



មជ្ឈមណ្ឌលជាតិគាំពារមាតា និងទារក
National Maternal and Child Health Center

វិវាសល្យសាស្ត្រ សម្ពុត និងរោគស្រ្តី លើកទី៤

ប្រធានបទ៖ «រួមគ្នាបង្កើនគុណភាពសេវាព្យាបាល ថែទាំ និងសង្គ្រោះមាតា និងទារក »

Standardized Ultrasound Evaluation of Uterine Fibroids: FIGO Classification



003451

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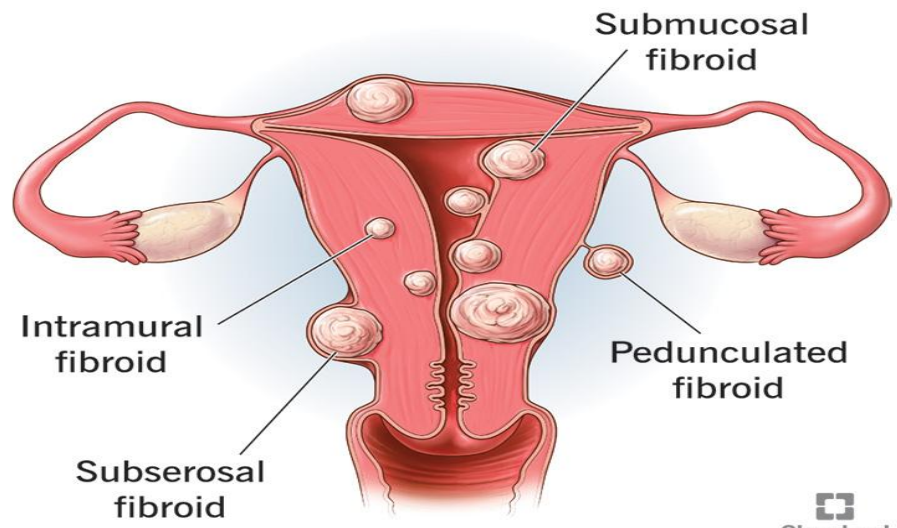
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01. Introduction

Definition

Fibroids (uterine leiomyomas) are benign tumors of the uterus composed of smooth muscle and fibrous connective tissue. They are the most common pelvic tumors in women, typically arising during reproductive years, and can vary in size, number, and location within the uterine wall.

Uterine fibroids



ULTRASOUND FEATURES OF UTERINE FIBROIDS

a solid, round, well-defined, hypoechoic, heterogeneous lesion within the myometrium, often showing acoustic shadowing at the edge of the lesion, with or without internal fan-shaped shadowing.

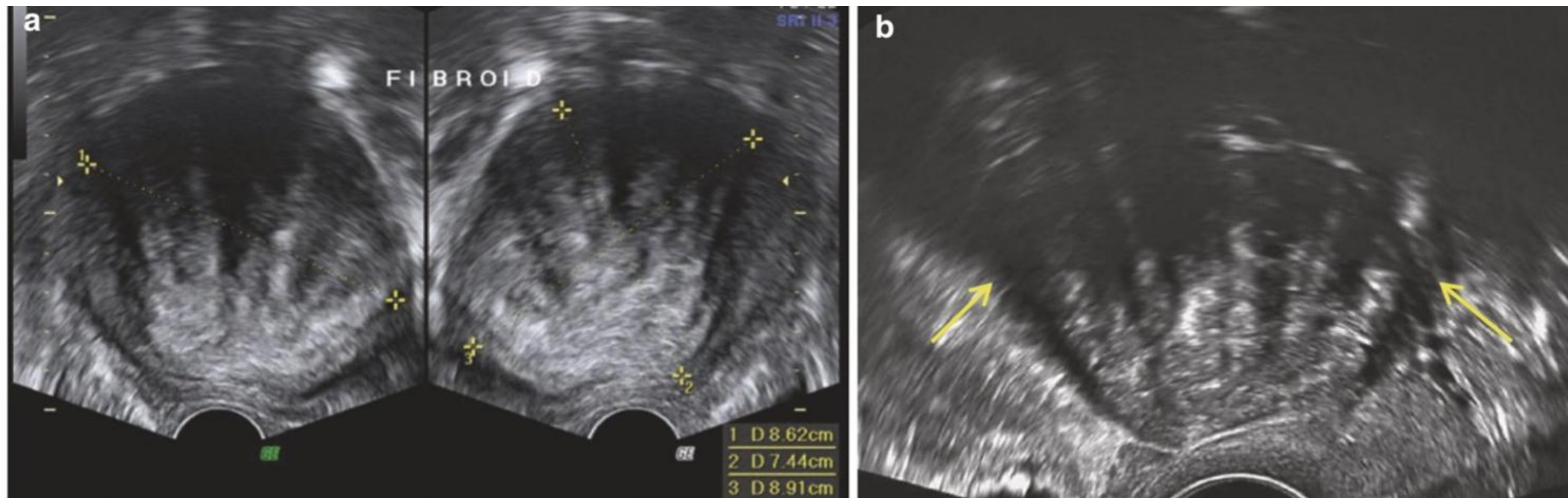


Fig. 3.11 Typical fibroids (a, b) are seen on ultrasound as well-demarcated, solid masses with stripy, linear, fan-shaped, internal shadowing and shadowing from their edges (*arrows*)



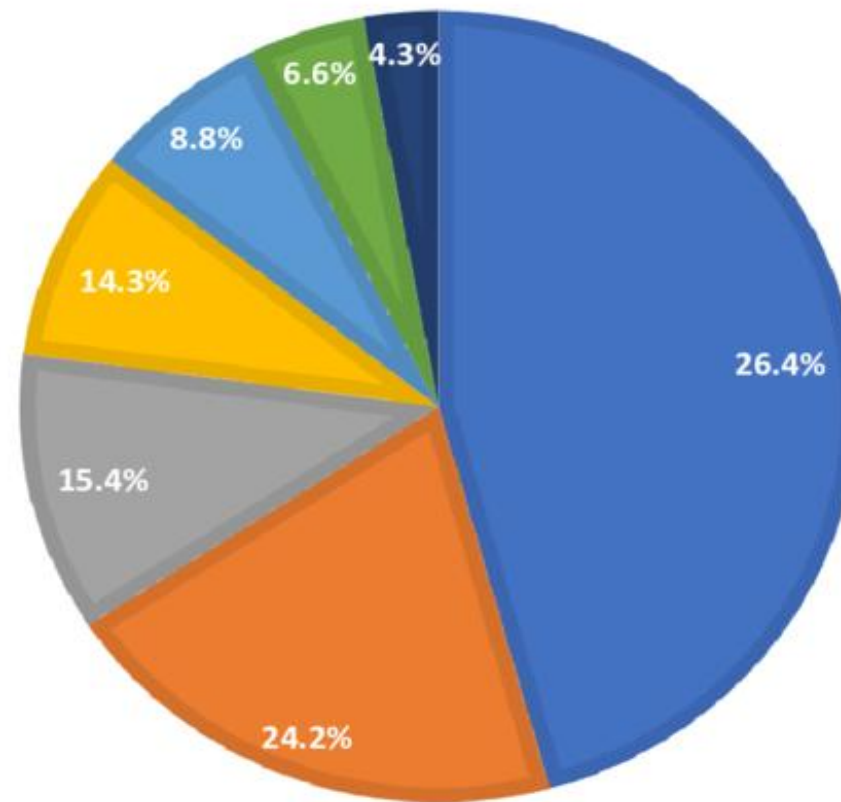
Introduction

Age group prevalence of uterine fibroids

Prevalence of uterine fibroids

How common uterine fibroids are in the population?

■ AGE (31-35) ■ AGE (36-40) ■ AGE (41-45) ■ AGE (26-30) ■ AGE (46-50) ■ AGE (18-25) ■ AGE (51-55)

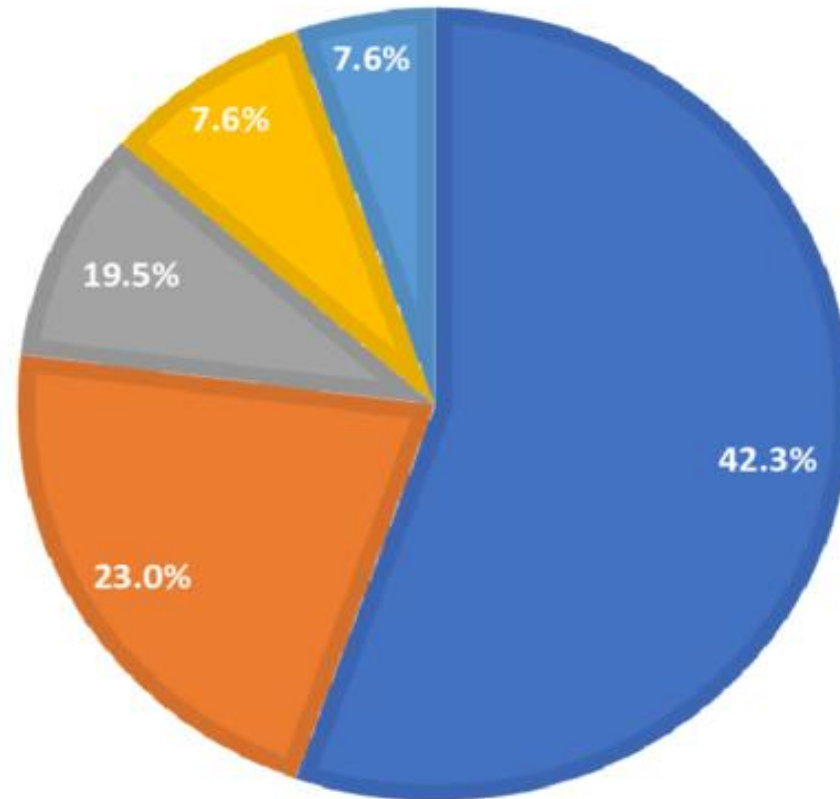




Introduction

Types of fibroids

■ ANTERIOR WALL ■ ANTERO-FUNDAL WALL ■ ANTERIOR & POSTERIOR WALL
■ POSTERO-FUNDAL WALL ■ POSTERIOR WALL





Introduction

Symptoms: Heavy bleeding, pelvic pain/pressure, bloating, urinary/bowel issues, mainly FIGO 0–3

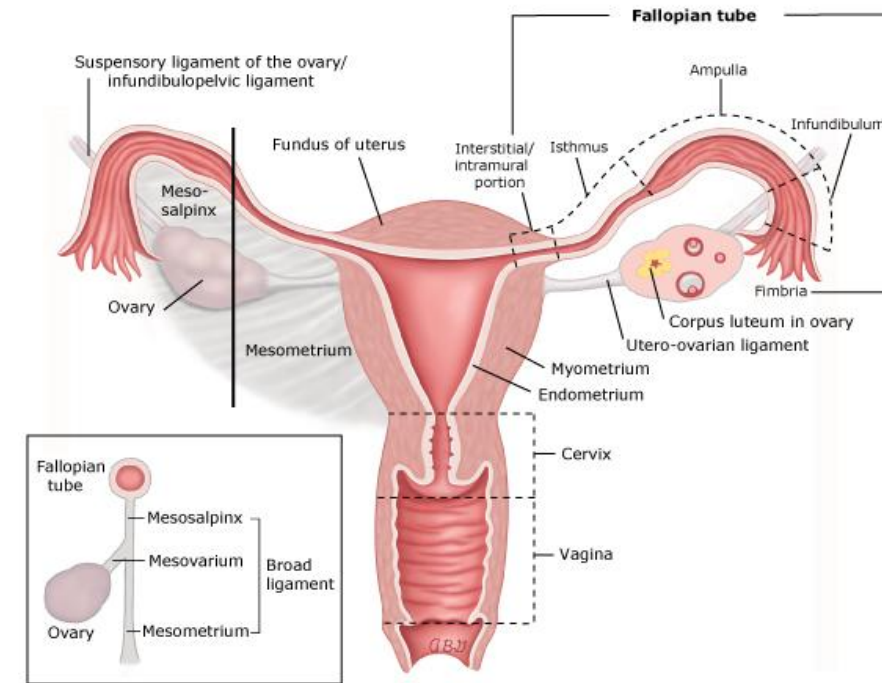
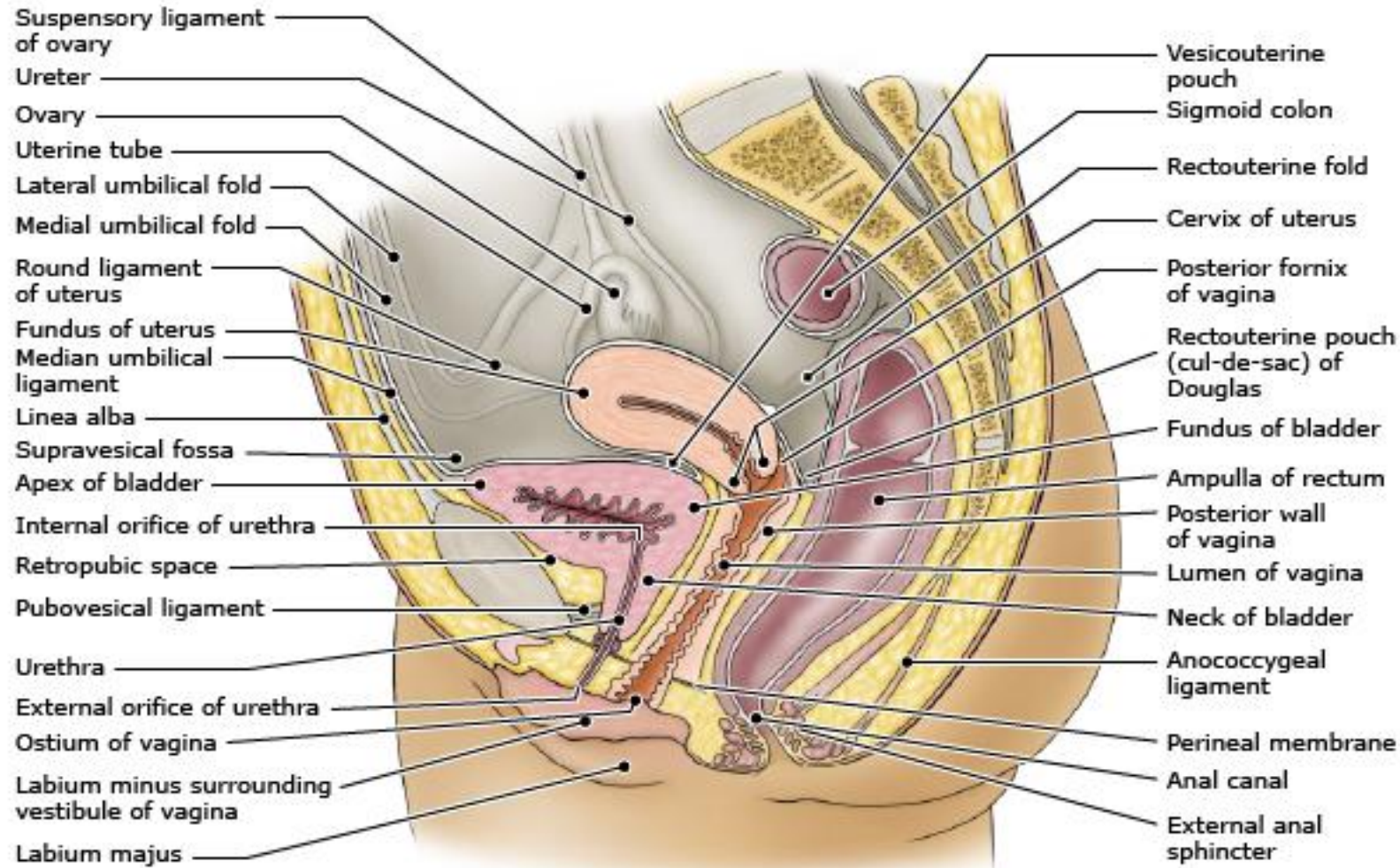
Fertility: Endometrial/cavity-distorting fibroids may impair implantation

Treatment: FIGO type helps guide management planning

Why imaging matters



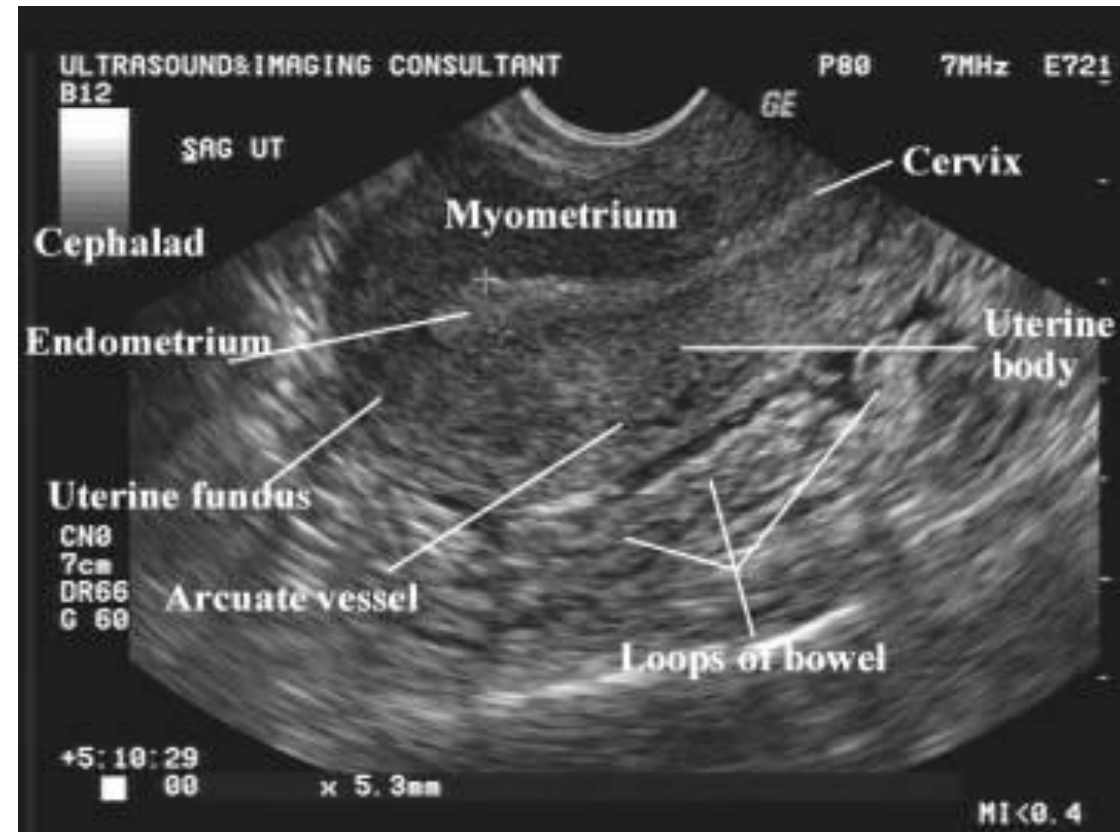
02. Uterus Anatomy



02. Uterus Anatomy (Ultrasound)



Transabdominal US



Transvaginal US



03. Role of Ultrasound in Fibroid Evaluation

Advantages: availability, cost, real-time, Doppler

- **First-line modality**
- **Availability & cost:** Widely available and inexpensive
- **Real-time assessment:** observe movement/deformation
- **Doppler:** Evaluates vascularity, predicts treatment response (e.g., UAE)
- **Patient comfort:** Quick and well-tolerated
- **Portability:** Usable at bedside or outpatient clinics
- **Recommended before MRI**



04. The Need for Standardized Classification

Importance for management planning

- **Guides surgical route:** Identifies whether hysteroscopic, laparoscopic, or open surgery is most appropriate.
- **Predicts complexity:** Depth of intramural extension signals risk of bleeding and operative difficulty.
- **Supports fertility goals:** Highlights submucosal fibroids (Types 0–2) that most affect fertility and miscarriage risk.



04. The Need for Standardized Classification Communication between radiologists and gynecologists

A clear report helps the gynecologist understand:

Number, size, and location of fibroids

Relationship to endometrium and serosa (FIGO type)

Any features affecting surgery (e.g., pedunculated, vascularity)



05. FIGO Classification System (0–8)

How FIGO is Structured

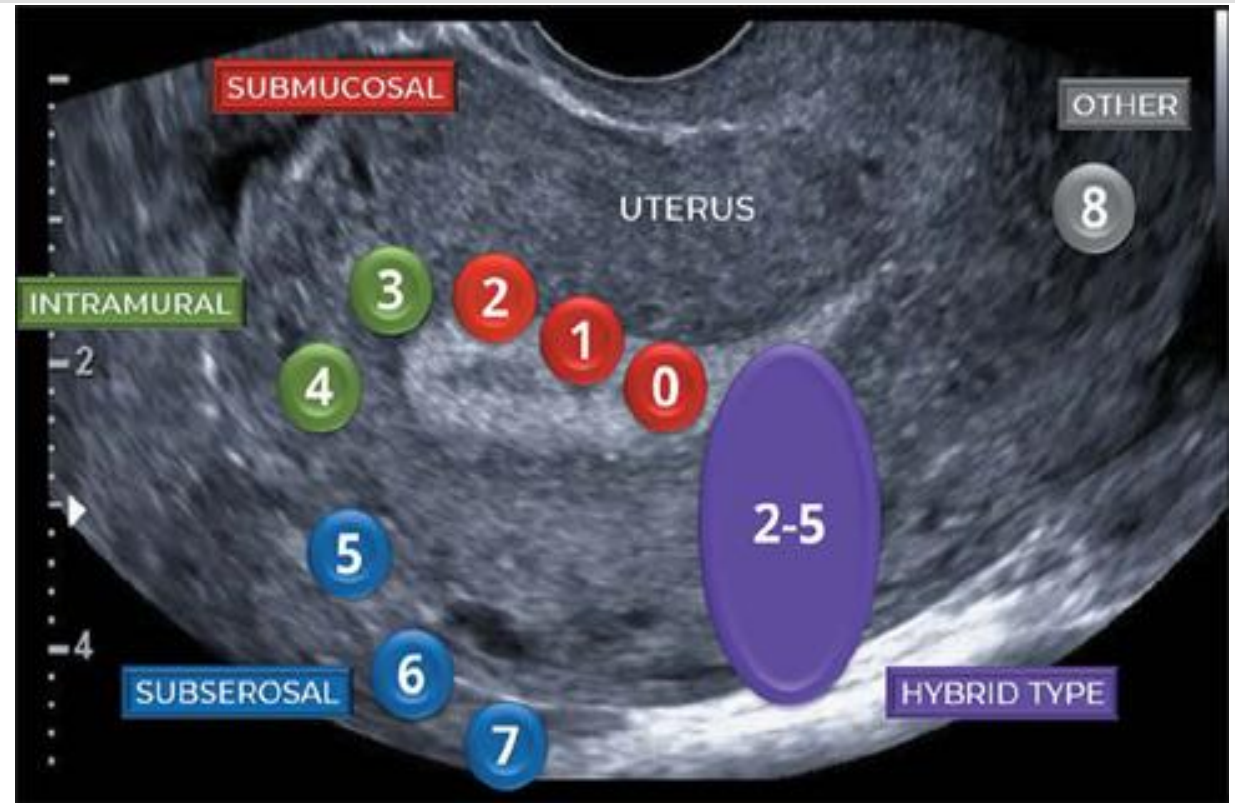
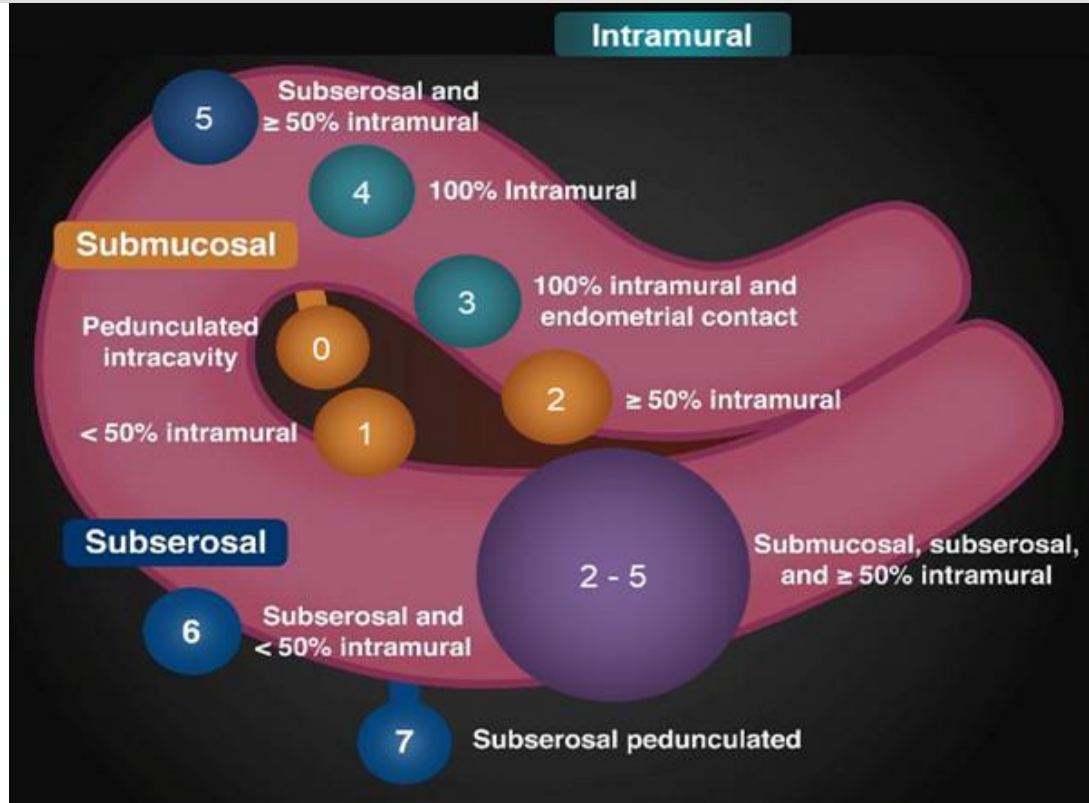
Numeric types 0–8: Each number corresponds to a fibroid's position relative to the endometrium and serosa.

Submucosal group (0–2): Fibroids protruding into the uterine cavity.

Intramural group (3–4): Fibroids within the myometrium, with or without contact with the endometrium.

Subserosal group (5–7): Fibroids projecting outward toward the serosal surface.

Other group (8): Cervical, parasitic, or atypical fibroids.

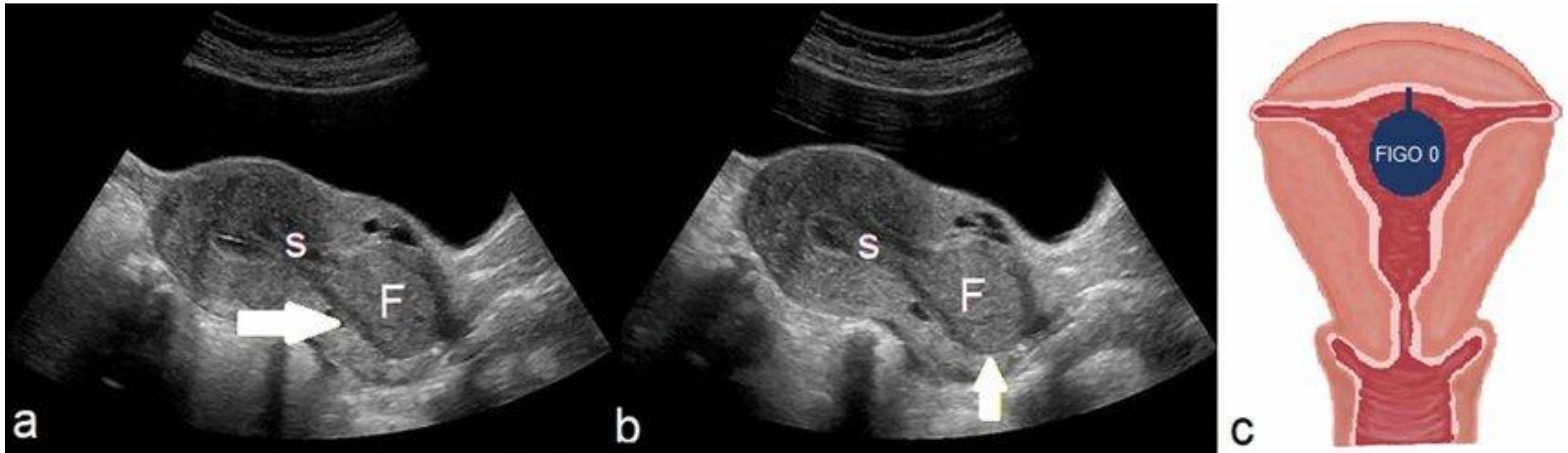


FIGO classification of fibroids:

- 0 = pedunculated intracavitary fibroid
- 1 = submucosal fibroid that is $< 50\%$ intramural
- 2 = submucosal fibroid that is $\geq 50\%$ intramural
- 3 = fibroid that is 100% intramural but in contact with the endometrium
- 4 = intramural fibroid

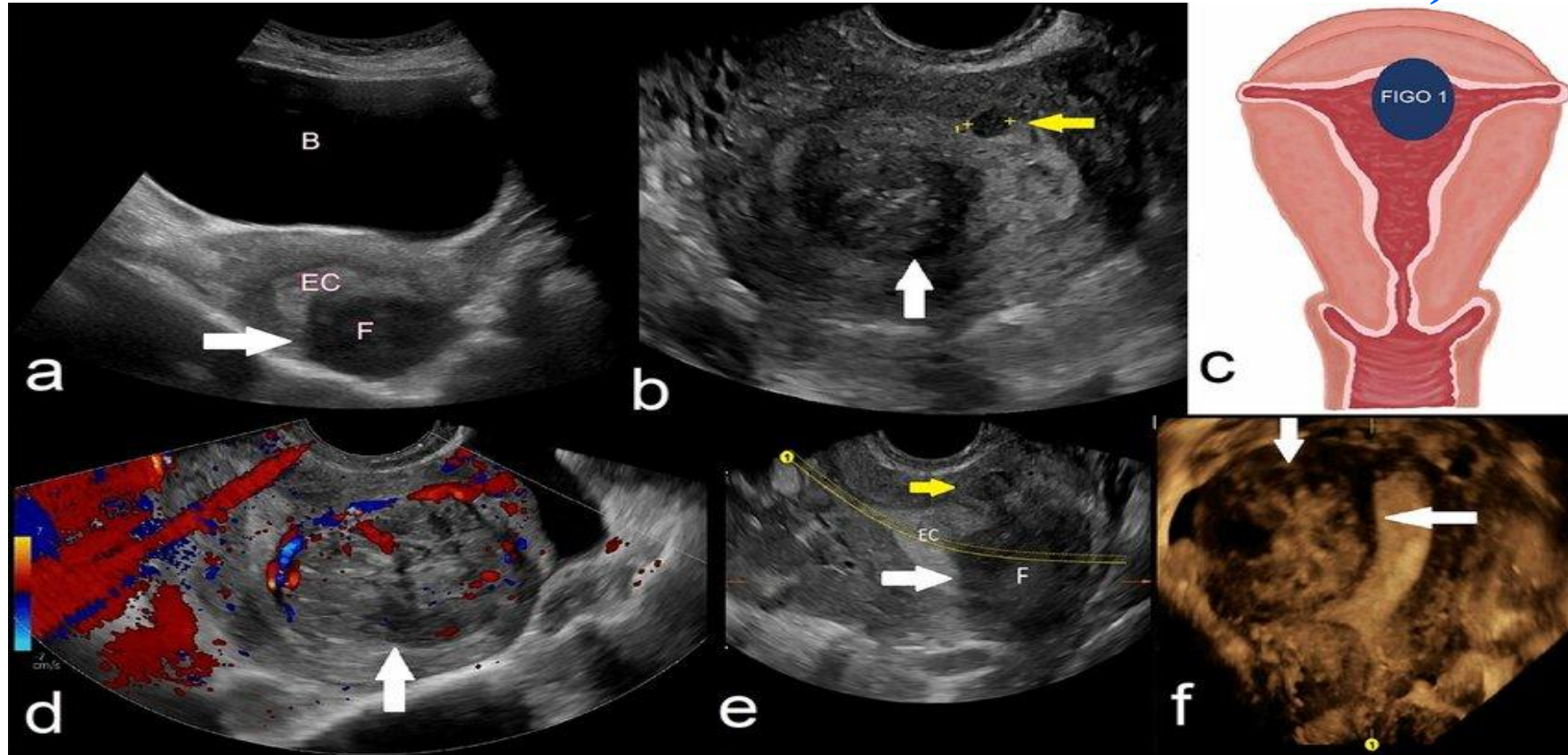
- 5 = subserosal fibroid that is $\geq 50\%$ intramural
- 6 = subserosal fibroid that is $< 50\%$ intramural
- 7 = sub-serosal pedunculated fibroid
- 8 = other (e.g., cervical and parasitic) fibroids
- 2-5 = hybrid fibroid that is $< 50\%$ submucosal and $< 50\%$ subserosal.

FIGO 0 (Pedunculated intracavitary fibroid)



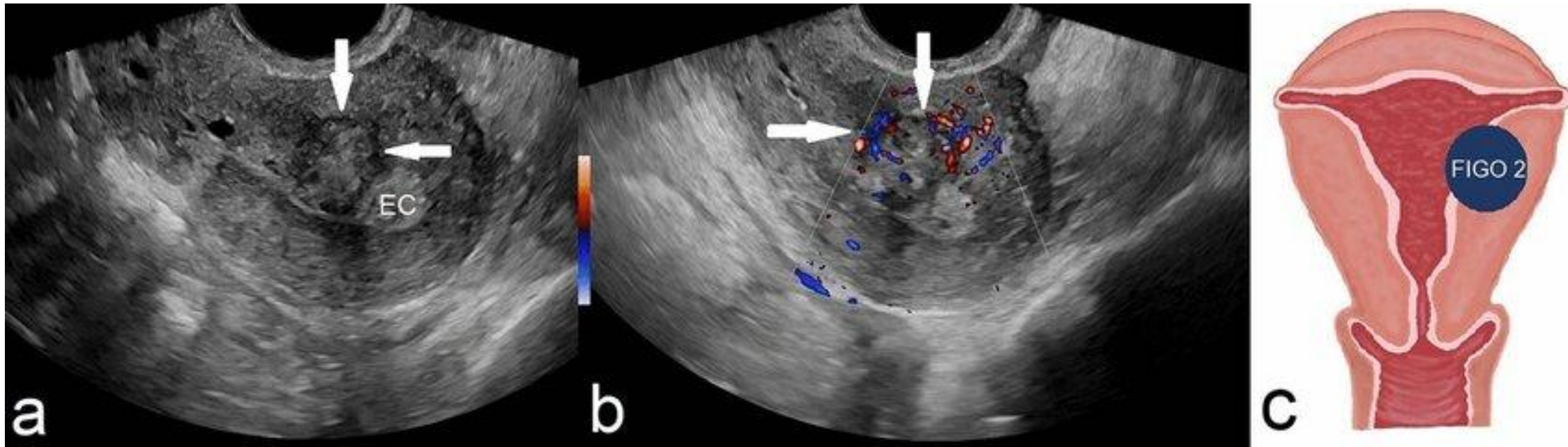
FIGO 0—intracavitary leiomyoma. a, b Transabdominal ultrasound demonstrating an intracavitary leiomyoma (arrow) prolapsing in the endocervical canal with the fibroid (F) and the stalk (s) in the longitudinal view in a 45-year-old-female. c Illustration depicting FIGO 0 leiomyoma

FIGO 1 (Submucosal fibroid that is $< 50\%$ intramural)



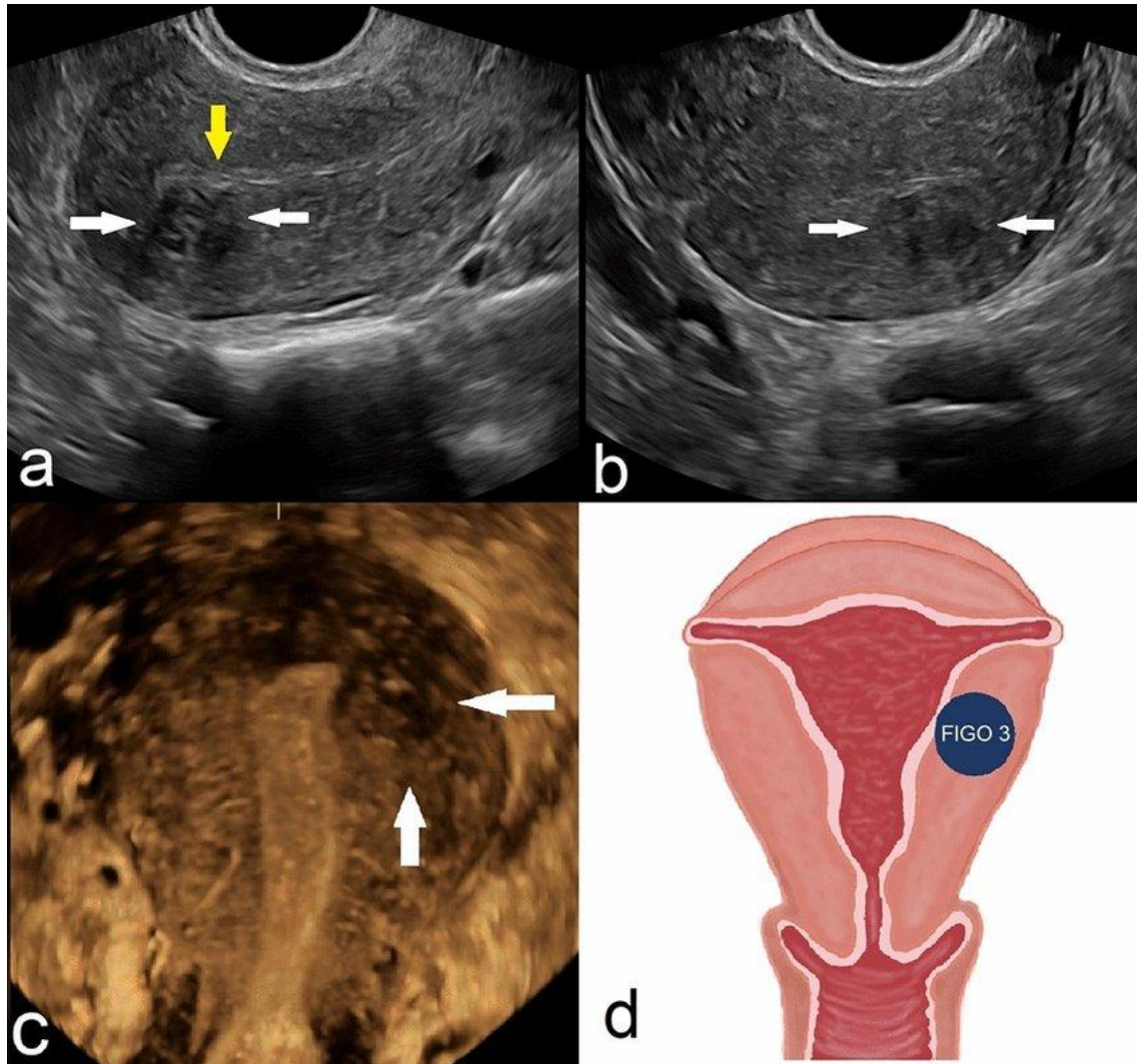
FIGO 1—submucosal leiomyoma with more than 50% submucosal component and less than 50% intramural component. a Longitudinal view on transabdominal ultrasound demonstrating FIGO 1 fibroid (F) (white arrow), endometrial cavity (EC) and urinary bladder (B). b Transverse view on transvaginal ultrasound demonstrating two FIGO 1 leiomyomas (white and yellow arrows). d Longitudinal view on transvaginal ultrasound with color doppler demonstrates the vascular pattern of the mass and e shows splaying of the endometrial cavity (EC) and the relation of the mass with the cavity (yellow lines). f 3-D ultrasound demonstrating the larger FIGO 1 leiomyoma protruding into the endometrial cavity

FIGO 2 (Submucosal fibroid that is $\geq 50\%$ intramural)



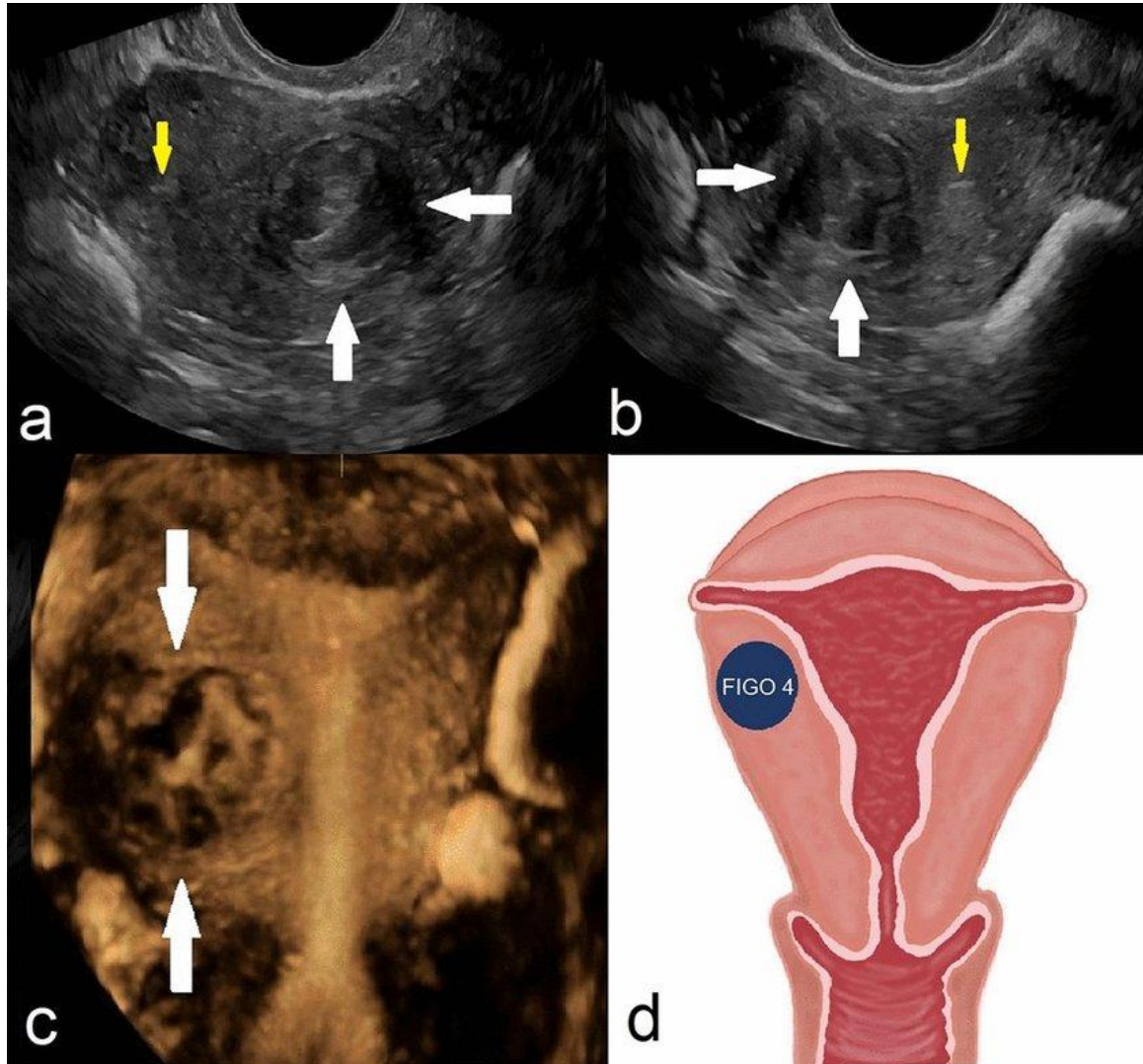
FIGO 2 submucosal leiomyoma with less than 50% submucosal component and more than 50% intramural component. a Longitudinal view on transvaginal ultrasound demonstrating FIGO 2 leiomyoma (white arrows). b Color Doppler demonstrating the circumferential vascularity of the mass.

FIGO 3 (Fibroid that is 100% intramural but in contact with the endometrium)



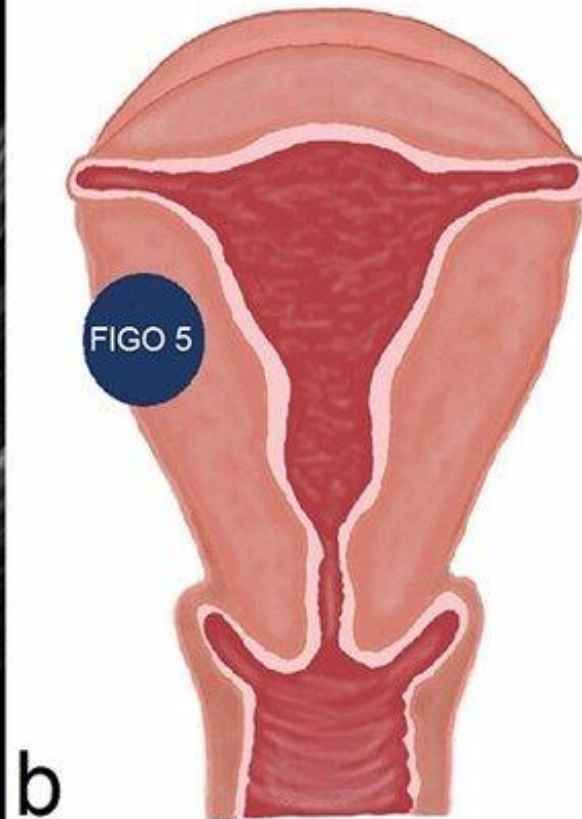
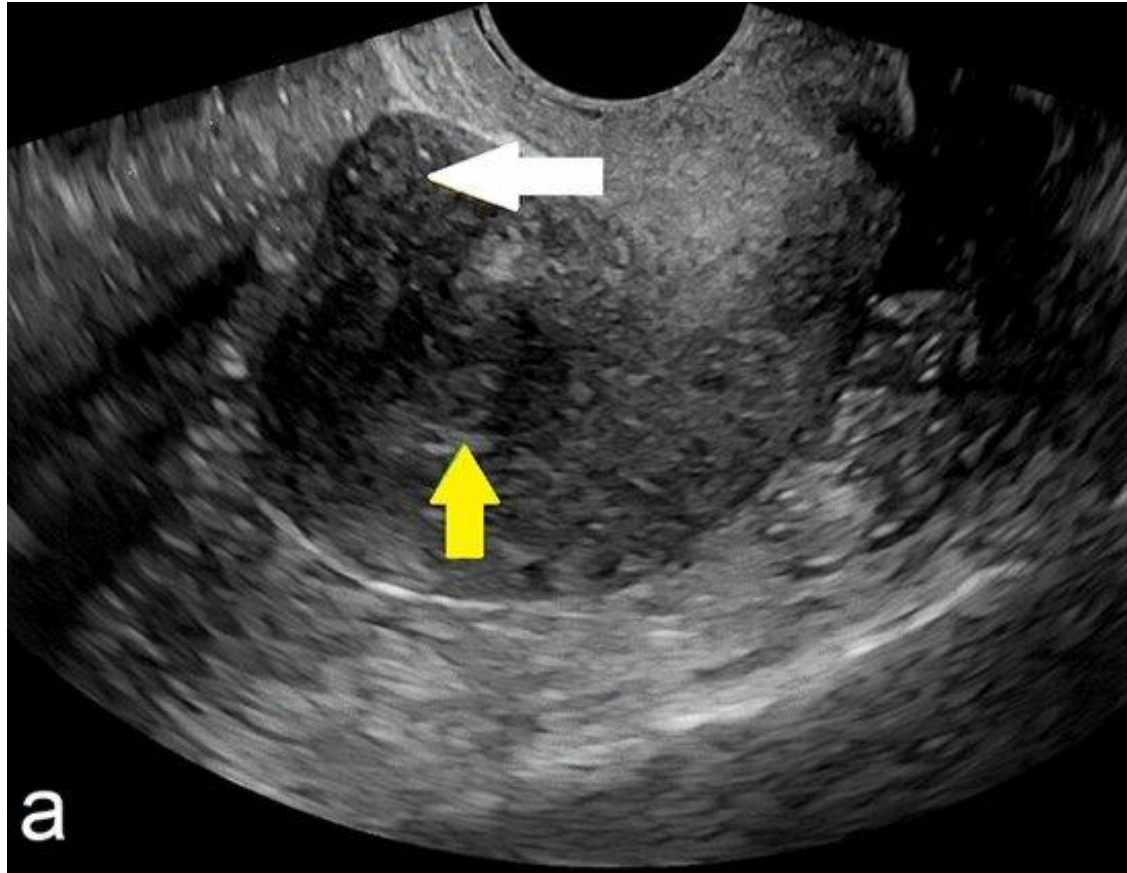
FIGO 3—intramural leiomyoma with endometrial abutment. a Longitudinal view on transvaginal ultrasound demonstrating FIGO 3 leiomyoma (white arrows) and its relation with endometrial cavity (yellow arrow). b Transverse view on transvaginal ultrasound demonstrating FIGO 3 leiomyoma contacting the endometrium, but without any submucosal extension (arrows). c 3D ultrasound demonstrating the relation of the leiomyoma to the endometrial cavity (arrows).

FIGO 4 (Intramural fibroid)



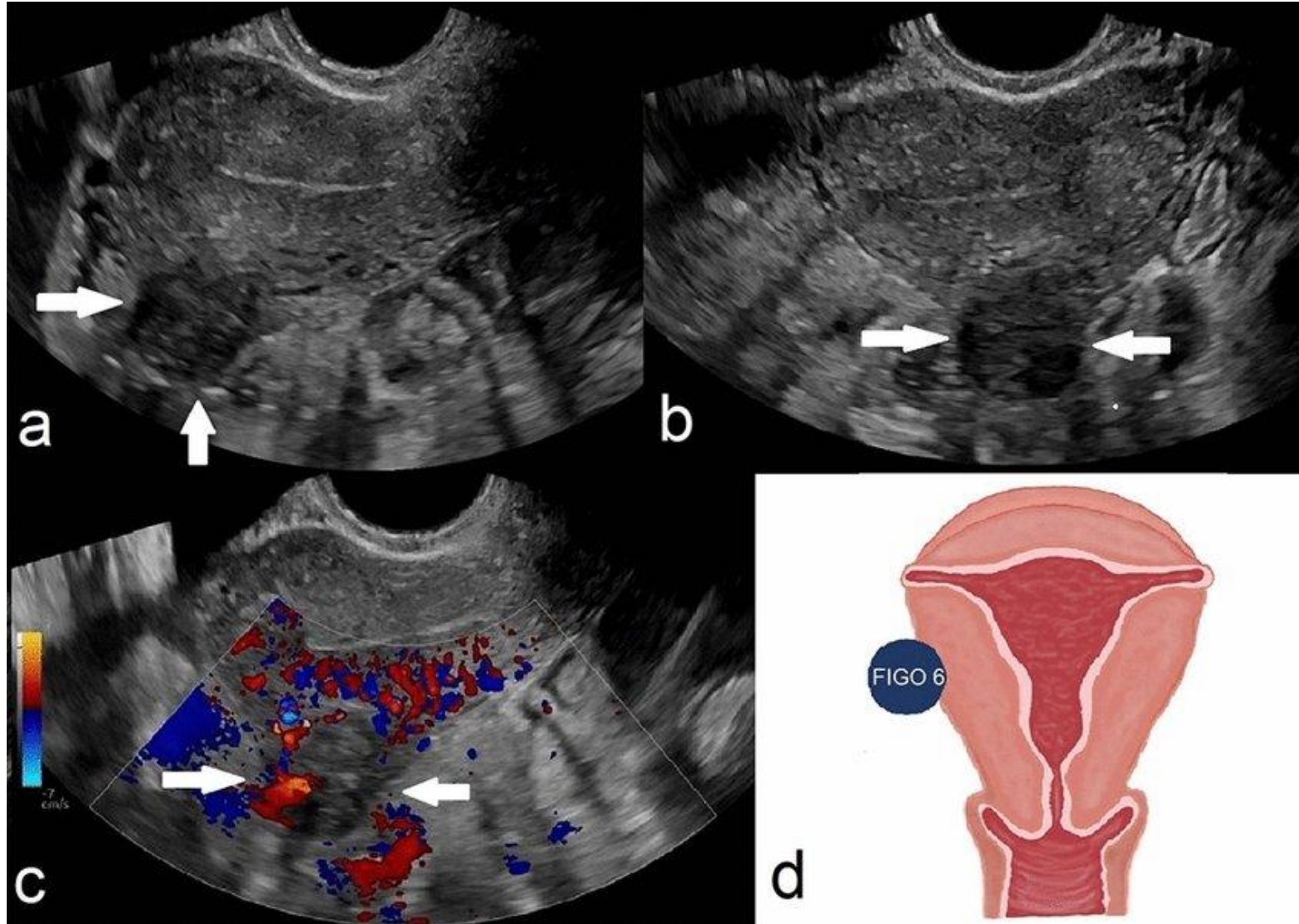
FIGO 4—intramural leiomyoma with no endometrial or subserosal contact.
a Longitudinal and b transverse view on transvaginal ultrasound demonstrating FIGO 4 leiomyoma (white arrows) and the endometrial cavity (yellow arrow).
c 3-D ultrasound demonstrating FIGO 4 leiomyoma. Note that the mass has no contact with the endometrium or the serosa.

FIGO 5 (Subserosal fibroid that is $\geq 50\%$ intramural)



FIGO 5—subserosal fibroid with less than 50% subserosal component and more than 50% intramural component. a Longitudinal view on transvaginal ultrasound demonstrating FIGO 5 leiomyoma (white arrow). In addition, note that a FIGO 2 submucosal leiomyoma with < 50% submucosal component (yellow arrow).

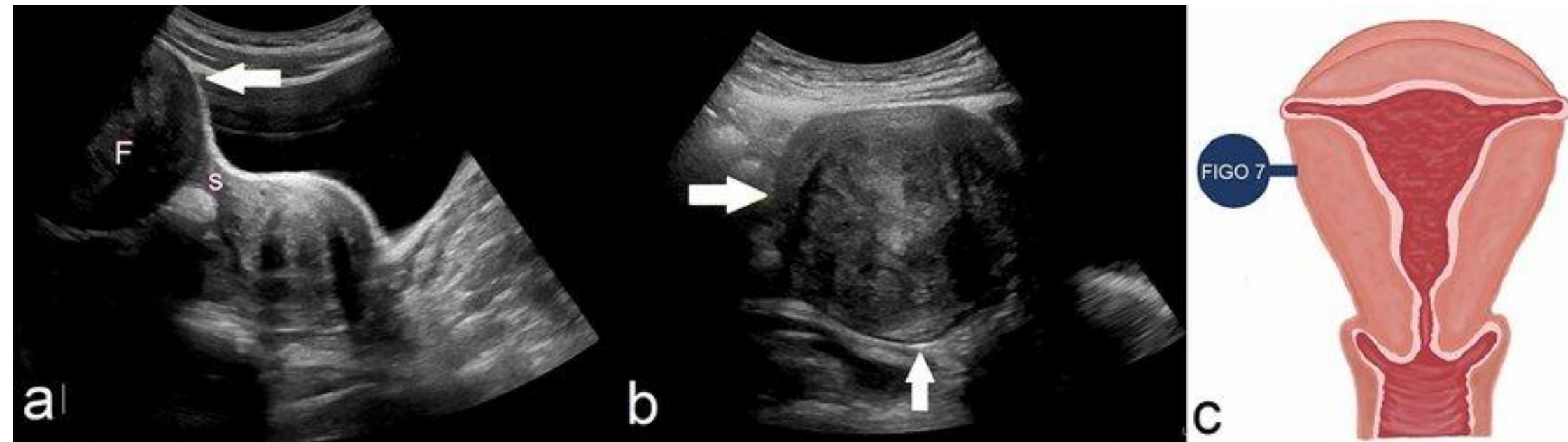
FIGO 6 (Subserosal fibroid that is < 50% intramural)



FIGO 6—subserosal leiomyoma with more than 50% subserosal component and less than 50% intramural component.

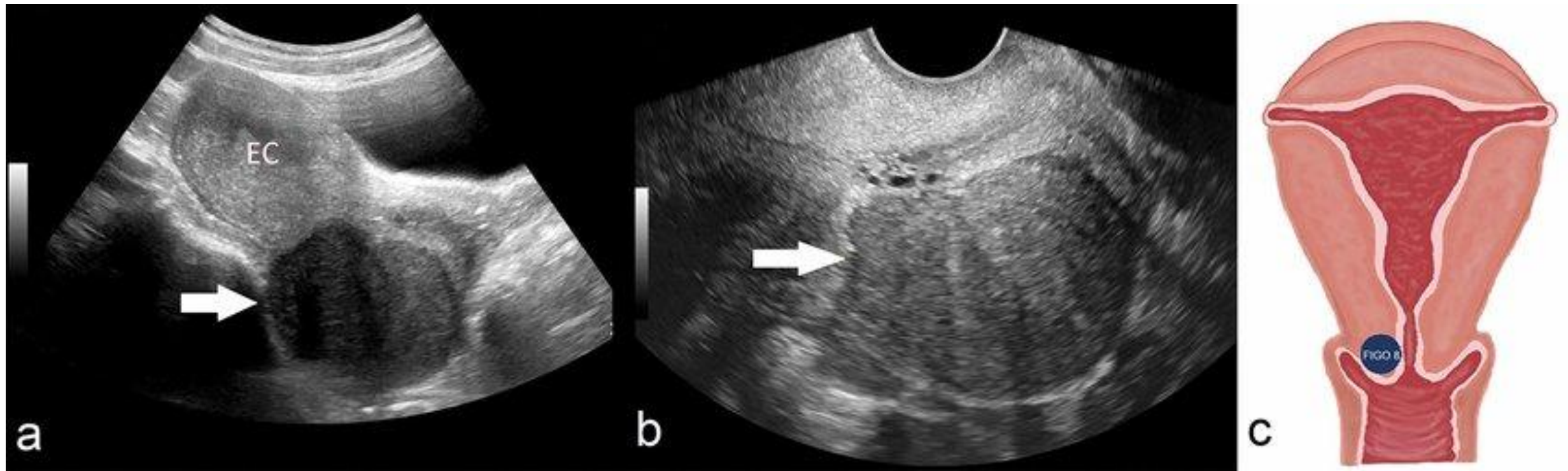
c. Color Doppler demonstrating the vascularity of the mass and surrounding uterine myometrium.

FIGO 7 (Sub-serosal pedunculated fibroid)



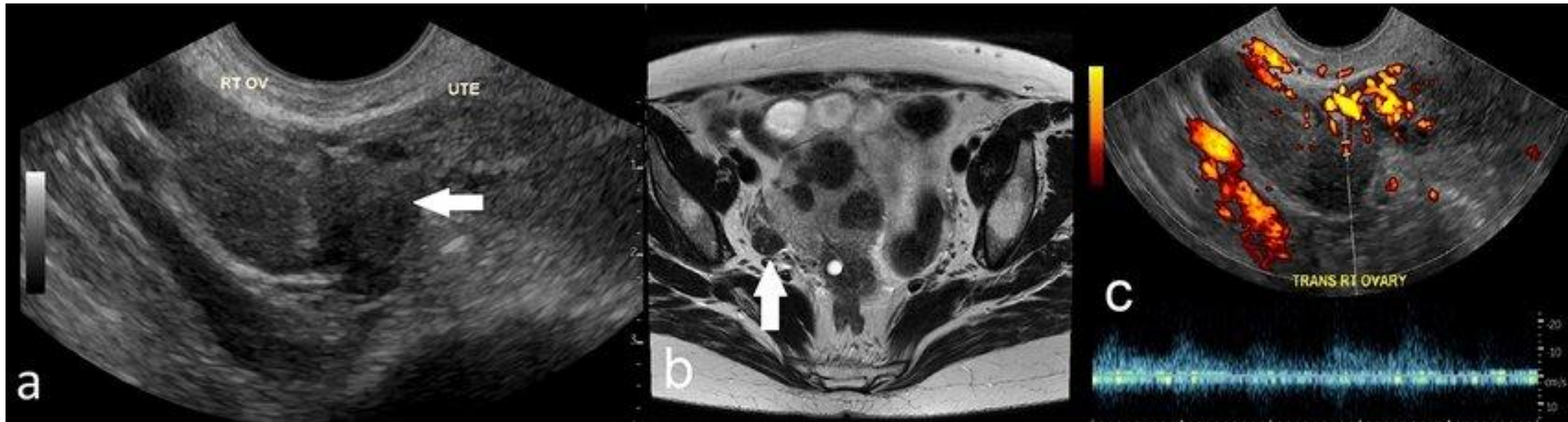
FIGO 7—pedunculated subserosal leiomyoma. a, b Longitudinal view on transabdominal ultrasound demonstrating FIGO 7 leiomyoma (yellow arrow) with fibroid (F) and stalk (s).

FIGO 8 (Other (e.g., cervical and parasitic) fibroids)



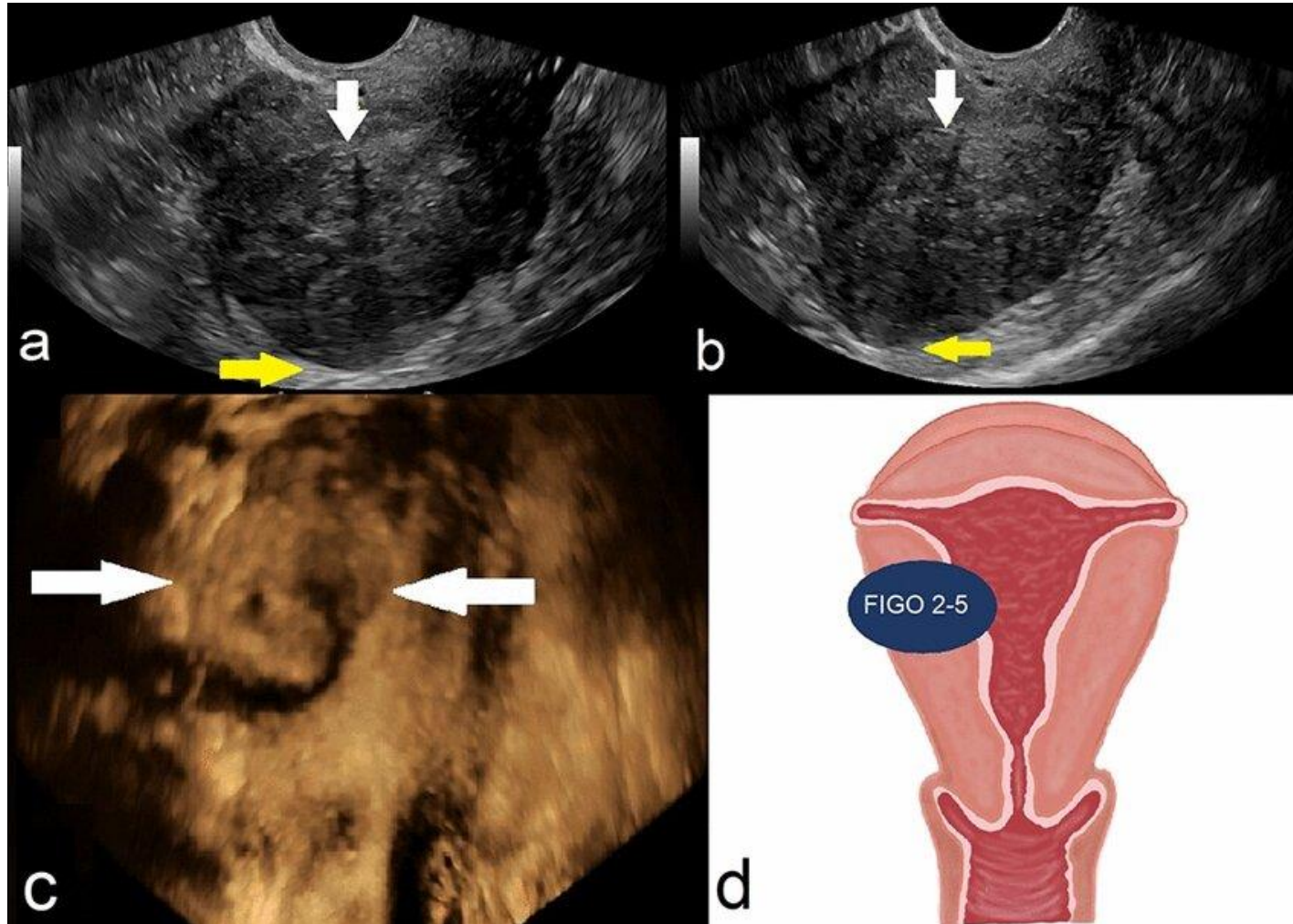
FIGO 8—extrauterine leiomyoma. a Longitudinal view on transabdominal and b transvaginal ultrasound demonstrating a cervical fibroid.

FIGO 8 (Other (e.g., cervical and parasitic) fibroids)



FIGO 8—extrauterine leiomyoma. a Transvaginal ultrasound demonstrating a broad ligament leiomyoma. b Transverse T2WI MRI demonstrating the same broad ligament leiomyoma. Color Doppler ultrasound demonstrating the vascularity of the mass positioned between the uterus and right ovary

FIGO 2-5 (Hybrid fibroid that is < 50% submucosal and < 50% subserosal)



FIGO 2-5 Hybrid leiomyomas. a Transverse and b longitudinal view on transvaginal ultrasound demonstrating a large leiomyoma with endometrial contact (FIGO 3—white arrow) and subserosal component (FIGO 5—yellow arrow). c 3-D ultrasound demonstrating hybrid leiomyoma (2-5) in a different patient extending from the submucosal layer to the subserosal layer (arrows).



06. Essential Ultrasound Reporting Points

- **Number of fibroids**
- **Maximum dimensions**
- **Localization (anterior/posterior, fundus/body/cervix)**
- **FIGO type**
- **Echogenicity**
- **Vascularity (Color Doppler)**
- **Relationship to endometrium and serosa**
- **Associated findings (adenomyosis, endometrial distortion)**



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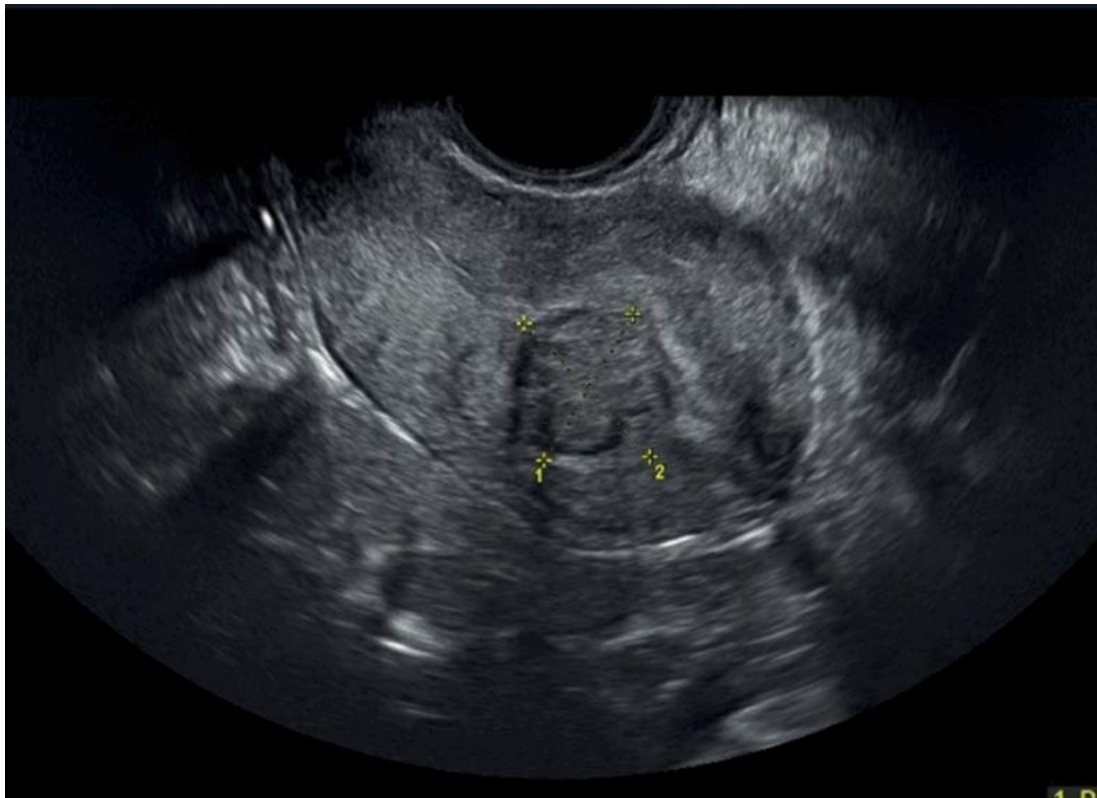
Parameter	Criteria
Uterus	Measurement of length, anteroposterior diameter, transverse diameter, and volume
Serosal contour	Regular or lobulated
Myometrial walls	Symmetrical or asymmetrical
Myometrial echogenicity	Homogeneous or heterogeneous
Myometrial lesions	Margins — Well-defined or ill-defined
	Number of lesions
	Location — Anterior , posterior, fundal, right/ left lateral, or global
	Type — According to the FIGO classification
	Size — Three perpendicular diameters
	Outer lesion-free margin — Distance from the serosal surface
	Inner lesion-free margin — Distance from the endometrial surface
	Echogenicity — Hypoechoic, isoechoic, or hy-perechoic

Michel Santos Palheta, DAS, F., & Roberta, A. (2023). Reporting of uterine fibroids on ultrasound examinations: an illustrated report template focused on surgical planning. *Radiologia Brasileira*, 56(2), 86–94. <https://doi.org/10.1590/0100-3984.2022.0048>

07. Clinical Cases

A 35-year-old woman with secondary infertility undergoes ultrasound evaluation. She reports regular cycles but difficulty conceiving for 18 months. Imaging shows a 3.0 cm intramural fibroid that abuts the endometrium without protruding into the cavity. The lesion distorts the endometrial contour but remains entirely intramural.

Question:
FIGO classification?



Answer:
FIGO Type 3 (Intramural Contacting Endometrium)

- Intramural fibroid contacting endometrium
- No intracavitary component
- Distinction from type 2 (no cavity protrusion)

07. Clinical Cases

A 44-year-old woman presents for routine gynecologic evaluation. She is asymptomatic. Ultrasound incidentally identifies a 5.1 cm well-circumscribed mass entirely within the myometrium. There is no contact with the endometrium or serosa. The uterus is mildly enlarged but cavity morphology is preserved.

Question:
FIGO type?



Answer:
FIGO Type 4 (Purely Intramural)

- Pure intramural fibroid
- No endometrial or serosal involvement
- Common incidental finding

07. Clinical Cases

A 39-year-old woman complains of mild pelvic pressure. Ultrasound shows a 3.7 cm mass projecting from the uterine serosa with minimal intramural attachment (<50%). The lesion is predominantly external and does not distort the endometrial cavity.

Question:
FIGO type?



Answer:
FIGO Type 6 (Pure Subserosal)

- Subserosal with <50% intramural component
- Predominantly external
- May appear pedunculated but remains uterine in origin



08. Pitfalls

1. Misclassification of Type

- Intramural vs submucosal extension unclear (FIGO 2 vs FIGO 3 Confusion)
- Distorted cavity → wrong % estimation
- Poor endometrial interface

2. Multiple / Large Fibroids

- Difficult counting & mapping
- Uterine distortion → typing errors
- Small lesions overlooked

3. Submucosal Component & Polyp Mimic

- Intracavitary fibroid underestimated
- Polyp = single central vessel
- Fibroid = peripheral vascularity + myometrial origin
- Alters treatment choice

4. Pedunculated vs Adnexal Mass

- Subserosal pedunculated fibroid mimics ovarian mass
- Bridging vessels needed (Doppler)

5. Uterus fibroid vs Adenomyosis



09. Limitations

- **Operator-dependent: Accuracy varies with skill**
- **Limited field of view for large/multiple fibroids**
- **Poor visualization in obese patients or with bowel gas**
- **Less precise than MRI for complex, multiple, or deep intramural fibroids**
- **Cannot reliably characterize tissue type (degeneration, necrosis) in all cases**



10. Take Home Message

- Ultrasound remains the first-line imaging modality for uterine fibroids.
- Accurate application of the FIGO classification system on ultrasound is essential for guiding treatment decisions.
- Despite limitations (operator dependency, limited mapping), it remains the cornerstone tool due to availability, cost-effectiveness, and Doppler capability.



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Thanks for your attention.