# BENIGN TUMORS OF THE UTERUS

## LEARNING OBJECTIVES

**By the end of this lecture, the student needs to:**
- Describe the definition of uterine fibroids.
- Outline the incidence and etiology.
- Recognize the types of fibroids and their degeneration.
- Identify clinical presentations of each type & differential diagnosis.
- Evaluate methods for diagnosis.
- Label treatment options.
- Interpret fibroid effects during pregnancy.

## Uterine fibroids (myoma or leiomyoma)

Commonest pelvic tumor, they are fibromuscular swelling, arising in the muscular layer of the uterus from neoplastic transformation of single smooth muscle cells, benign in nature, they are estrogen dependant.

**Incidence:**
The true incidence is uncertain as many women with these tumors are asymptomatic, they increase with age. Fibroids are clinically apparent in 20-40% during reproductive life and 70% of uteri removed at time of hysterectomy. Fibroids are 2-9 folds more in Afro-Caribbean women, and tend to occur at younger age at Caucasian women.

**Etiology:**
Cause is unknown.
-Occur at the reproductive age where the ovarian hormones level is high.
- Commoner in nulliparous, obesity and low fertility patients.
- Racial and familial predisposition.
- Abnormal estrogen receptor expression.
Reduction in fibroid incidence is seen with:
-Increasing parity
-Prolonged use of oral contraceptive pills
-Smoking

**Pathology:**
Fibroids may be single or multiple, and vary in size. The gross appearance is of a well circumscribed, firm, white-whorled tumor. They are paler than the myometrium with a very sharp line of demarcation between the tumor and normal uterine muscles as a thin layer of areolar tissue forming a pseudo-capsule, through which the blood vessels enter the fibroid, this help dissecting during myomectomy.
Histologically, they are composed of spindle smooth muscles and fibroblasts.
They may arise from normal muscle cells, from immature muscle cells in the myometrium or from embryonal cells in the wall of uterine blood vessels.
They grow very slowly (over years rather than months), under estrogen effect but grow fast in pregnancy, it shrinks after menopause as estrogen is no longer secreted and with antigonadotrophic hormone therapy.

**Types:**

1. Submucus: just below the endometrium, making bulging in the cavity, some times cause menorrhagia, or abortion if implantation of the fertilized ovum occurs on the fibroid, the cavity is distorted and there is a filling defect in the picture of the uterus on hysterosalpingography. Sometimes the fibroid may become pedunculated forming polyps which can even extrude from the cervix.
2. Intramural: the commonest site for fibroids and give enlargement to the uterus
3. Subserous: just beneath the peritoneum on the outer uterine surface, may become pedunculated with a risk of torsion, may grow into the broad ligament. They are sometimes misdiagnosed as ovarian tumor.
- Pedunculated: attached to the uterus by a narrow pedicle containing blood vessels
-Cervical: arise from the cervix
-Fibroids arising separately from the uterus especially in the broad ligament, presumably from embryonal remnants.

**Degeneration:**
1. Hyaline: an aseptic necrosis with loss of muscle cell structure and may lead to calcification. It occurs when the fibroid more gradually outgrows its blood supply.
2. Cystic: a sequel to hyaline degeneration with subsequent break down, central necrosis and cystic formation giving a honeycomb appearance.
3. Fatty: partial necrosis result in the development of fatty substances which may subsequently undergo calcification (visible on X-Rays and Ultrasound).
4. Red: also called necrobiosis usually occurs in mid-second trimester of pregnancy during active growth or the early puerperium, this follows extravasation of blood through the tumor.
5. Sarcomatous: rare malignant changes reported in 0.2 to 0.4 % of fibroids examined in asymptomatic older women at autopsy, extremely uncommon below age of 40. The suspicion is greatest in the postmenopausal period when there is a rapid increase in the size of the fibroid.

**Clinical picture:**
Symptoms depend on size and position.
Symptoms:
1- None, a firm abdominal mass arising from the pelvis at abdominal exam.
2- Heaviness or increase in the abdominal size
3- Pressure, bladder compression causing day time frequency and occasional impaired urinary stream. In the supporting ligament it causes backache and heaviness.
Bowel problems: constipation.
4- Pain associated with red degeneration is sudden with localized tenderness to an area of the uterus with mild pyrexia and leukocytosis. Pain is also seen with torsion of subserous pedunculated fibroid.
5- Dysmenorrhea may indicate the presence of submucous fibroid.
6- Menstrual disturbance: menorrhagia (heavy bleeding) in submucous fibroid distorting the cavity and increasing endometrial surface area and increase uterine vascularity, metrorrhagia (prolonged mens), irregular and postcoital bleeding often associated with polyps and other surface lesions. The patient may become anemic.

7- Subfertility may result from mechanical distortion or occlusion of the fallopian tube, and an endometrial cavity is grossly distorted by submucous fibroids may prevent implantation of a fertilized ovum.
8- Pelvic pain and dyspareunia or sexual intercourse problems in cervical fibroid.

Signs:
The mass may be felt abdominally as a hard mass arising from the pelvis, bimanual examination reveals a hard rounded non tender mass, moving when the cervix is displaced. Speculum examination reveals polyp.

**Investigations:**
- Ultrasound: to define the location, the dimensions and consistency
- Magnetic resonance imaging (MRI)
- Hysterosonography & Hysterosalpingography
- Hysteroscopy

**Differential Diagnosis:**
1. Pregnancy, particularly if the fibroid is softened by cystic degeneration.
2. Ovarian tumor, often cystic, and does not move with cervical displacement.
3. Adenomyosis, more commonly causes uniform diffuse and tender uterine enlargement.

**Treatment:**
**Conservative management:**
If small and asymptomatic, conservative management with annual examination and ultrasound monitoring of size is sufficient. This is especially used in women over 40 yrs because fibroid do not grow after menopause and may shrink.
Menstrual or pressure symptoms rarely may need surgery.
Pain requires analgesia.

**Medical management:**

**Non-hormonal therapy:**
Non-steroidal anti-inflammatory drugs (NSAID) may be beneficial for pain associated with degeneration but not for heavy menstrual bleeding (HMB), tranexamic acid is preferred to NSAID.

**Hormonal therapy:**
**Combined oral contraceptive pills (COCPs)** have limited effectiveness in the control of HMB associated with fibroid and reports on possible increase of fibroid size by its estrogen effect.

**Levonorgestrel-releasing intrauterine system (LNG-IUS)** is beneficial in cases associated with HMB but there should be no cavity distortion and uterus less than 12 weeks since this may increase the chance of expulsion.

**Progestogenes** do not shrink fibroid size but may relieve HMB at high dose.

**Antiprogesterone (mifepristone)** may reduce HMB on the short term only.

**Selective progesterone receptor modulators (SPRMs) Ulipristal acetate** is effective for controlling HMB and shrinkage of fibroid, they do not lead to estrogen deficiency. Ulipristal acetate inhibits neovascularization, cell proliferation and cell survival in the fibroid but not the surrounding myometrium. Side effects are headache, breast tenderness and unopposed estrogen stimulation of the endometrium and endometrial thickening, therefore it is licensed for short term treatment prior to hysterectomy, more data about safety with long term use are needed.

**GnRH analogue** - Limit place by GnRH agonist which suppress the hypothalamic, pituitary, ovarian axis and lead to shrinkage of the fibroid and relieve HMB, but when ovarian function returns the fibroid re-grow to their previous dimensions, therefore can be used temporarily if surgery is to be postponed for some time, it is useful adjunct to surgery for large fibroids where uterine shrinkage may result in transverse abdominal incision rather than longitudinal and vaginal hysterectomy rather than abdominal.
They are used for 3 months prior to hysterectomy or myomectomy to reduce the bulk and vascularity of the fibroid but they obscure tissue planes around the fibroid making myomectomy more difficult. In addition, GnRH analogue produces hypo-estrogenic state with further bone loss and osteoporosis.

**Surgical management:**
Heavier and longer periods are the commonest indication for surgery; other indications for surgery include: fibroids affecting fertility by distorting the cavity, lower cervical fibroids complicating childbirth and rapidly growing fibroids suggesting sarcomatous changes.

**Myomectomy** - preferred in young women whose families are incomplete and when there is personal desire to retain the uterus and to treat HMB. The operation is bloody and the consent of the patient to proceed to hysterectomy should be obtained before starting the operation, the postoperative period may be stormy and the late complication may be adhesions and fertility problems. If the uterine cavity was not opened during myomectomy, then the woman can consider vaginal delivery. In 5% of women the fibroid recur, or continue to have menorrhagia, which necessitate the use of medications, hysteroscopic resection or hysterectomy.

**Hysteroscopy**- hysteroscopic removal of a fibroid is done in patients with menorrhagia and submucous fibroid or fibroid polyp, it is effective in resolving HMB and improve fertility.

**Hysterectomy**- The choice of surgical treatment is determined by the patient complaint, age and fertility; it is suitable if family is completed with women over 40.
Abdominal hysterectomy – performed when the uterus is grossly enlarged and distorted by multiple fibroids.
Vaginal hysterectomy – performed when fibroids are small and few in number and there is an associated prolapse of the uterus.

**Radiological management:**

**Uterine artery embolization:**
Under radiological guidance, a catheter is passed through the femoral artery and advanced to the uterine artery which is obliterated by particles of polyvinyl alcohol. It is

performed by interventional radiologist. The blood supply in the normal myometrium renews itself via the rich collateral circulation from ovarian and vaginal arteries while the fibroid does not, this leads to shrinkage of the fibroid.
It avoids general anesthesia and surgery. The overall shrinkage in fibroid size and reduction in menstrual blood loss around 50%, patient require analgesia for post-operative pain after arterial occlusion. Complications are groin injuries, fever, infection, fibroid expulsion (cervical or submucous), further treatment by other modalities and potential ovarian failure (radiation exposure to the ovaries). Up to one third of women will require further intervention because of lack of symptom control and pregnancy outcome is less favorable compared with myomectomy.

**MRI-guided transcutaneous focused ultrasound (MRg-FUS):**
This technique uses a high-frequency, high-energy ultrasound beams to destroy fibroid tissue by coagulative necrosis, in conjunction with MRI thermal mapping system to visualize the anatomy and monitor the temperature of tissue, it causes tissue destruction by thermal effects and direct damage to lesion's blood vessels. It is an outpatient procedure done under light sedation with low morbidity but it may result tissue injury and burn to skin and nerves and not suitable to fibroids close to bowel and bladder. It is not suitable for large fibroids.
Its effectiveness and safety needs further study.

**Transcervical ultrasound-guided radiofrequency ablation:**
It destroys fibroid through thermal ablation but also is effectiveness and safety needs further study.

**Fibroids and pregnancy:**

The prevalence of fibroid complicating pregnancy is 1:200, but the majority is small and asymptomatic. The complications depend on the number, size and position of the fibroids inside the uterus.

**Effect of pregnancy on the fibroid:**

The increased vascularity of the uterus and circulating levels of estrogen, both with lead to increase in the size and softening of the fibroid. When the fibroid grows too fast; it may outstrip its blood supply leading to degenerative changes and necrobiosis (red degeneration). The patient will present with pain and low-grade fever, usually in the second quarter of pregnancy, the fibroid becomes tender on examination. It is treated by analgesia and the pain will resolve within few days and pregnancy continues.

**Effect of fibroid on pregnancy:**

Implantation on the fibroid may lead to spontaneous abortion.
Pain may develop from red degeneration.
Premature labor may develop if the fibroids are large and multiple.
Dysfunctional uterine contractions may follow the interruption of smooth waves of electrical stimulation by masses of inert, non myometrial tissue.

The cavity of the uterus may be distorted by large fibroid leading to malpresentations and malposition.
The pelvis may be obstructed causing obstructed labor and preventing vaginal delivery.
This is unusual because most fibroids usually move up as the uterus grows in pregnancy.
Postpartum hemorrhage and retained placenta are more common
Rupture of uterus in labor if the cavity is breached during myomectomy.

**Management**:
Management in pregnancy is conservative.
The aim is vaginal delivery, especially if the tumor is in the upper segment of the uterus.
If cesarean section is needed the incision should be maneuvered around the fibroid.
They should not be removed or incised as severe hemorrhage may develop leading to the need for a hysterectomy.