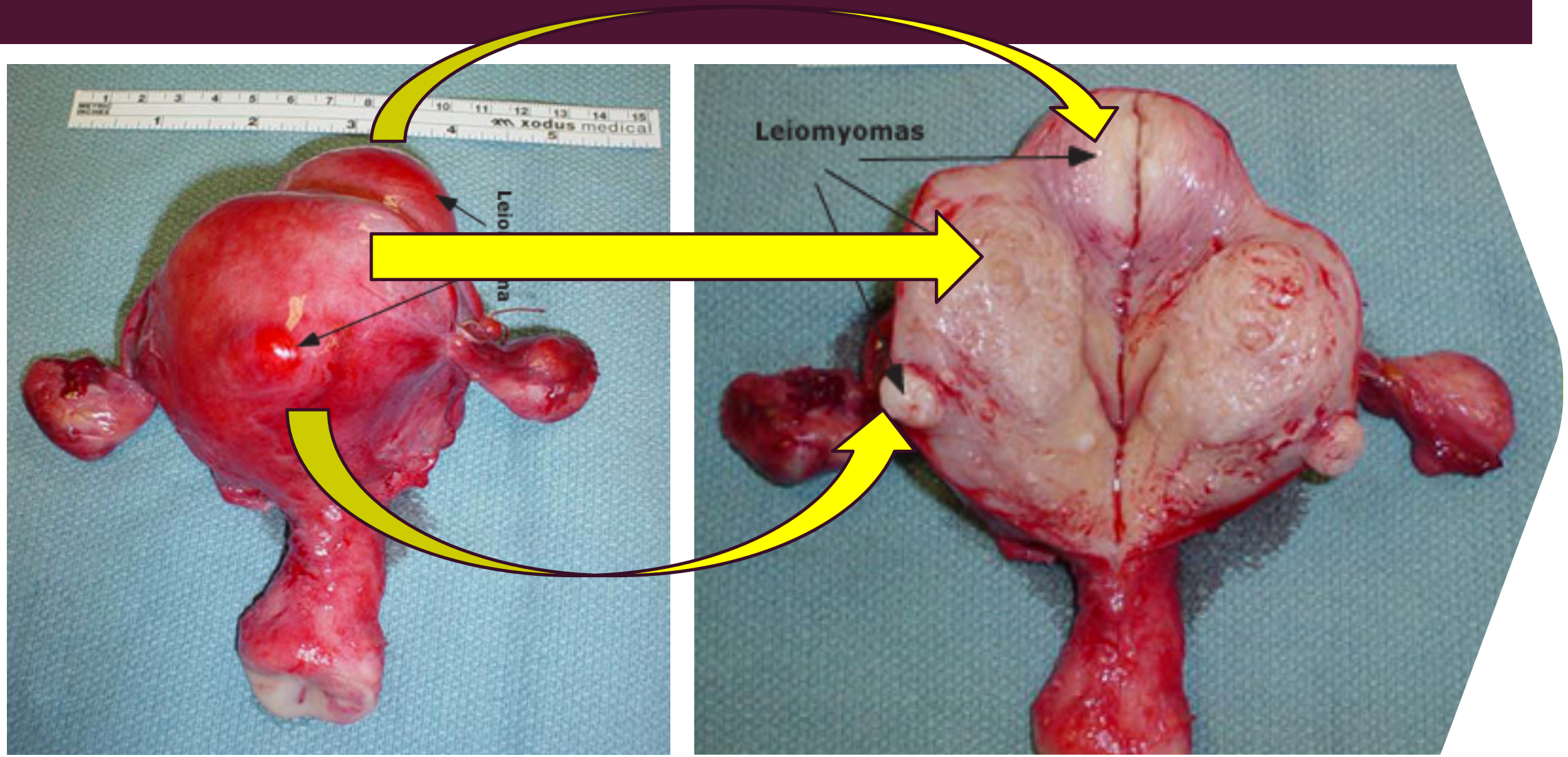
HYSTERECTOMY SPECIMEN



TREATMENT

2. MEDICAL TREATMENT

a. GnRH agonists works by suppressing HPO axis → lowers levels of estrogen and progesterone

b. Selective progesterone receptor modulator: ulipristal acetate

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TREATMENT

3. Other non-invasive treatment modalities:

a. Uterine artery embolization

b. MRI-guided focused ultrasound surgery

c. HIFU (high frequency ultrasound)

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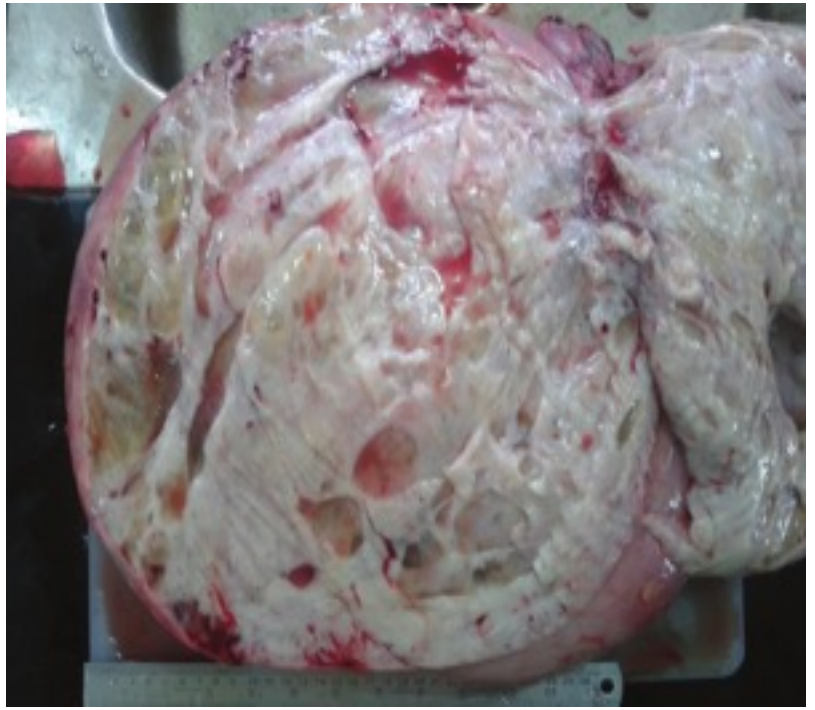
I. COMPLICATIONS: DEGENERATION

- **Degeneration occurs because the tumor outgrows its blood supply (hyaline, myxomatous, calcific, cystic, fatty, red and malignant)**
- **3 most common types being hyaline degeneration (65%), myxomatous degeneration (15%), and calcific degeneration (10%).**

1. Hyaline degeneration -

- The mildest form of degeneration
- The surface of the myoma is homogeneous with loss of the whorled pattern
- Histologically, cellular detail is lost as the smooth muscle cells are replaced by fibrous connective tissue.

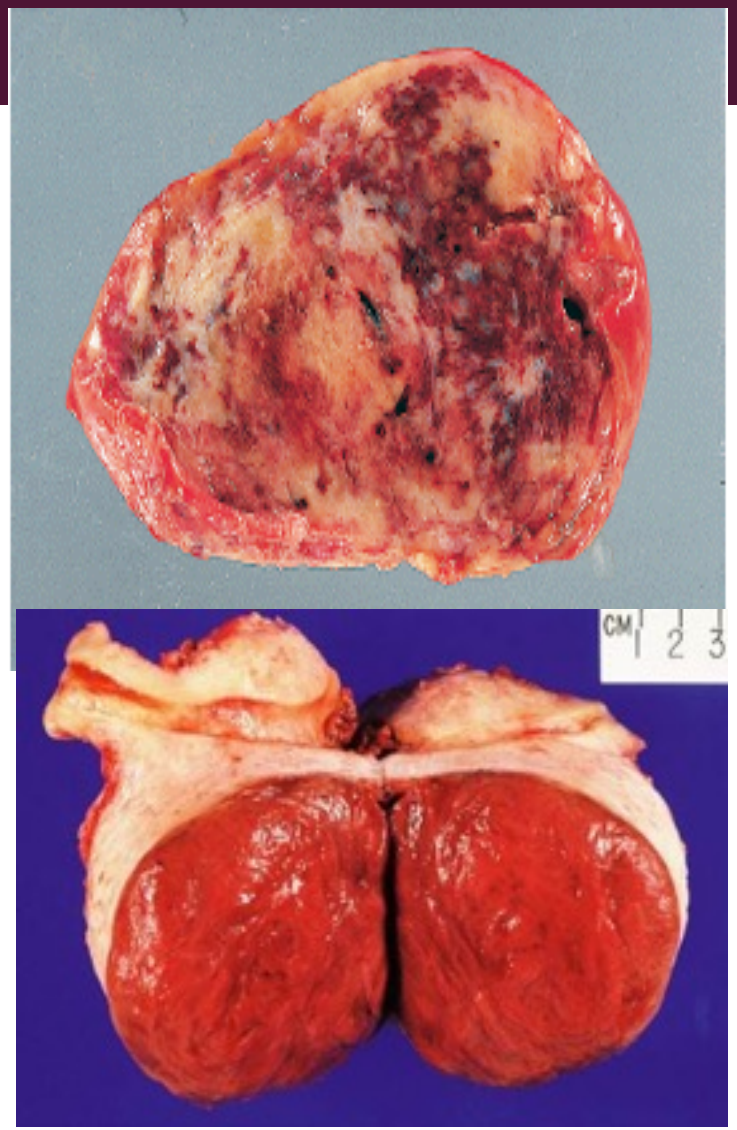


Comprehensive Gynecology, 6th ed. (2012), Lentz GM, Lobo RA, Gershenson DM, Katz VL; Chapters 18 and 19

DEGENERATION

2. Red or carneous degeneration/infarction

- Most acute form
- Causes severe pain and localized peritoneal irritation
- occurs during pregnancy in approximately 5-10% of gravid women with myomas
- best treated with NSAIDS for 72 hours, as long as the woman is less than 32 weeks gestation.



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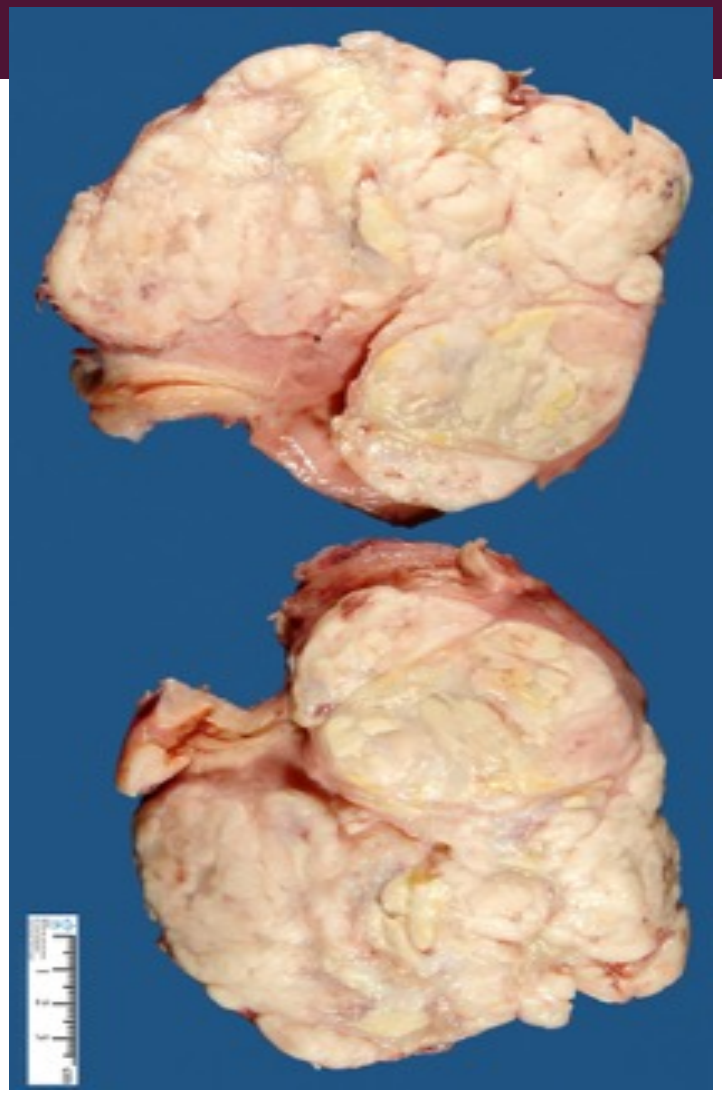
DEGENERATION

- **3. malignant degeneration**
- incidence of malignant degeneration is estimated to be between **0.3% and 0.7%.**
- Sarcomatous degeneration



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2. COMPLICATIONS: INTRAVENOUS LEIOMYOMATOSIS

1. Intravenous leiomyomatosis

- A rare condition in which benign smooth muscle fibers invade and slowly grow into the venous channels of the pelvis
- The tumor grows by direct extension and grossly appears like a **"spaghetti" tumor.**

Comprehensive Gynecology, 6th ed. (2012), Lentz GM, Lobo RA, Gershenson DM, Katz VL; Chapters 18 and 19

3. COMPLICATIONS: LEIOMYOMATOSIS PERITONEALIS DISSEMINATA (LPD)

2. Leiomyomatosis peritonealis disseminata (LPD)

- Benign disease with multiple small nodules over the surface of the pelvis and abdominal peritoneum.
- Grossly, LPD mimics disseminated carcinoma; Associated with a recent pregnancy
- Progestogens, SERMs, or aromatase inhibitors have all been used in management.
- A rare autosomal syndrome of uterine and cutaneous leiomyomata and renal cell carcinoma also exists.
- Renal evaluation in families with this history is important

Comprehensive Gynecology, 6th ed. (2012), Lentz GM, Lobo RA, Gershenson DM, Katz VL; Chapters 18 and 19

CASE SCENARIO

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  - Normal cardiopulmonary and chest findings
  - Speculum: cervix and vagina smooth, (+) active bleeding from os
  - IE: cervix smooth and firm, uterus not enlarged, smooth and moveable, no adnexal masses nor tenderness
  - RVE: smooth and pliable parametria and rectovaginal septum

Diagnostics:

TV ultrasound: submucous myoma, 1.5 cm midcorpus, anterior wall

Hgb 70 mg/dl

Management:

admit → blood transfusion

once stable, patient should undergo hysteroscopic myomectomy

OUTLINE

- Case scenario
- Definition uterine leiomyoma
- Types of myoma
- FIGO classification
- Pathophysiology
- Risk factors
- Symptoms
- Diagnosis
- treatment