
بسم الله الرحمن الرحيم

Hints of MRI
GYNECOLOGICAL IMAGING

By

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Many Thanks to Our

Prof. Dr. Mamdouh Mahfoz ,

as His lecture is the main source of This Topic.

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Introduction

Magnetic resonance imaging

HISTORY

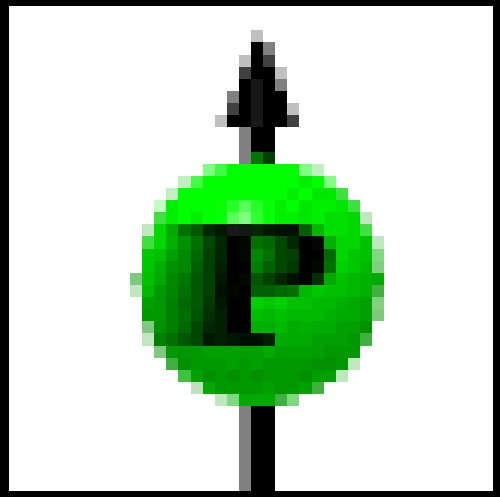
NMR = **N**uclear ***M***agnetic ***R***esonance

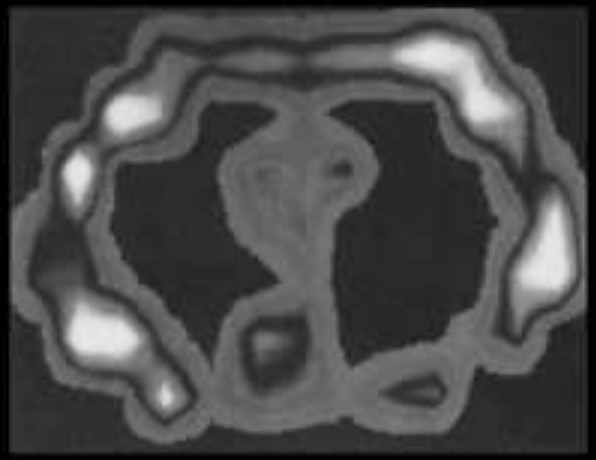
* ***1946*** **:** the phenomenon discovered by ***Purcell & Bloch*** .
* **1952 :** They received *Nobel prize* - physics
* *From this history & NMR techniques in a rapid progression .*

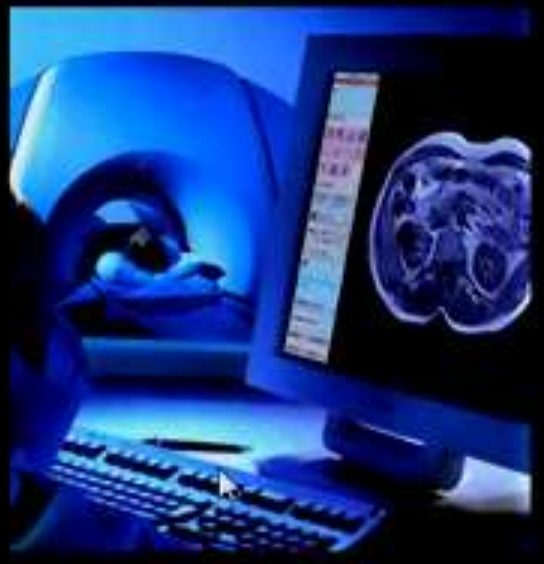
NMR Nobel Prize 1952

Bloch & Purcell

- Hydrogen atoms (H1) is the base for image generation.
- A hydrogen atom =1 *proton* + 1 electron .








corbis

MRI
Open

MRI
Closed

Contraindications Of MRI

No any *Iron* object or *magnetic* enter the room of MR Magnet!!!!

- ***Iron*** Processes.
- Iron F.B.
- Firearm
- Peacemaker.
- Vascular metallic clips.


JANITOR

Contra-indications to MRI


www.MRImetalDetector.com

MRI quench which put an imaging center at risk

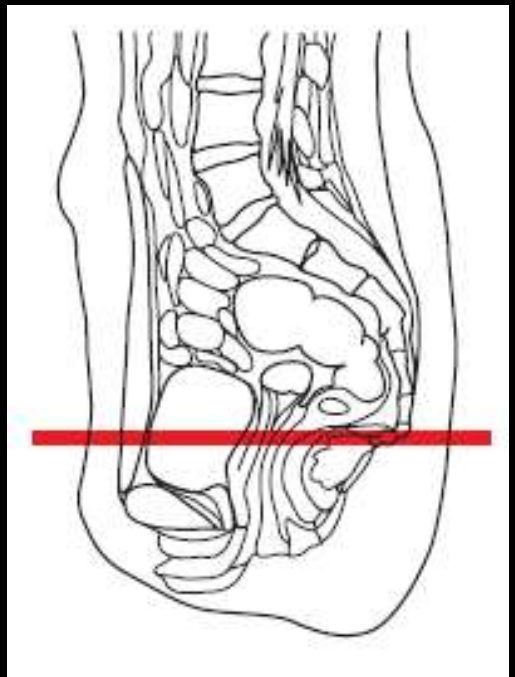
MRI ….***Multi Sequences*** ….***Multi Planner***

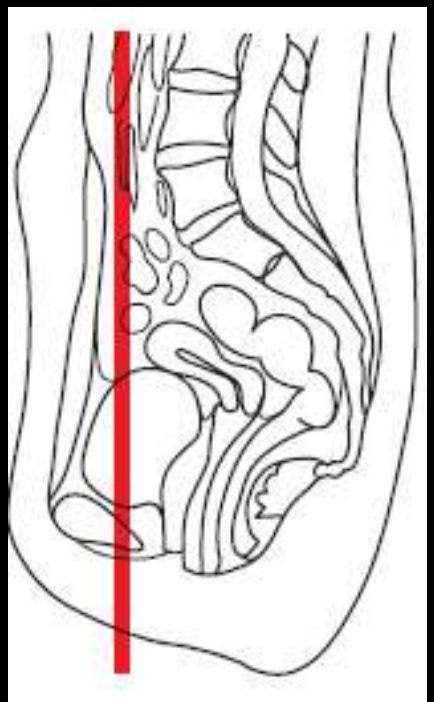
- ***<u>Multi sequences</u>***……

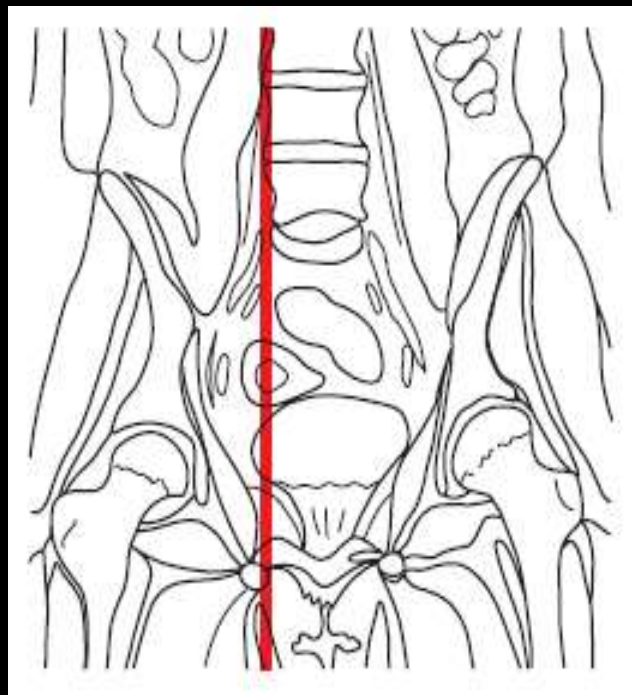
T1 , T2 , FLIR , …..etc.

<u>Multi Planner</u>

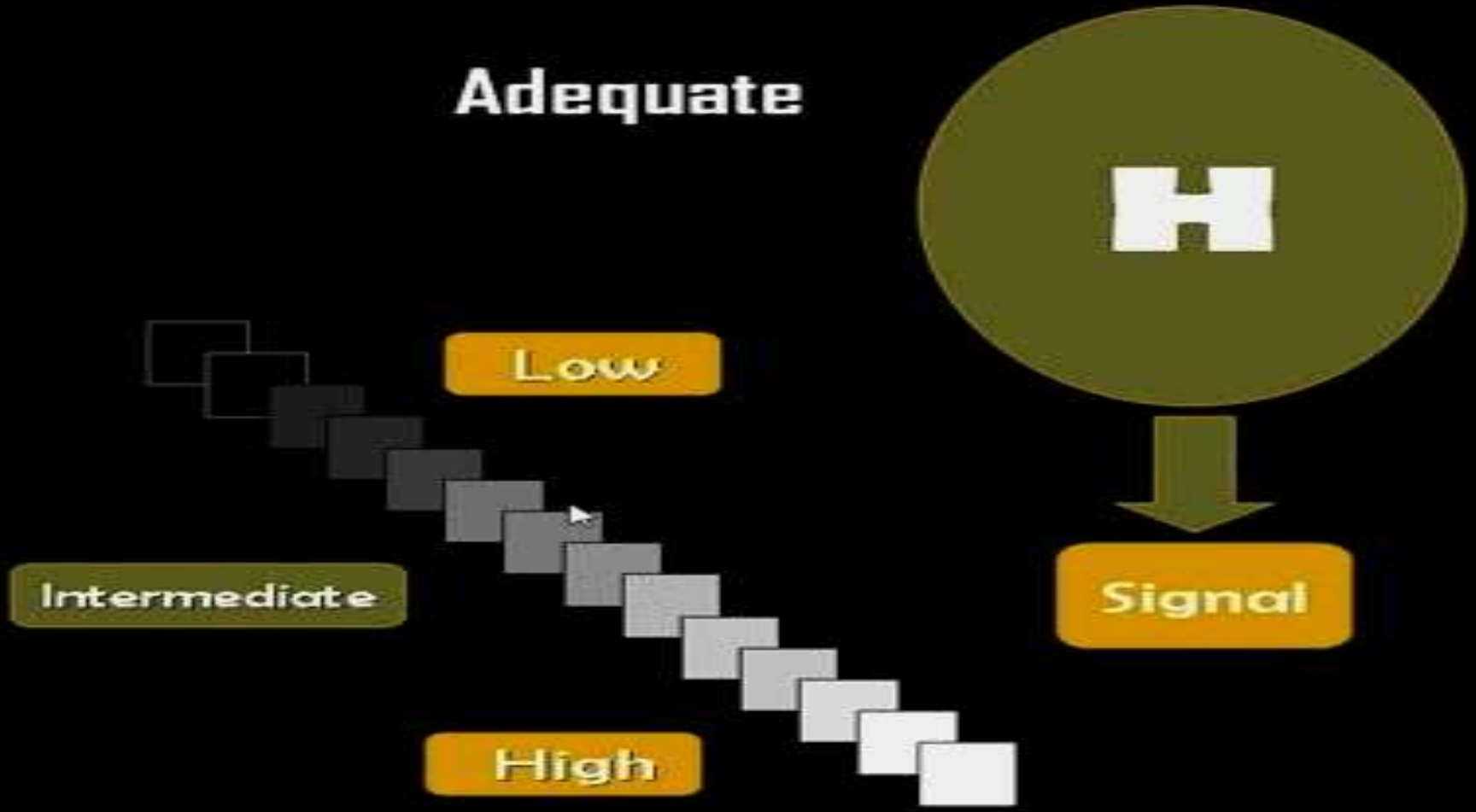
…… Axial , Coronal, sagital.





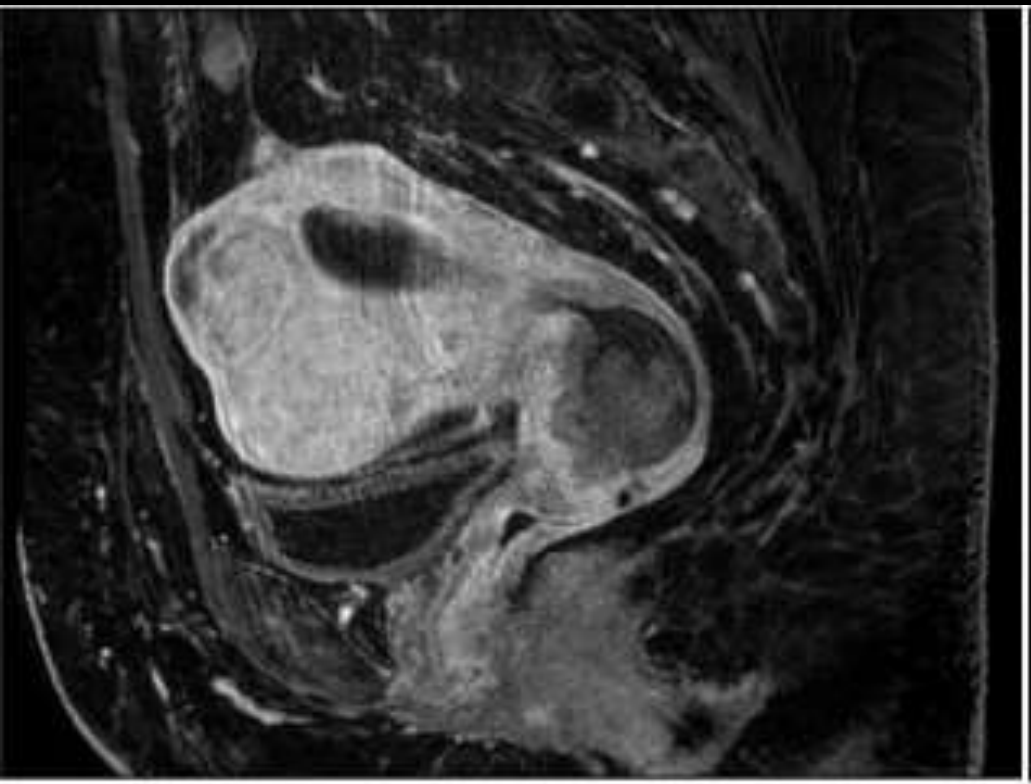


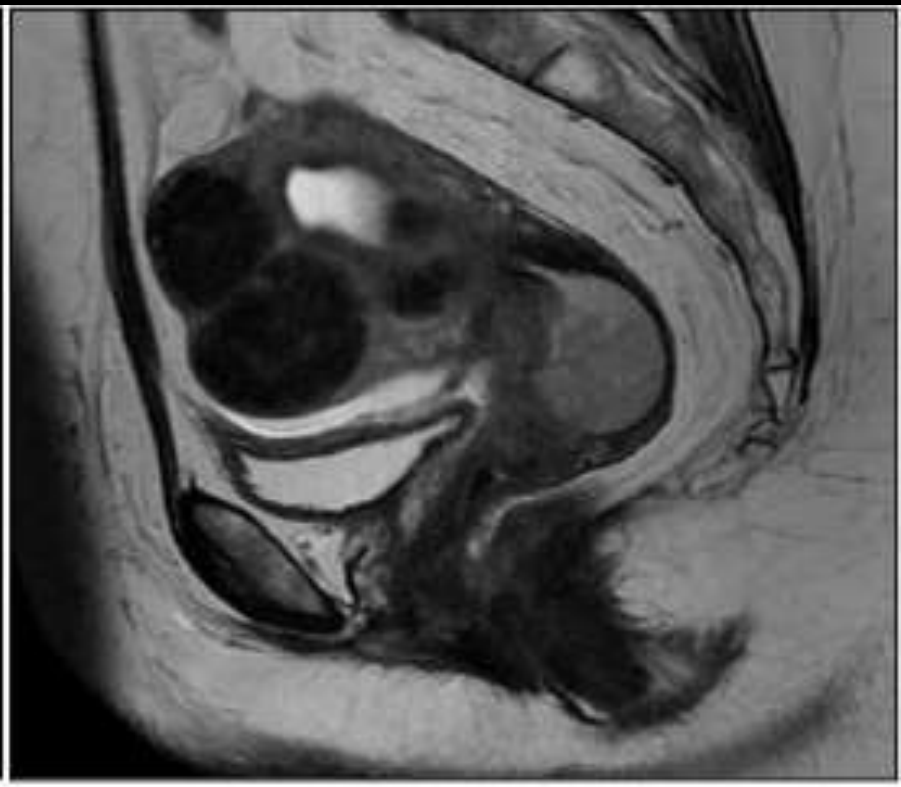
The ***Key word*** is...Signal ***Intensity***



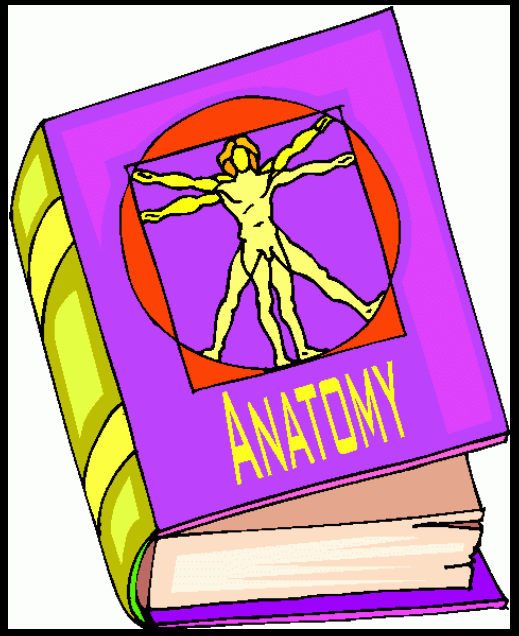
MR SIGNAL CHARACTERISTICS

T1	T2	Diagnosis	Example
Low	High	Fluid	Urine in the bladder
Low	Low	Calcium fibrous tissue	Lieomyoma
High	High	Blood	Hemorrhagic cyst endometriosis,..
High	Low	Fat	Normal pelvic fat Dermoid cyst

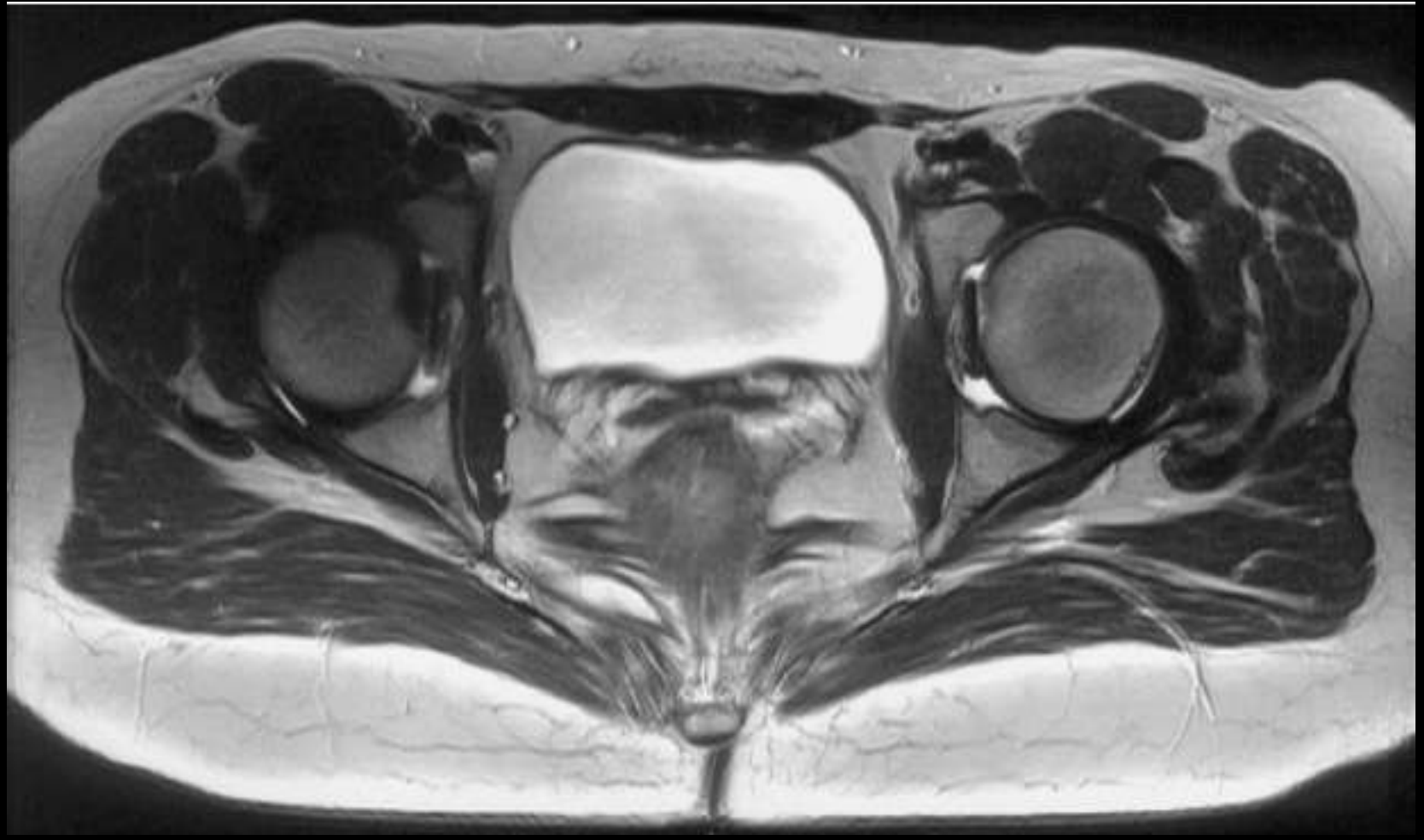


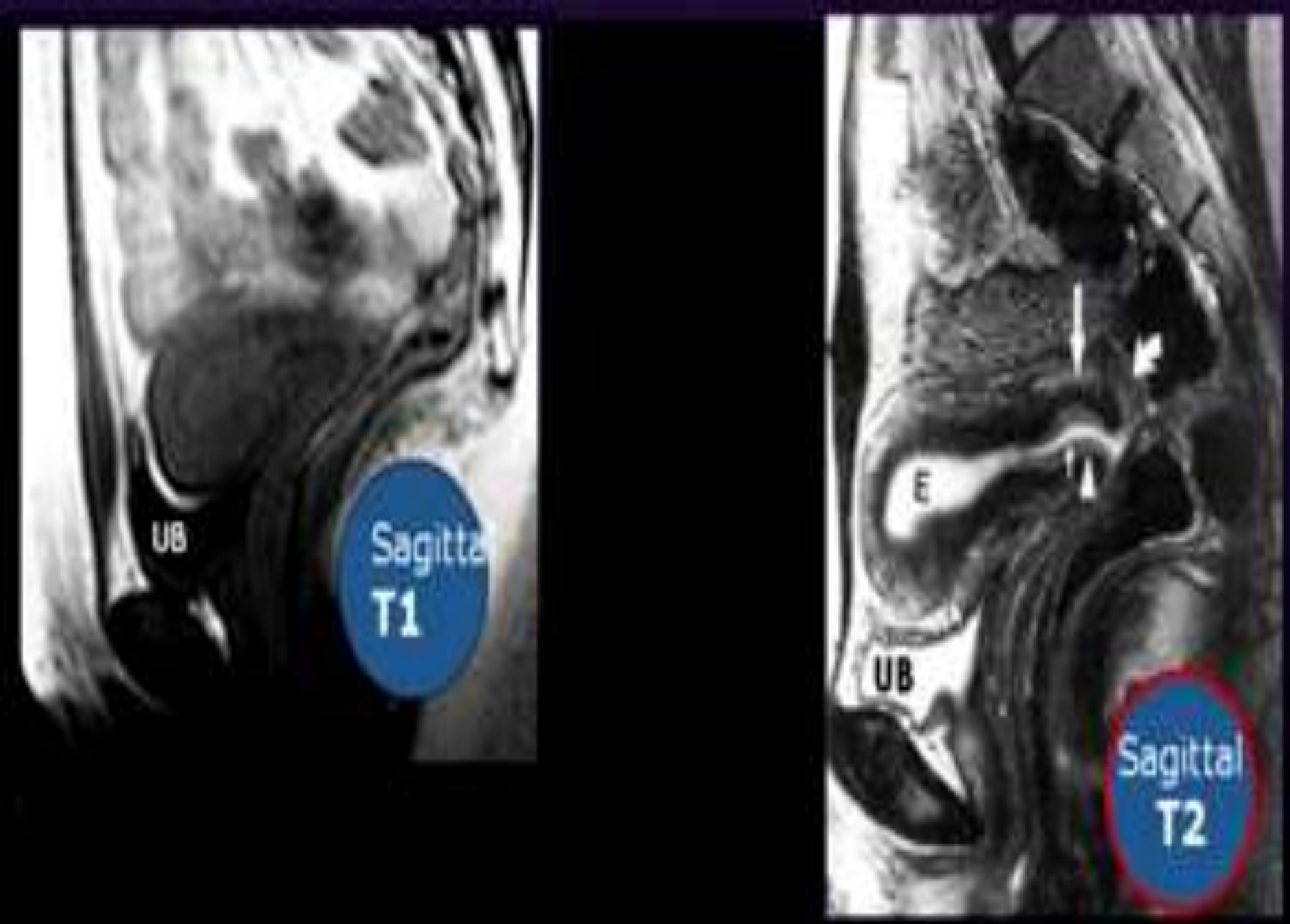


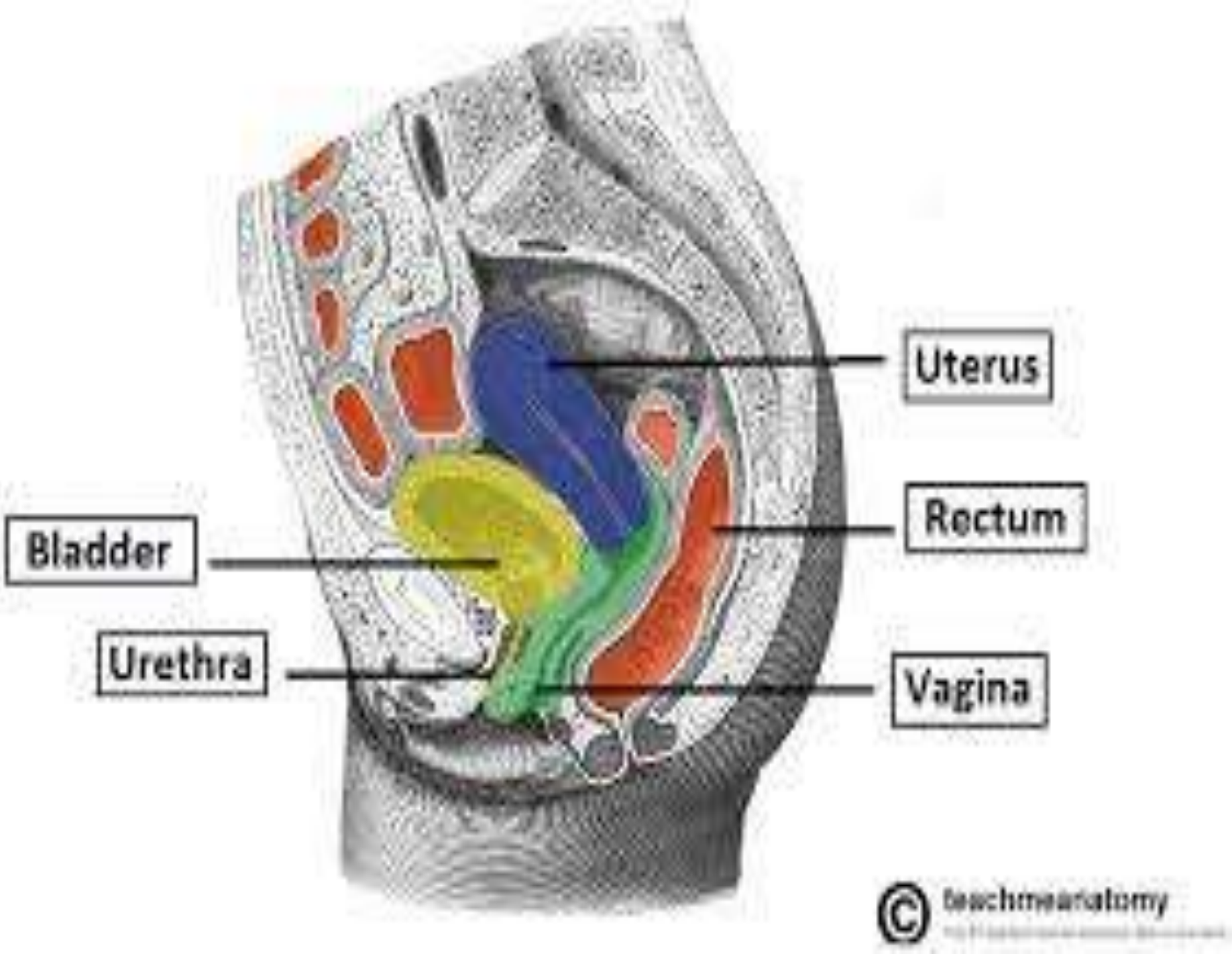
ANATOMY

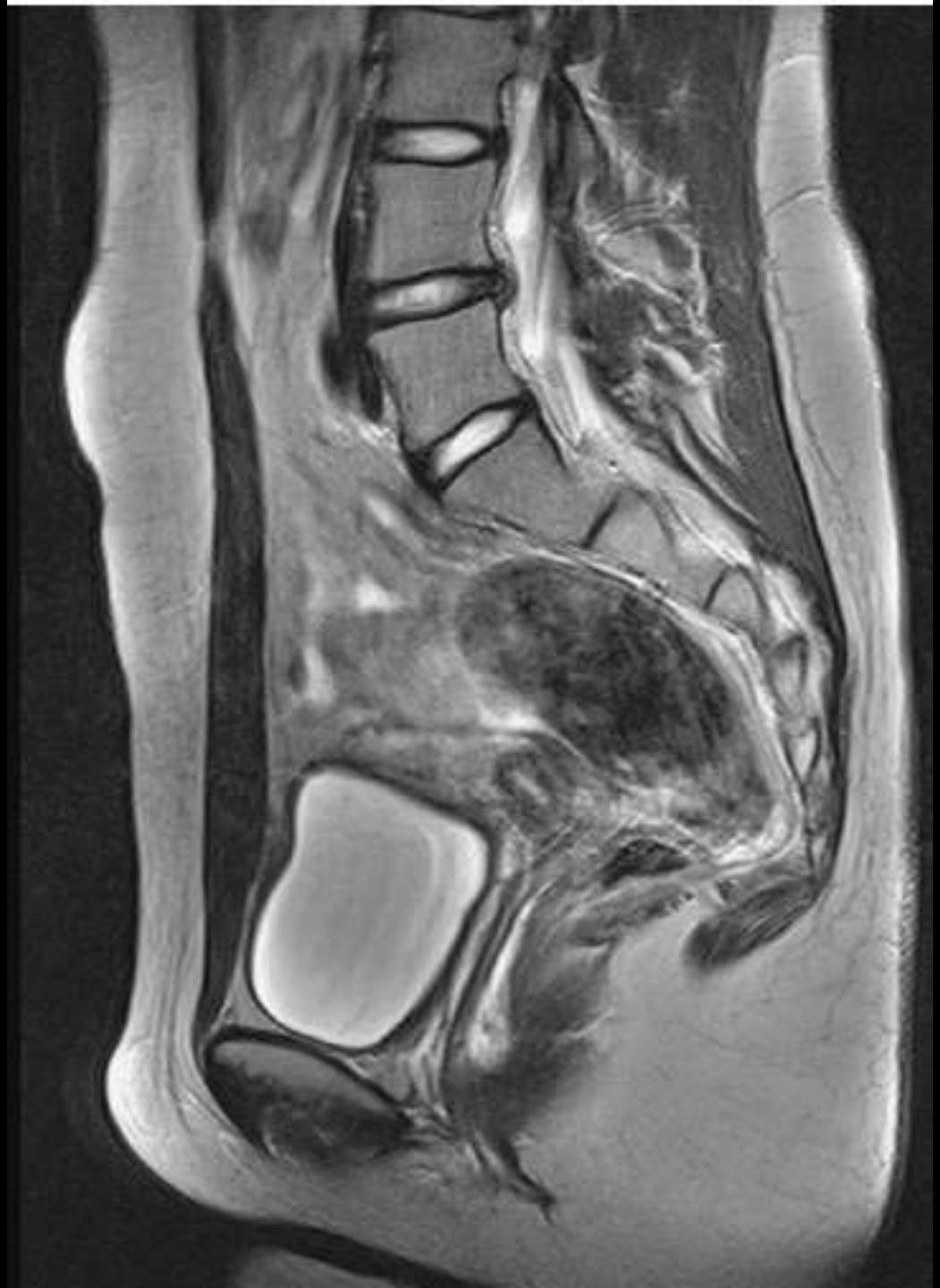


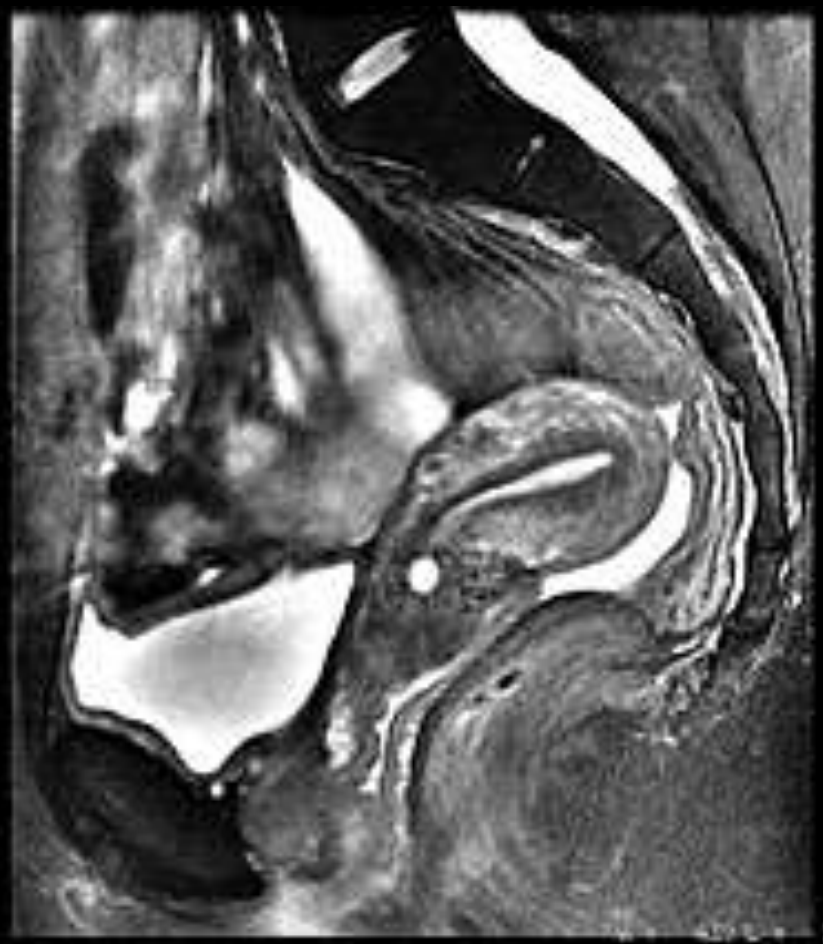
Axial

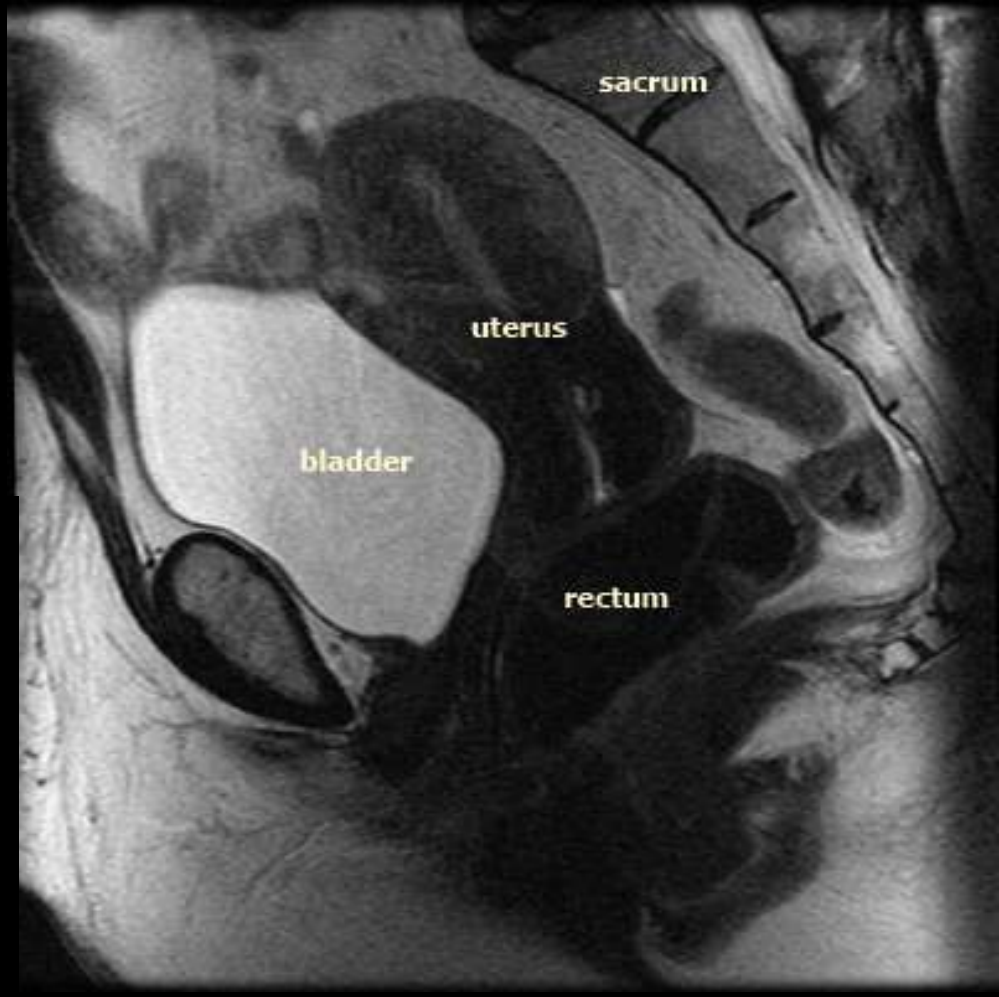


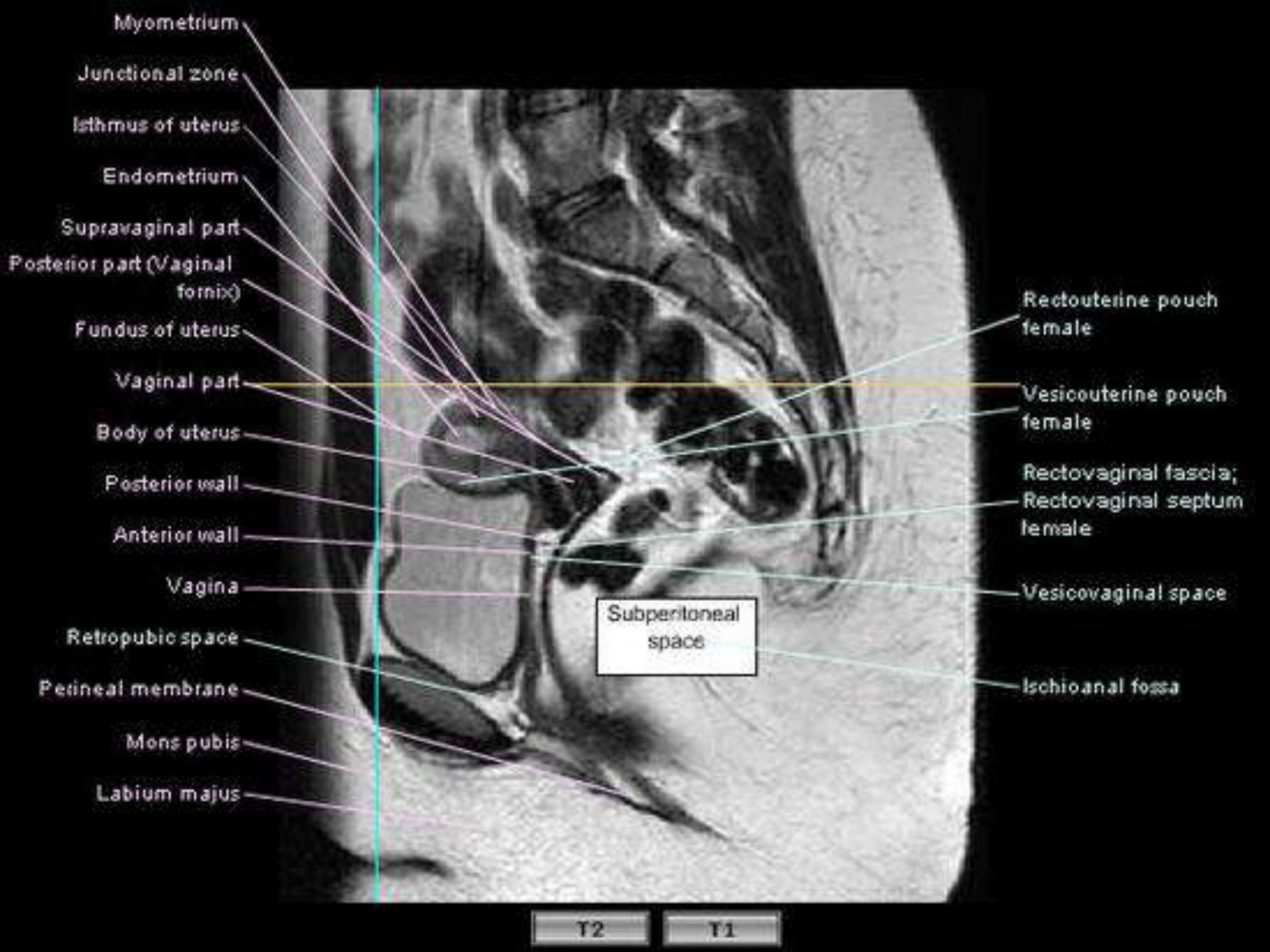

UB
Sagitta
T1
E
UB
Sagittal
T2

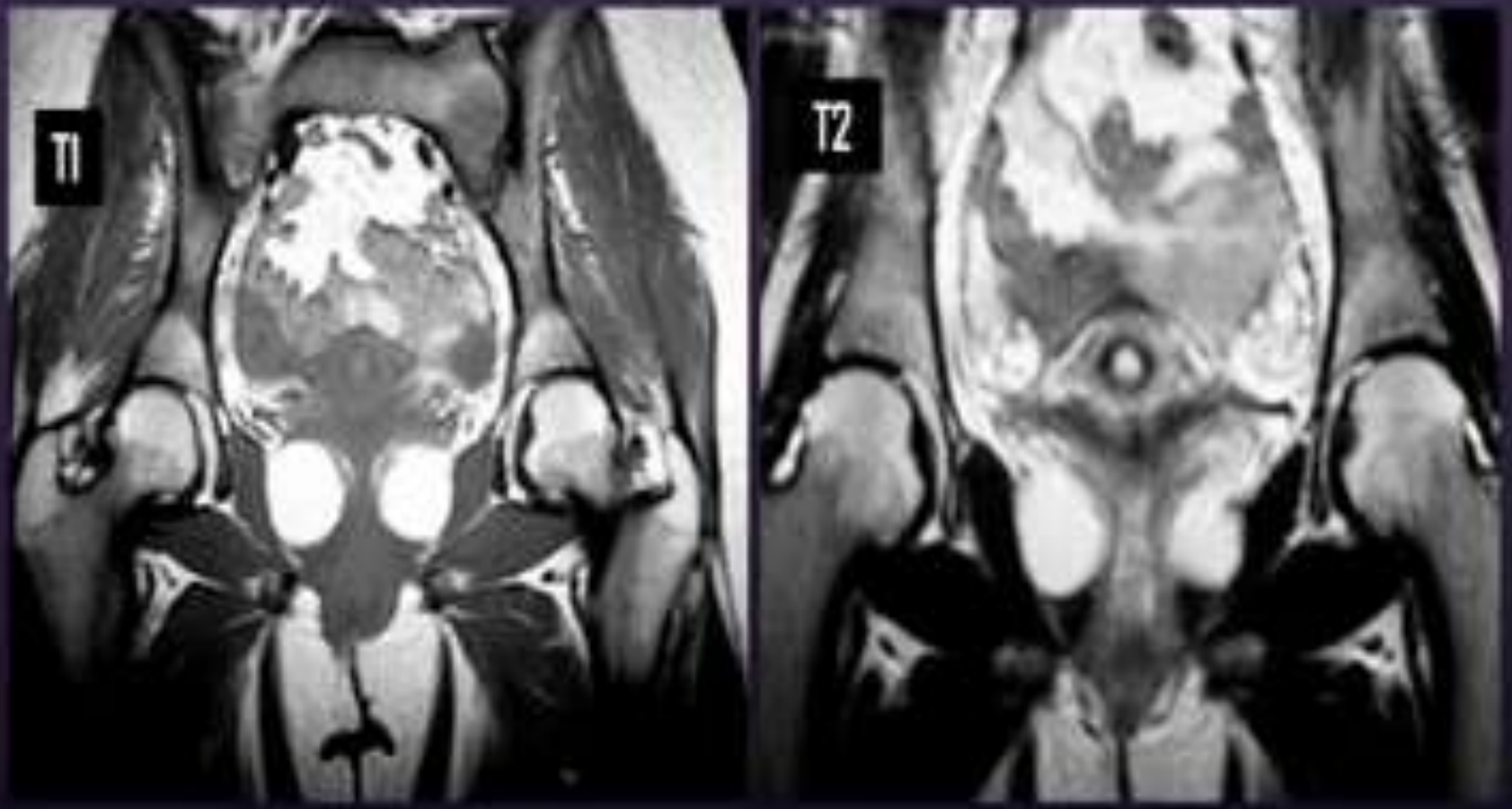

Uterus
Rectum
Bladder
Urethra
Vagina
© teachmeanatomy

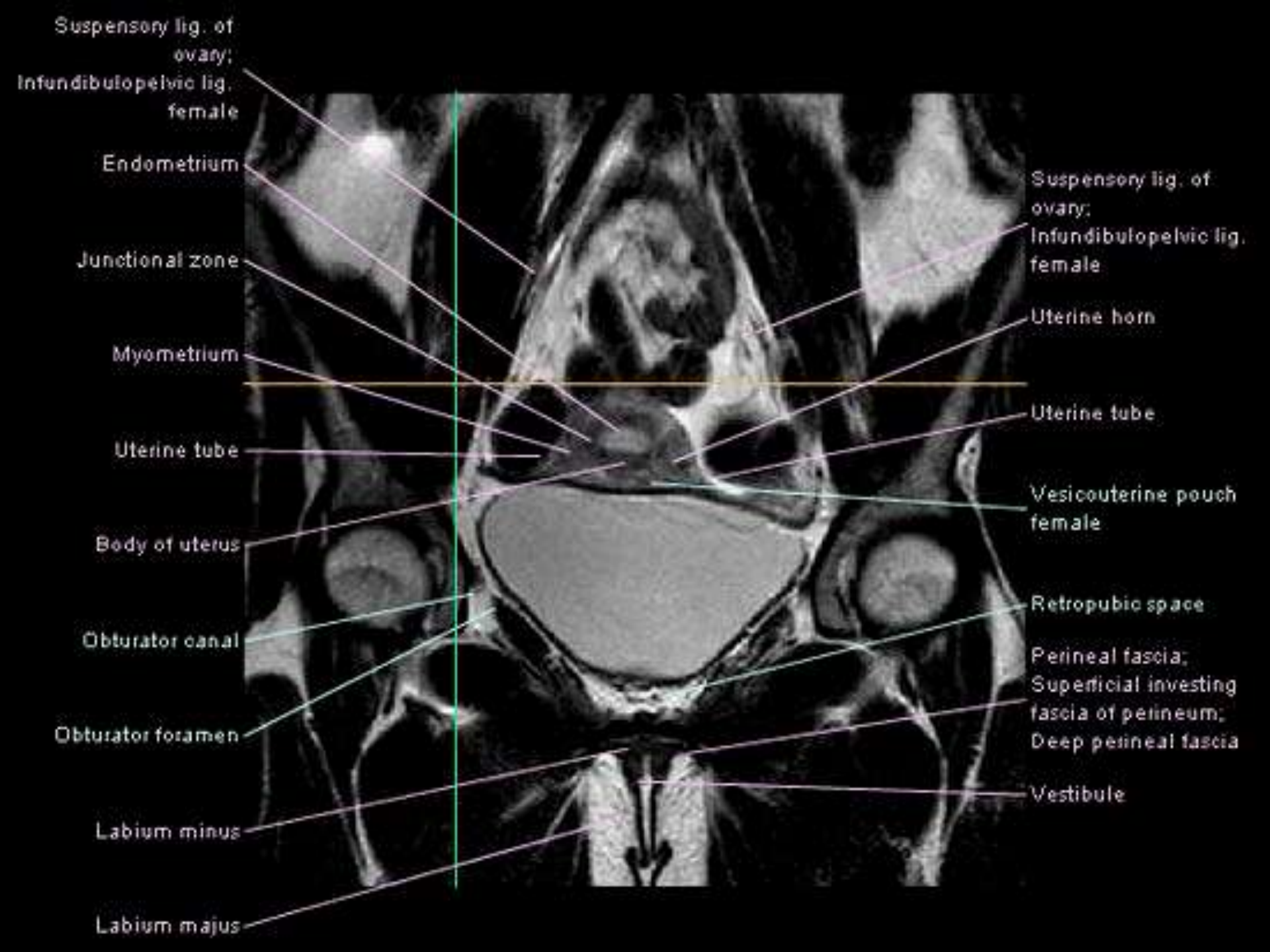





sacrum
uterus
bladder
rectum

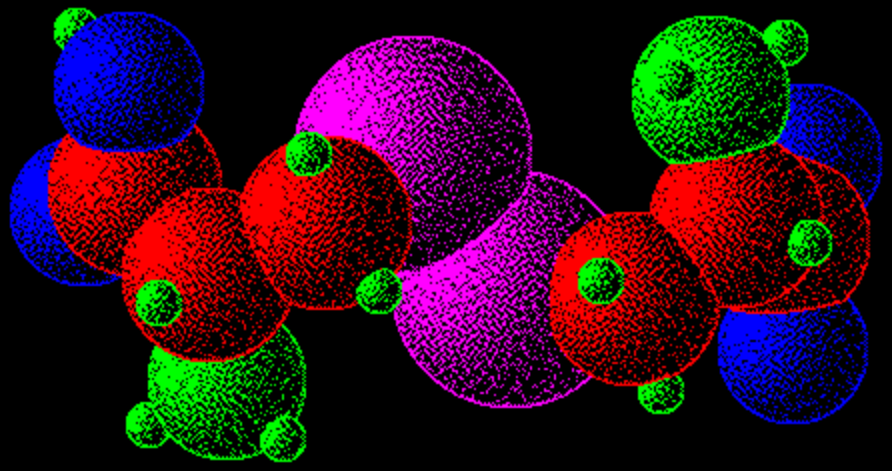

Myometrium
Junctional zone
Isthmus of uterus
Endometrium
Supravaginal part
Posterior part (Vaginal fornix)
Fundus of uterus
Vaginal part
Body of uterus
Posterior wall
Anterior wall
Vagina
Retropubic space
Perineal membrane
Mons pubis
Labium majus
Rectouterine pouch female
Vesicouterine pouch female
Rectovaginal fascia; Rectovaginal septum female
Vesicovaginal space
Subperitoneal space
Ischioanal fossa
T2
T1

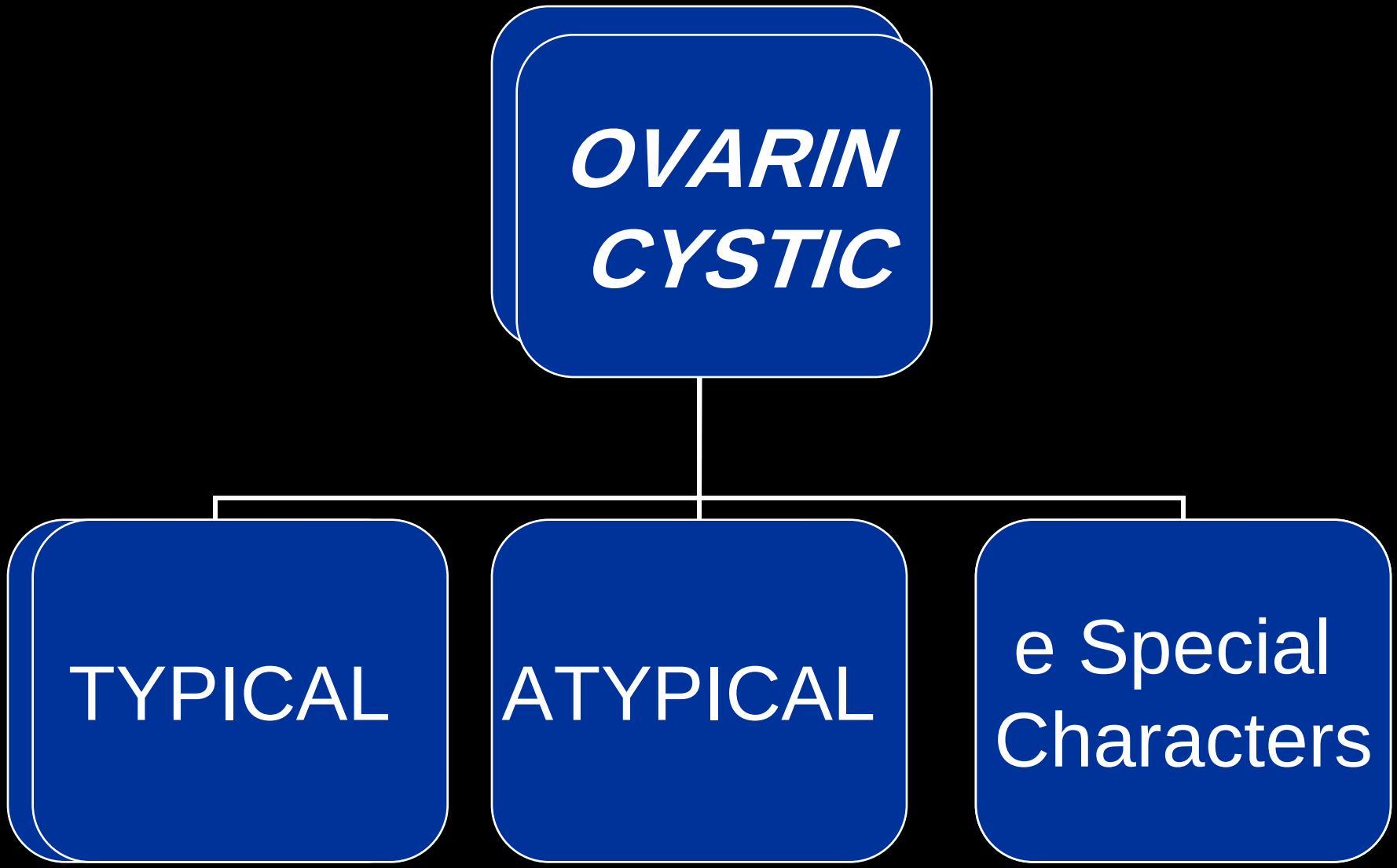

T1
T2


Suspensory lig. of ovary; Infundibulopelvic lig. female
Endometrium
Junctional zone
Myometrium
Uterine tube
Body of uterus
Obturator canal
Obturator foramen
Labium minus
Labium majus
Suspensory lig. of ovary; Infundibulopelvic lig. female
Uterine horn
Uterine tube
Vesicouterine pouch female
Retropubic space
Perineal fascia; Superficial investing fascia of perineum; Deep perineal fascia
Vestibule

OVARIAN LESIONS

I- Cystic
OVARIAN LESIONS




OVARIN CYSTIC
TYPICAL
ATYPICAL
e Special Characters

* ***TYPICAL***

- Paper Thin wall
- Clear Water Contents
- No Calc.
- No Nodules
- No Septations
- No enhancement

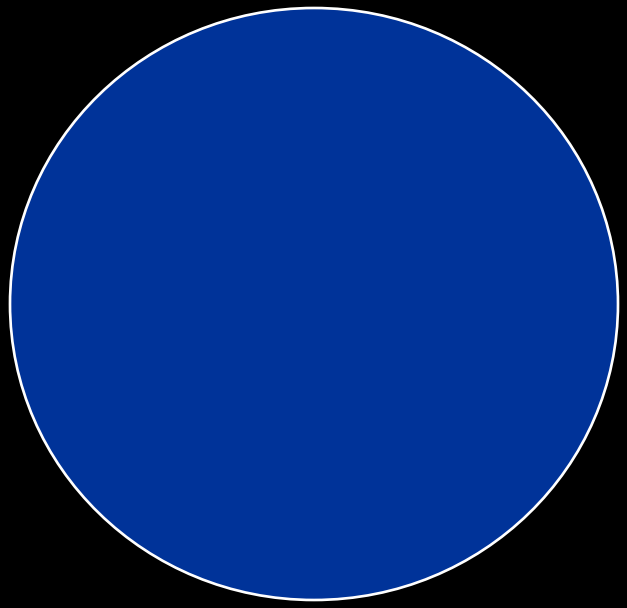
= ***BENIGN CYST***

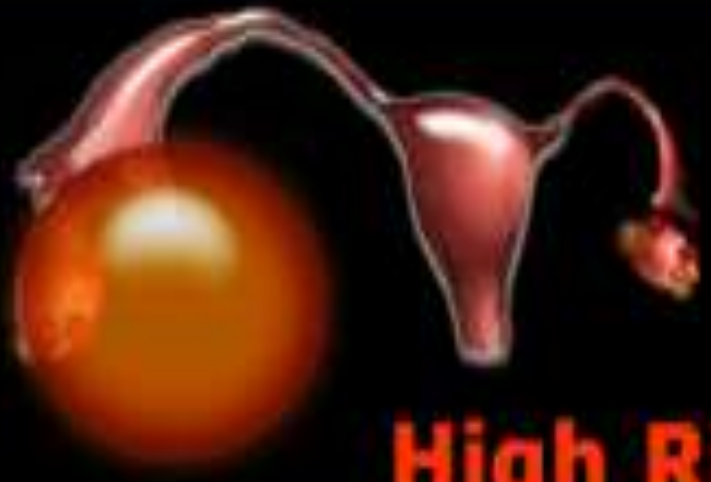
* ***Atypical***

- Thick wall
- Septation
- Calcification
- ***Gas Bubbles***

= ***INFLAMATORY***

* ***Cysts e special characters***





Low Risk

Premenopausal
and
No riskfactors

High Risk

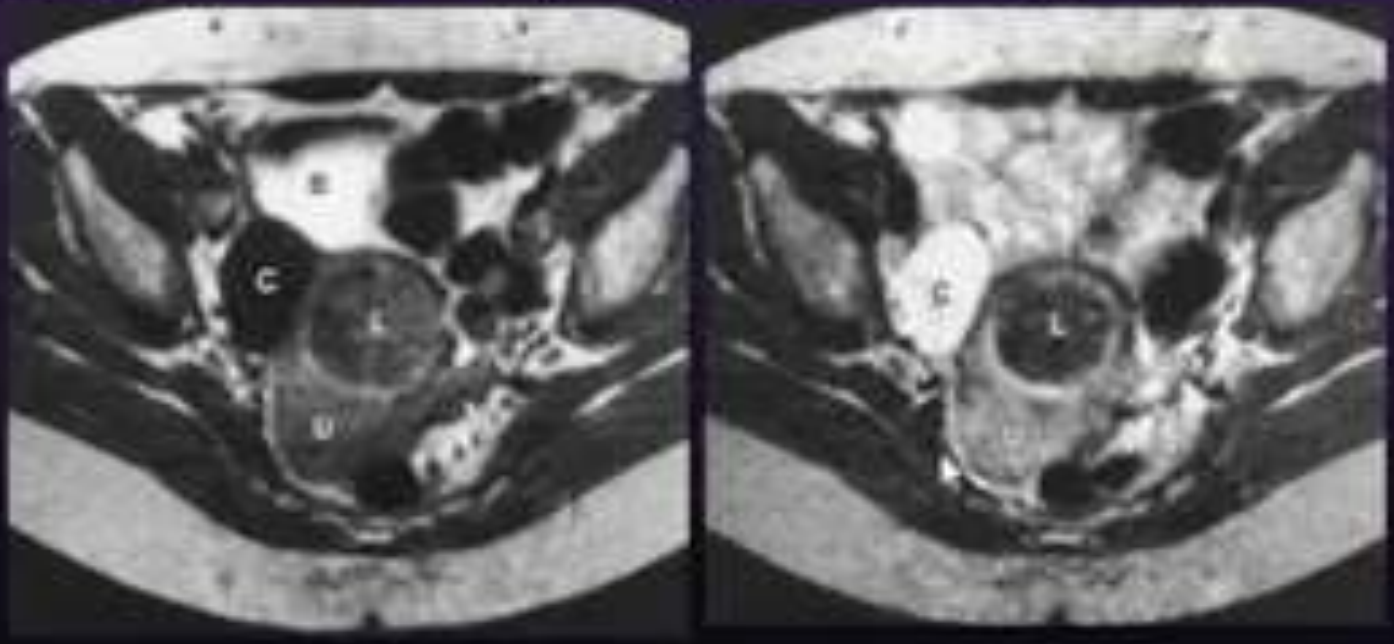
Postmenopausal
or
Other riskfactors

- Personal of familial history of breast or ovarian ca

Ovaries

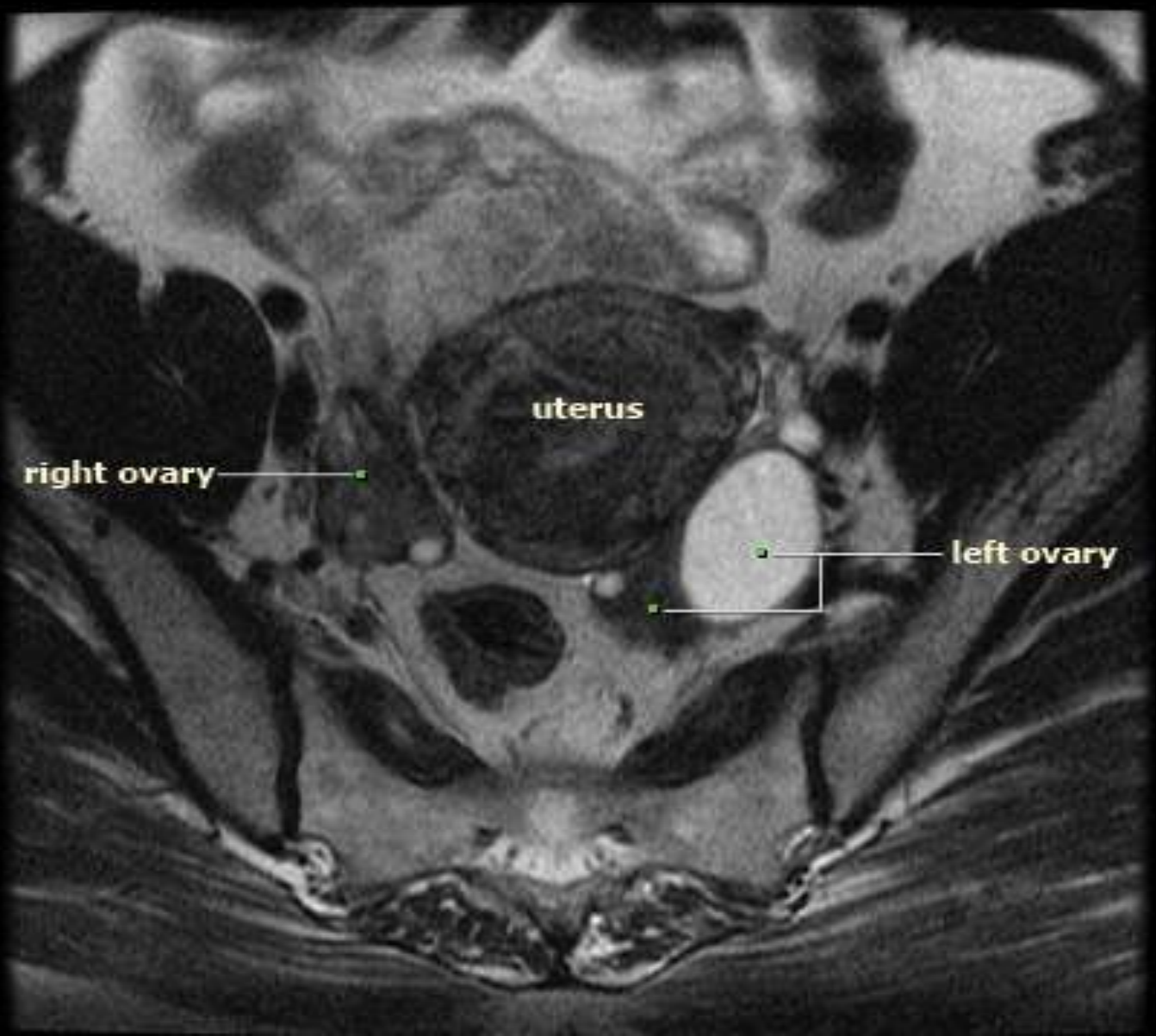
Simple cyst

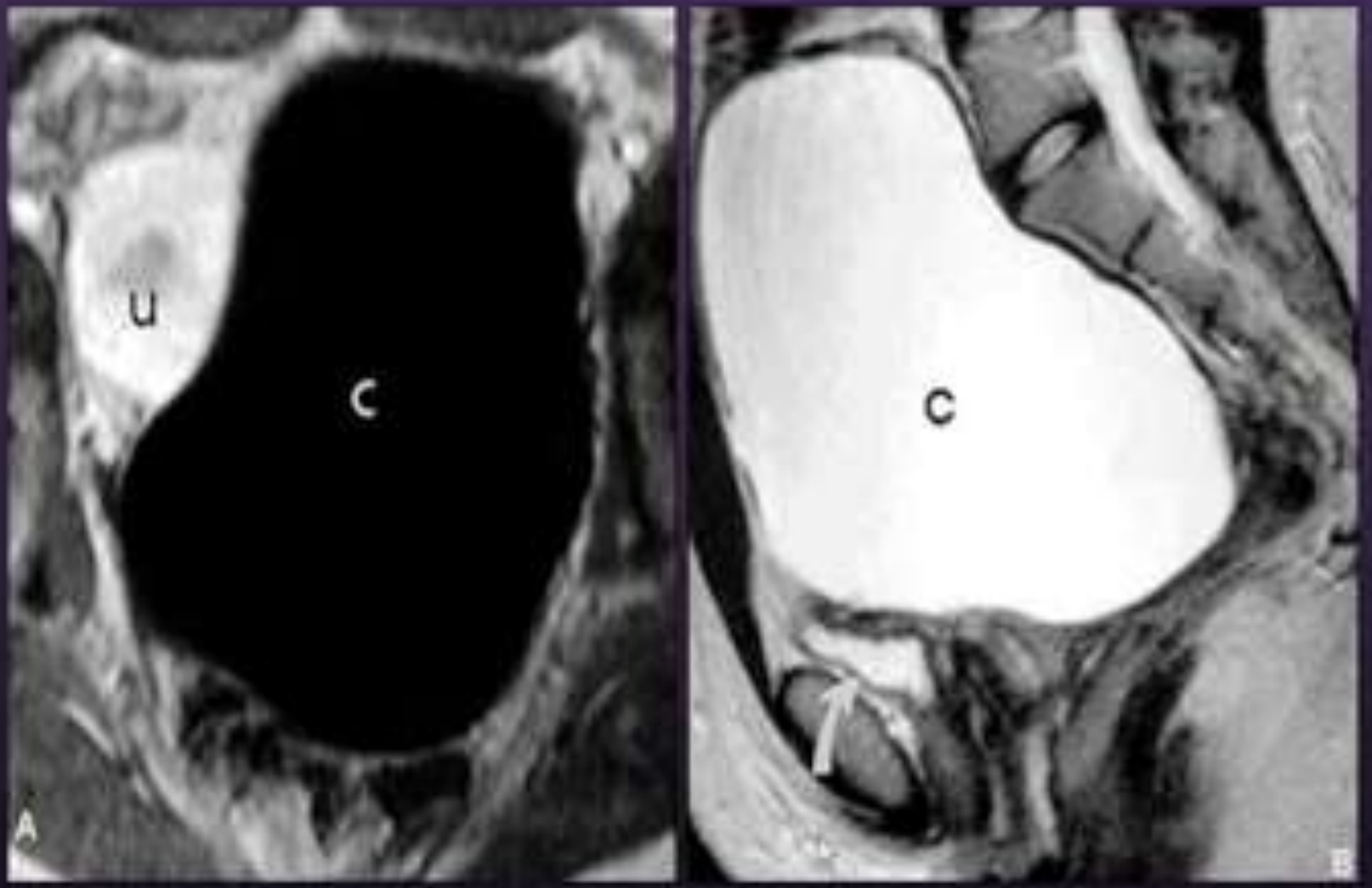
- Usually solitary and small < 4cm
- Large, multiple, bilateral
- MRI low signal in T1, high signal in T2 WIs
- High signal in T1 WIs may suggest hemorrhage or fat



Simple ovarian cyst

Benign Ovarian Cyst





Ovarian cyst

Simple cyst
diagnostic approach

Low Risk

Done. No FU
Do not mention

Done. No FU
Mention in report:
almost certainly benign

Yearly FU with US
until resolved
Mention in report:
almost certainly benign

Further evaluation
with MRI or
surgery

High Risk

Done. No FU
Do not mention

Yearly FU with US
until resolved
Mention in report:
almost certainly benign

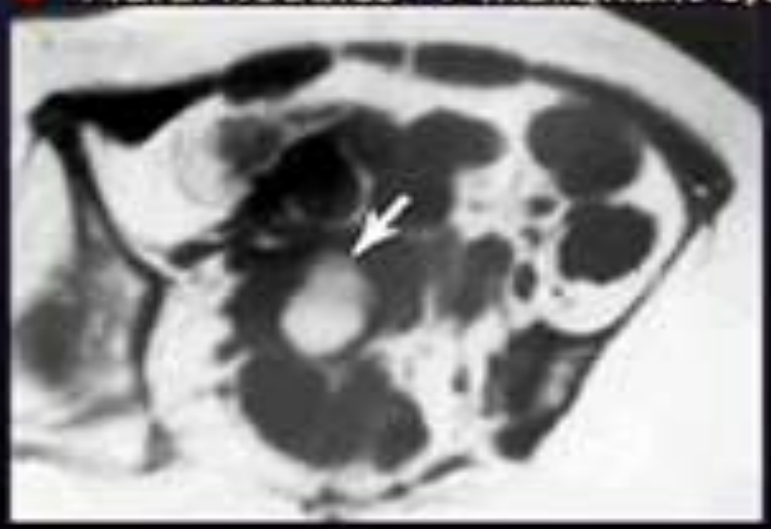
Further evaluation
with MRI or
surgery

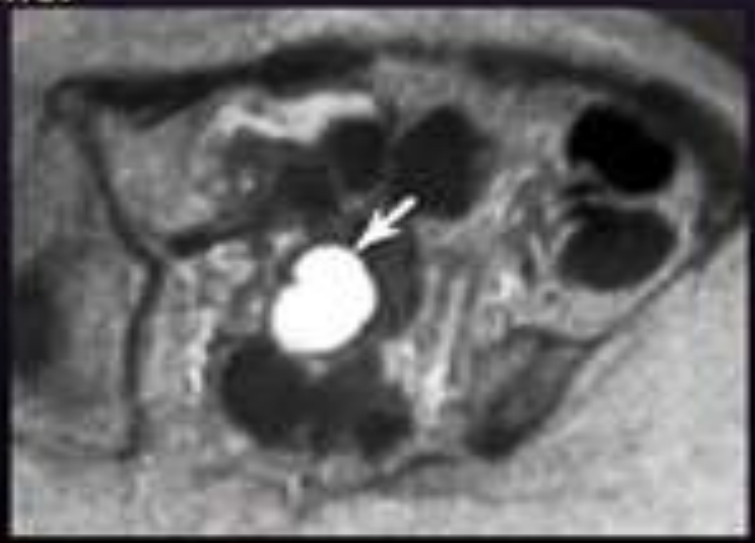
http://www.radiologyassistant.nl/en/p4d85aa9a92bbb

Ovaries

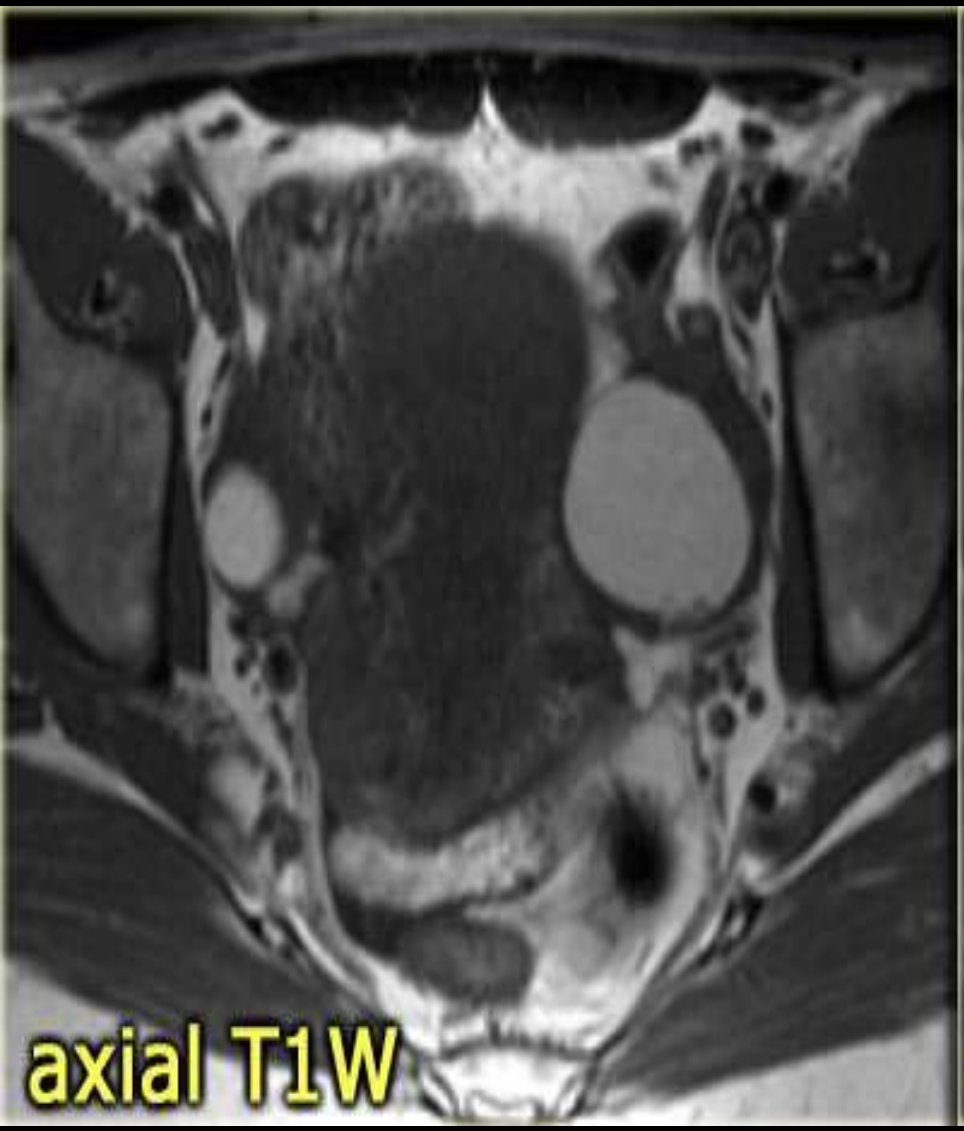
Atypical simple cyst

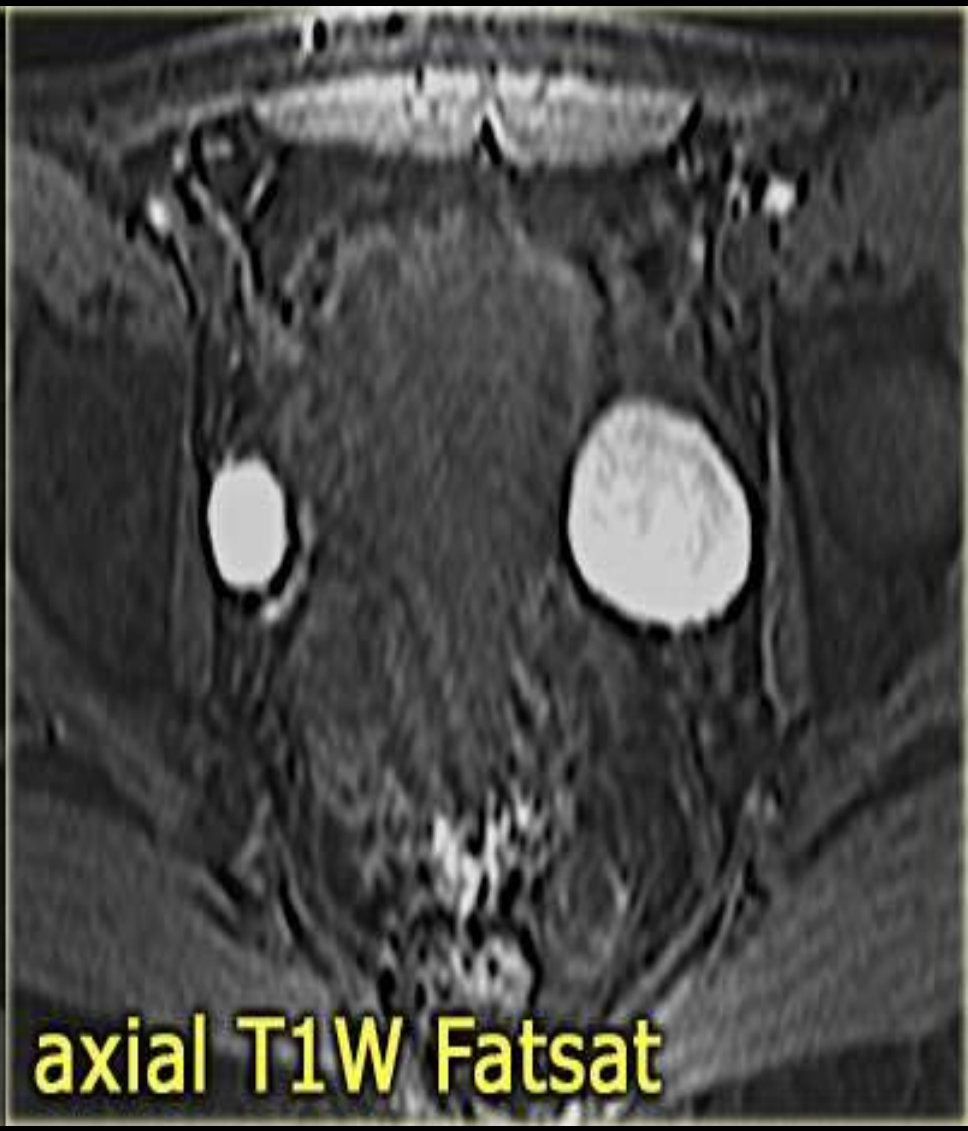
- Septations → benign atypical cyst
- Thick enhancing wall → abscess
- Calcification → infected cyst, parasitic, benign cystadenoma
- Abnormal contents
  - Fat → dermoid cyst
  - Blood → hemorrhagic cyst or endometriosis
- Mural nodules → malignant cystic tumor

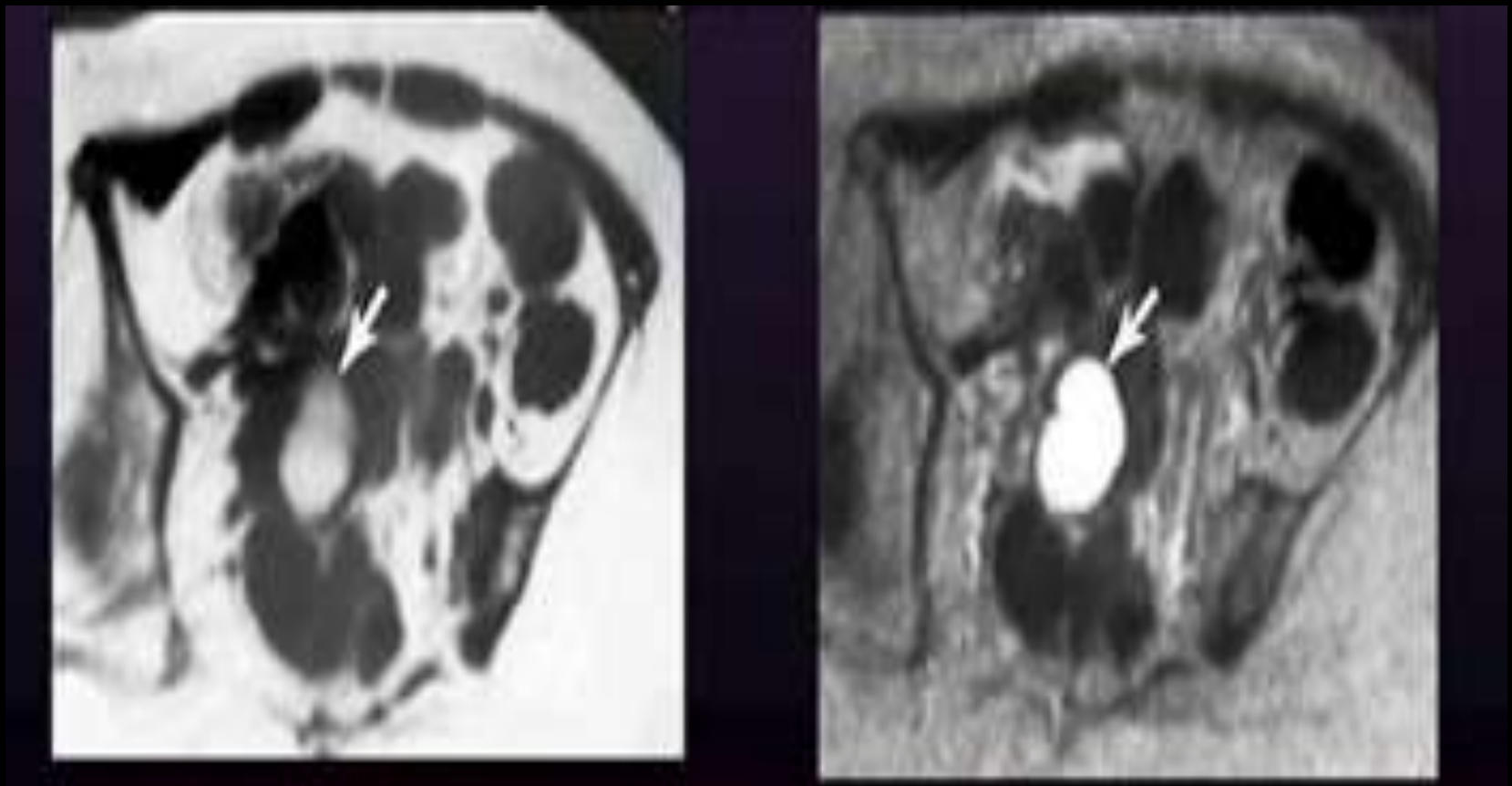




Hemorrhagic ovarian cyst


axial T1W


axial T1W Fatsat



Hemorrhagic ovarian cyst

Hemorrhagic cyst

diagnostic approach

Low Risk

< 3

Done. No FU
Not mentioning in report is o.k.

3-5

Done. No FU
Mention in report: almost certainly benign

> 5

6-12 week FU with US
resolved ⇨ done
unchanged ⇨ MRI

High Risk

< 5

In early menopause:
6-12 week FU with US
resolved ⇨ done
unchanged ⇨ MRI

> 5

In early menopause:
Further evaluation
with MRI or surgery

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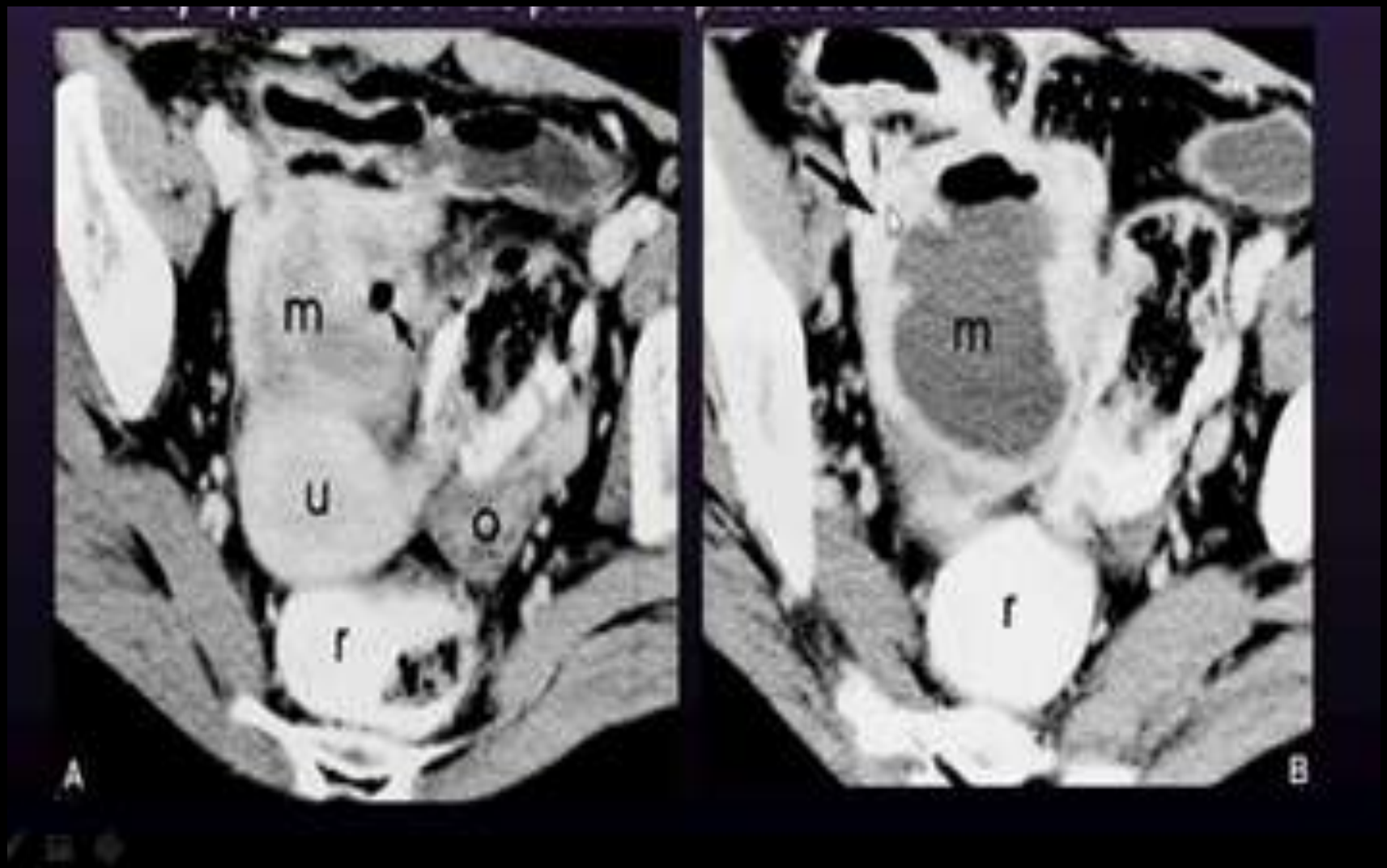
any cyst

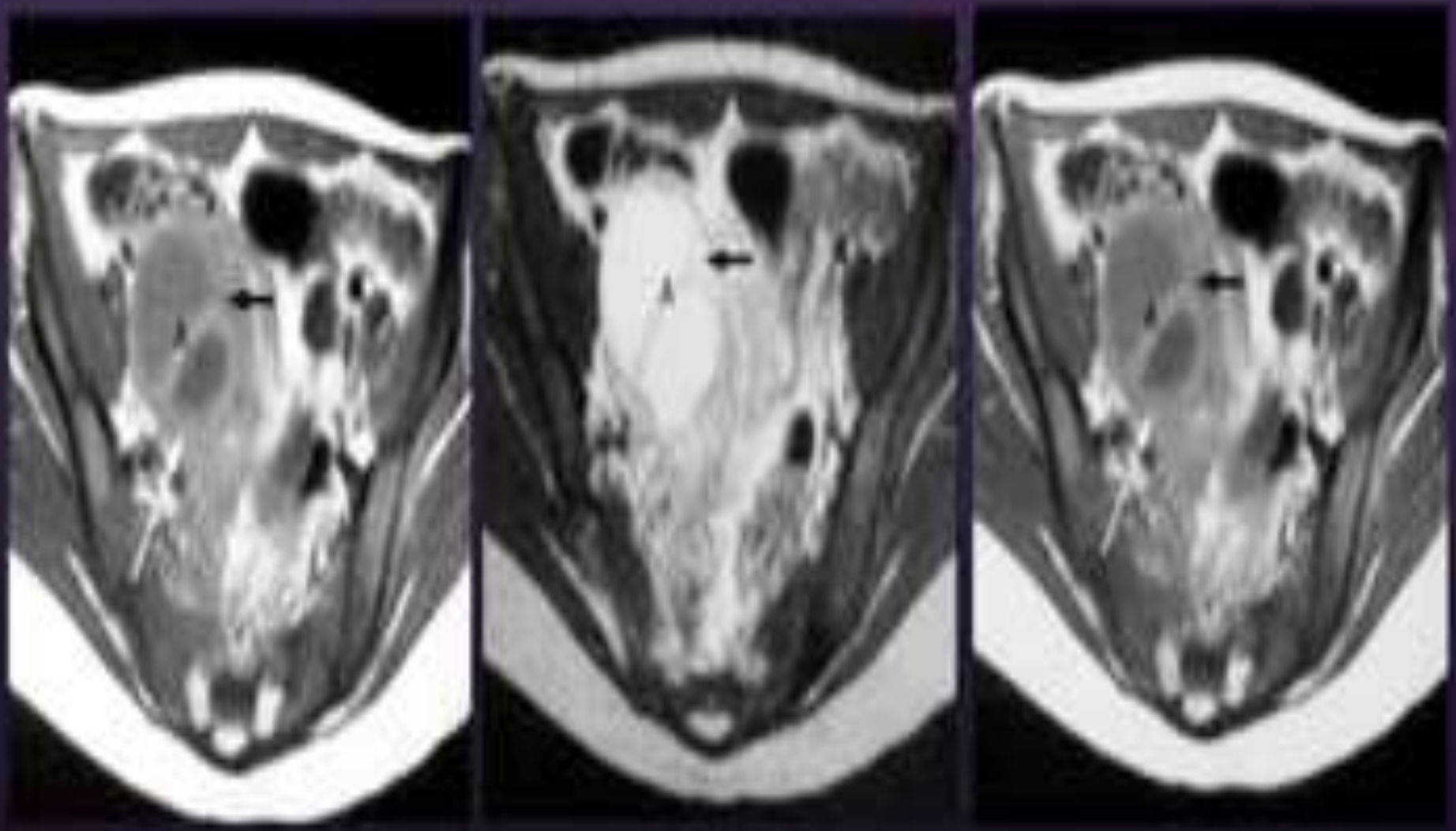
In late menopause:
Further evaluation
with MRI or surgery

➔ Tubo-ovarian Abscess

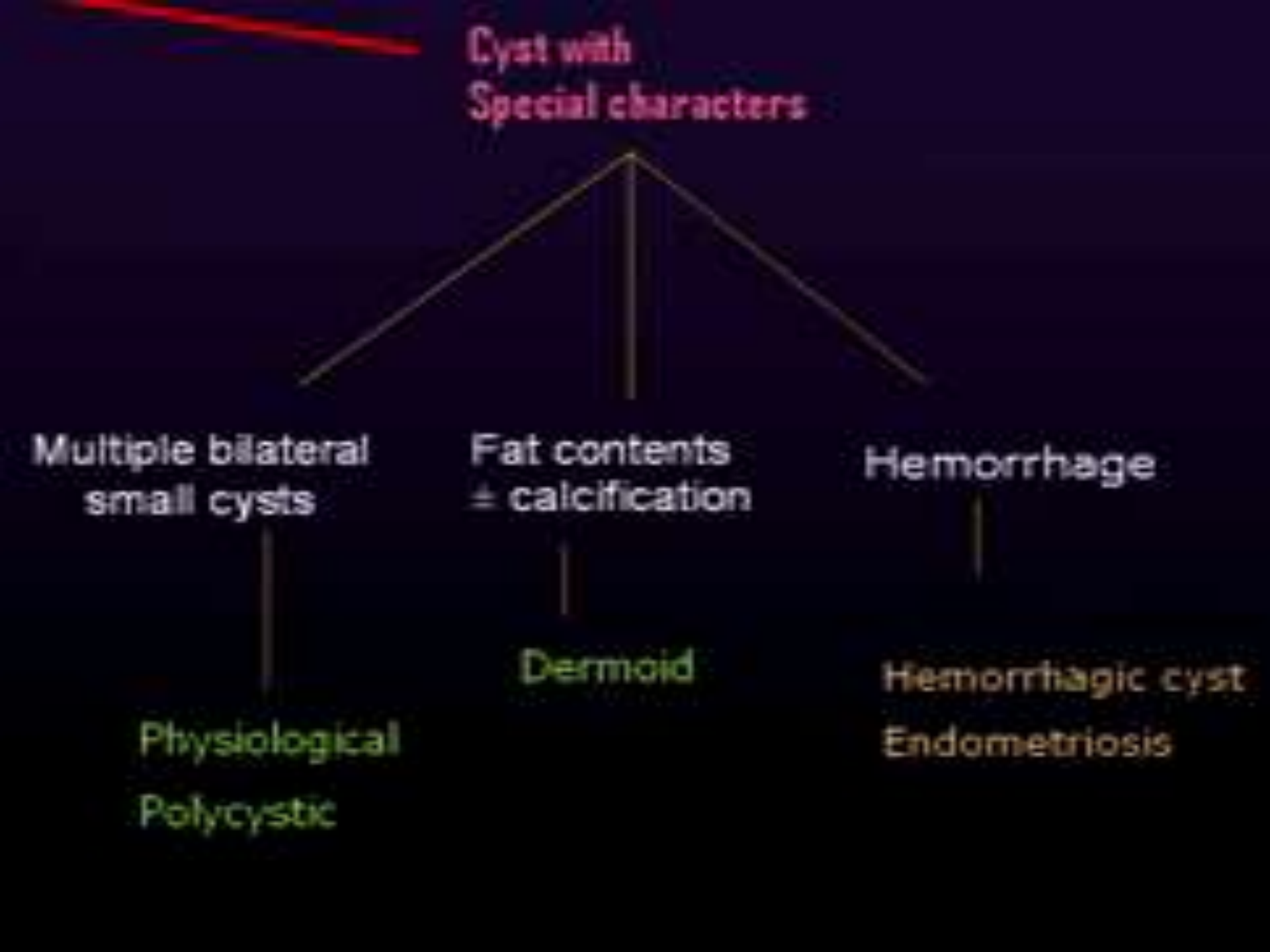
- Cystic
- Single or Multi locular
- ***Thick ENHANCING*** wall
- Air Bubbles is ***Diagnostic***

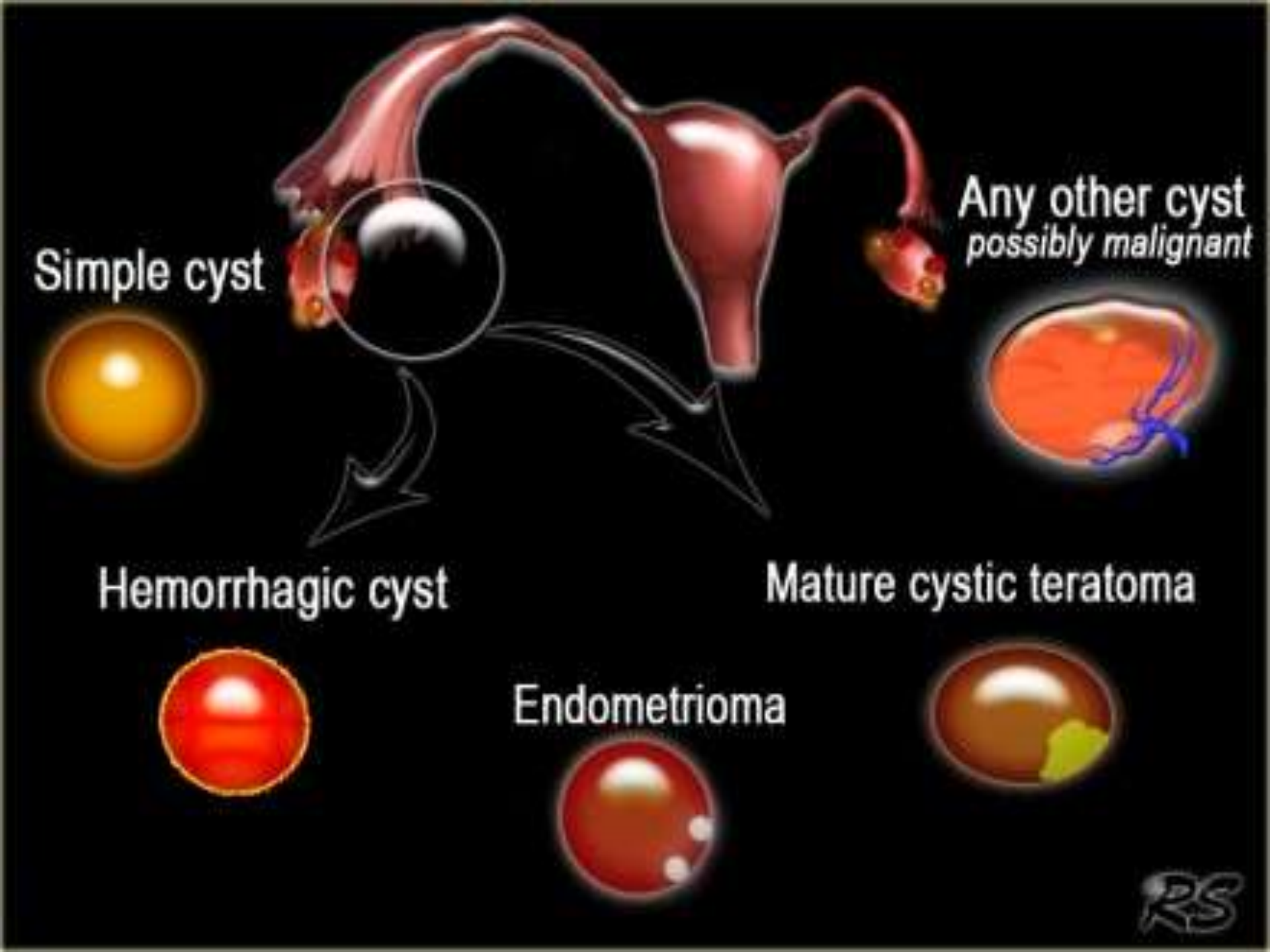
- CT is better in detection of ***Ca***lcification , ***Air*** Bubbles.





TUBO OVARIAN ABSCESS


Cyst with
Special characters
Multiple bilateral
small cysts
Fat contents
± calcification
Hemorrhage
Physiological
Polycystic
Dermoid
Hemorrhagic cyst
Endometriosis


Simple cyst
Any other cyst
possibly malignant
Hemorrhagic cyst
Mature cystic teratoma
Endometrioma

Any other cyst *possibly malignant*

Low Risk and High Risk:
Surgical resection by oncologic gynaecologist who may request prior imaging-based staging

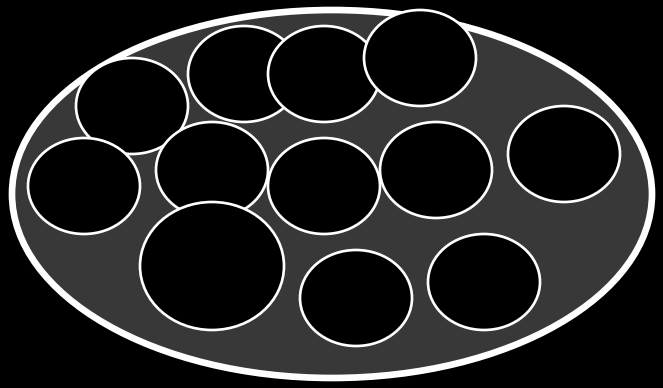
Polycystic Ovary

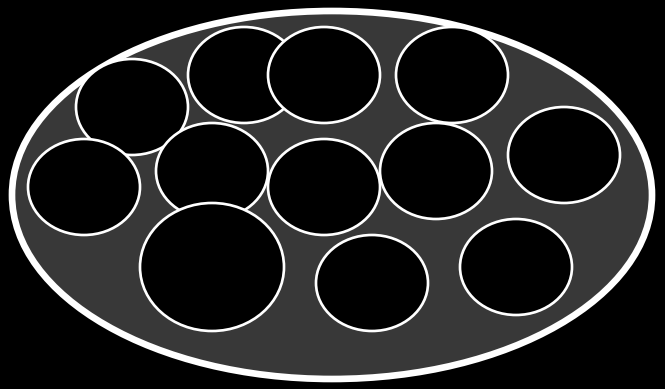
- Always ***BILATERAL***
- ***Infertility , Amenorrhea , Hirsutism***
- ***Imaging:***

  bilateral

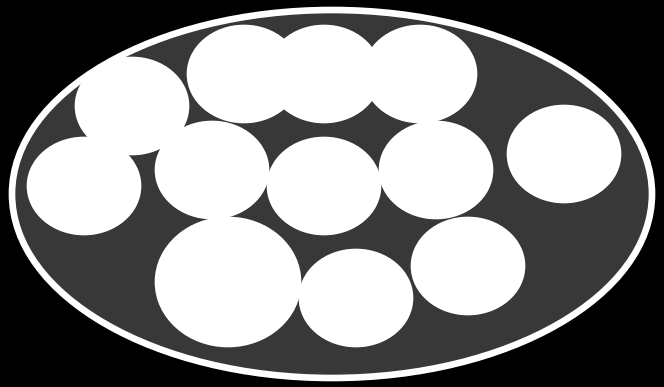
  - ***Enlarged ovaries "3:5 cm"***
  - ***Multiple cysts Low T1, High T2***
  - ***Stroma inbetween is Low in T1& T2.***

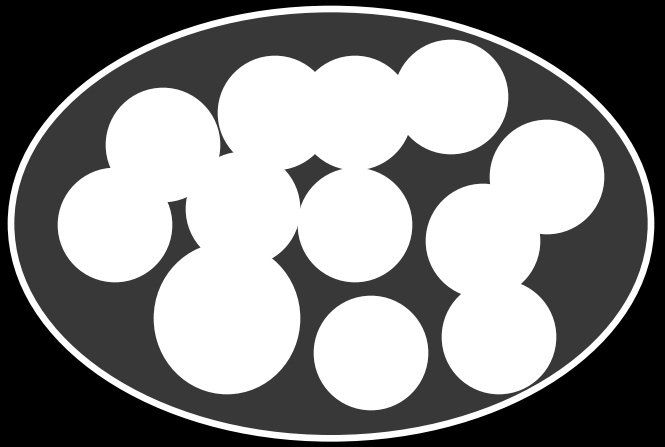
T1

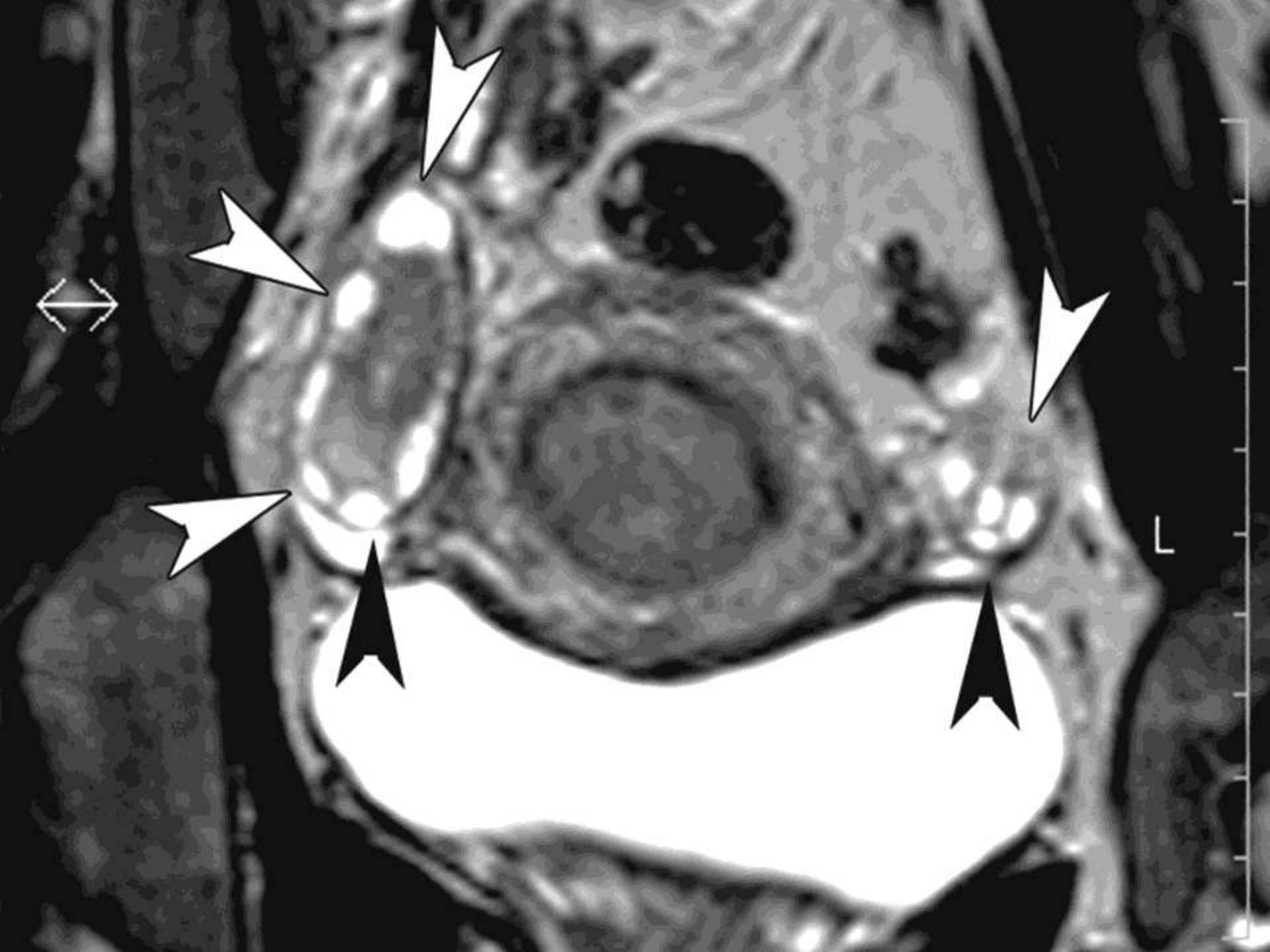


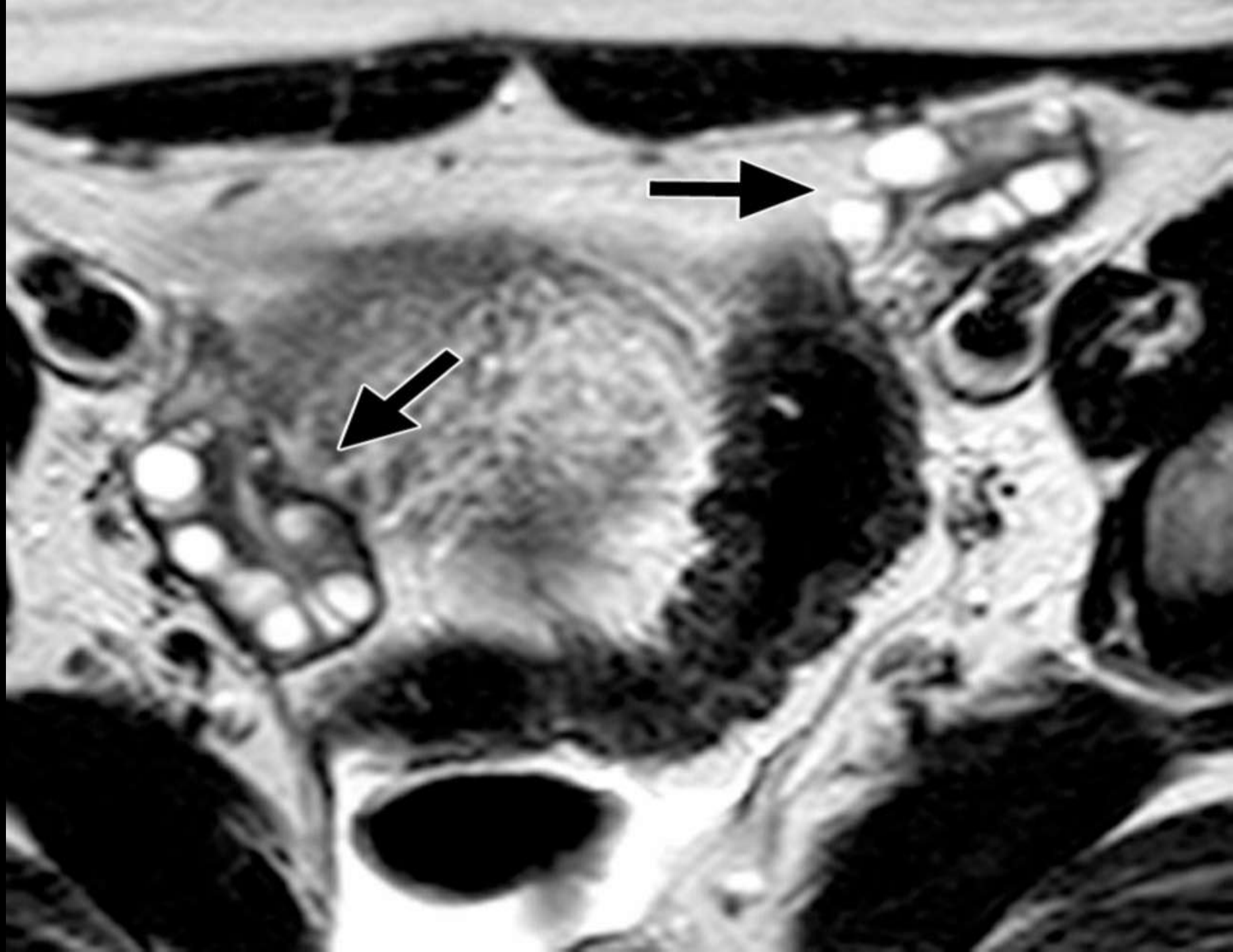


T2






L

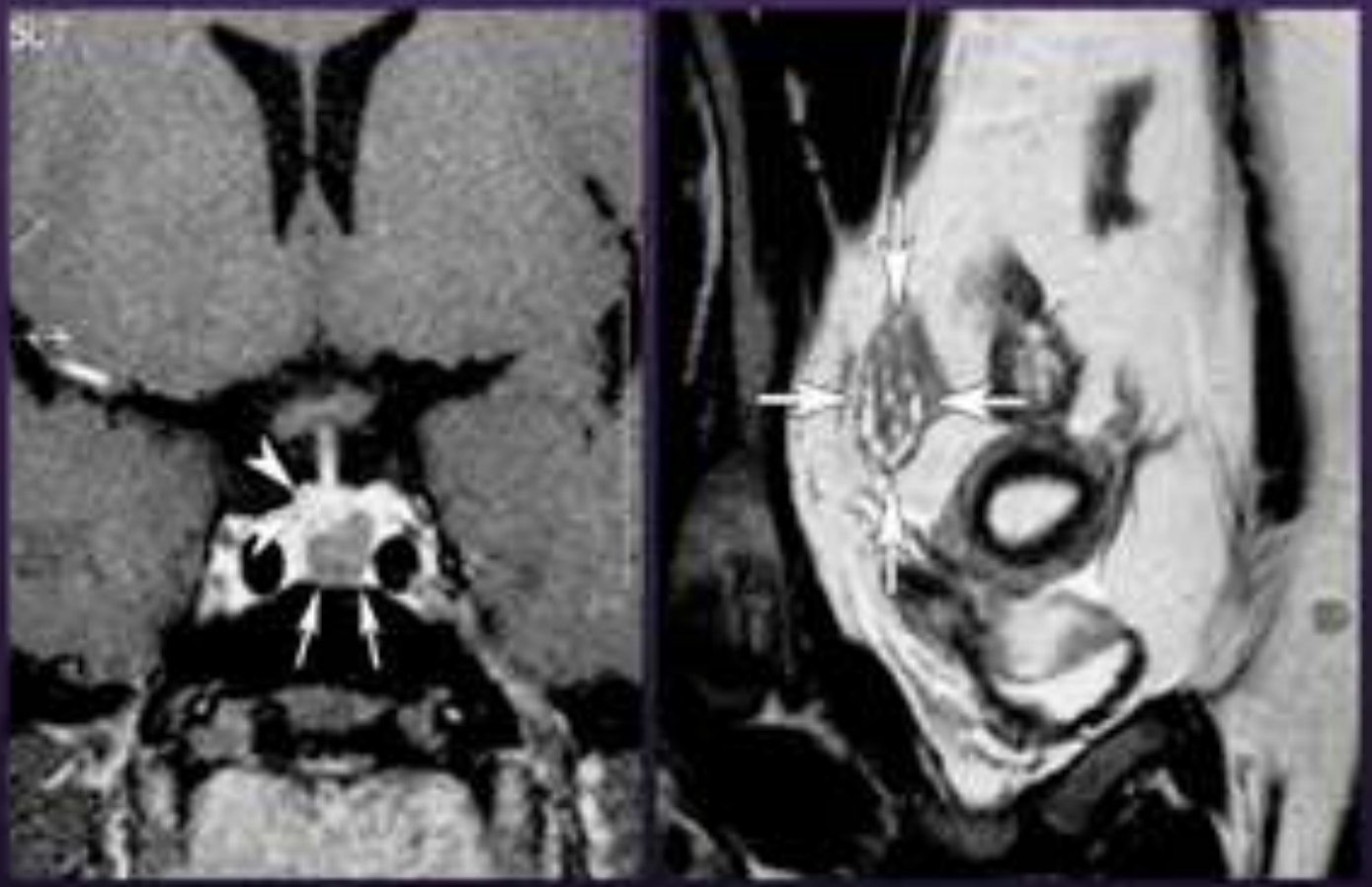


- ***D.D. :***

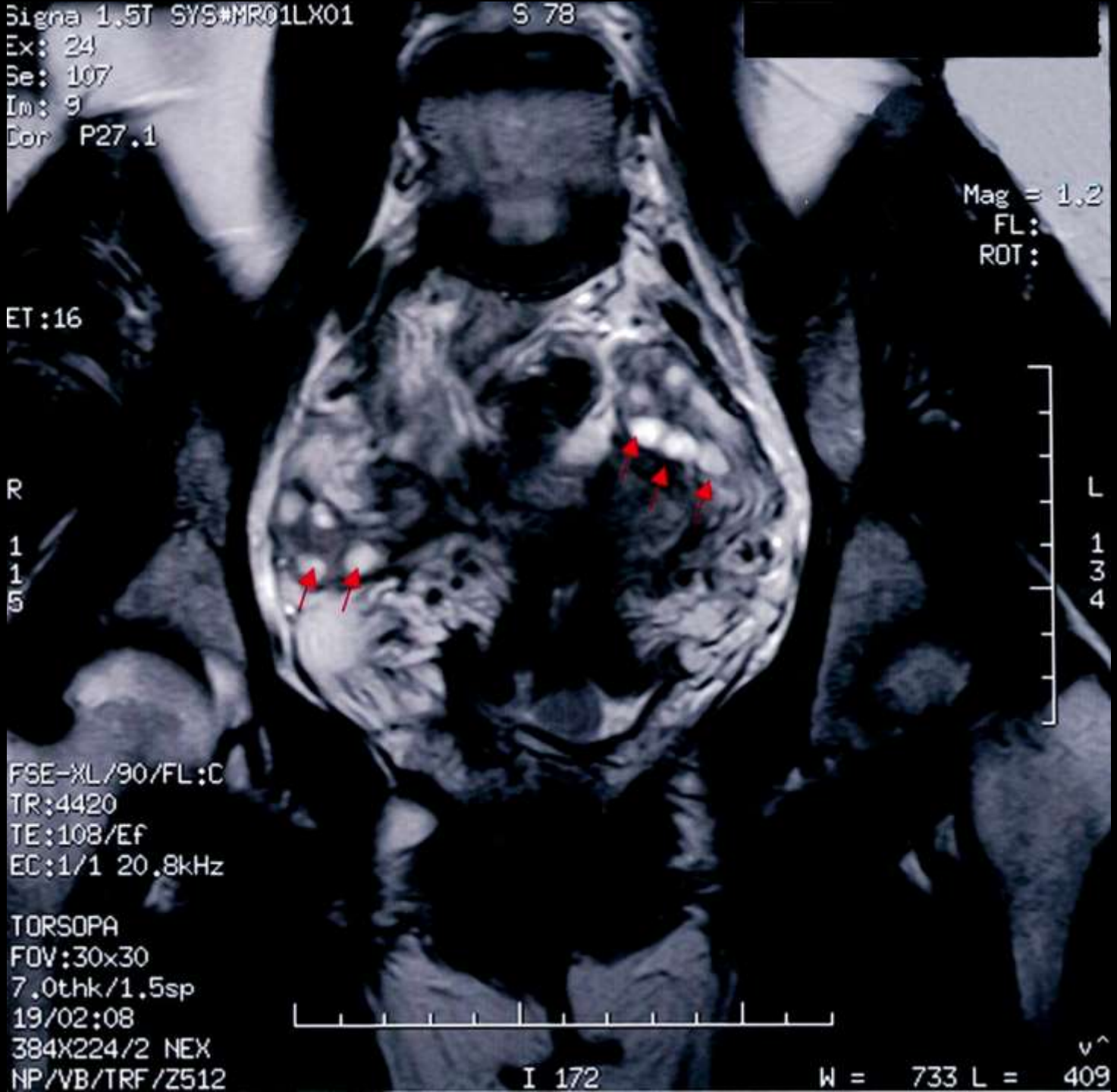
  - ***Physiological :***
    - No clinical symptoms
    - Average ovarian size “3 cm”

  - ***Polycystic:***
    - C.P.
    - Enlarged ovary > 3 cm

F 19Y

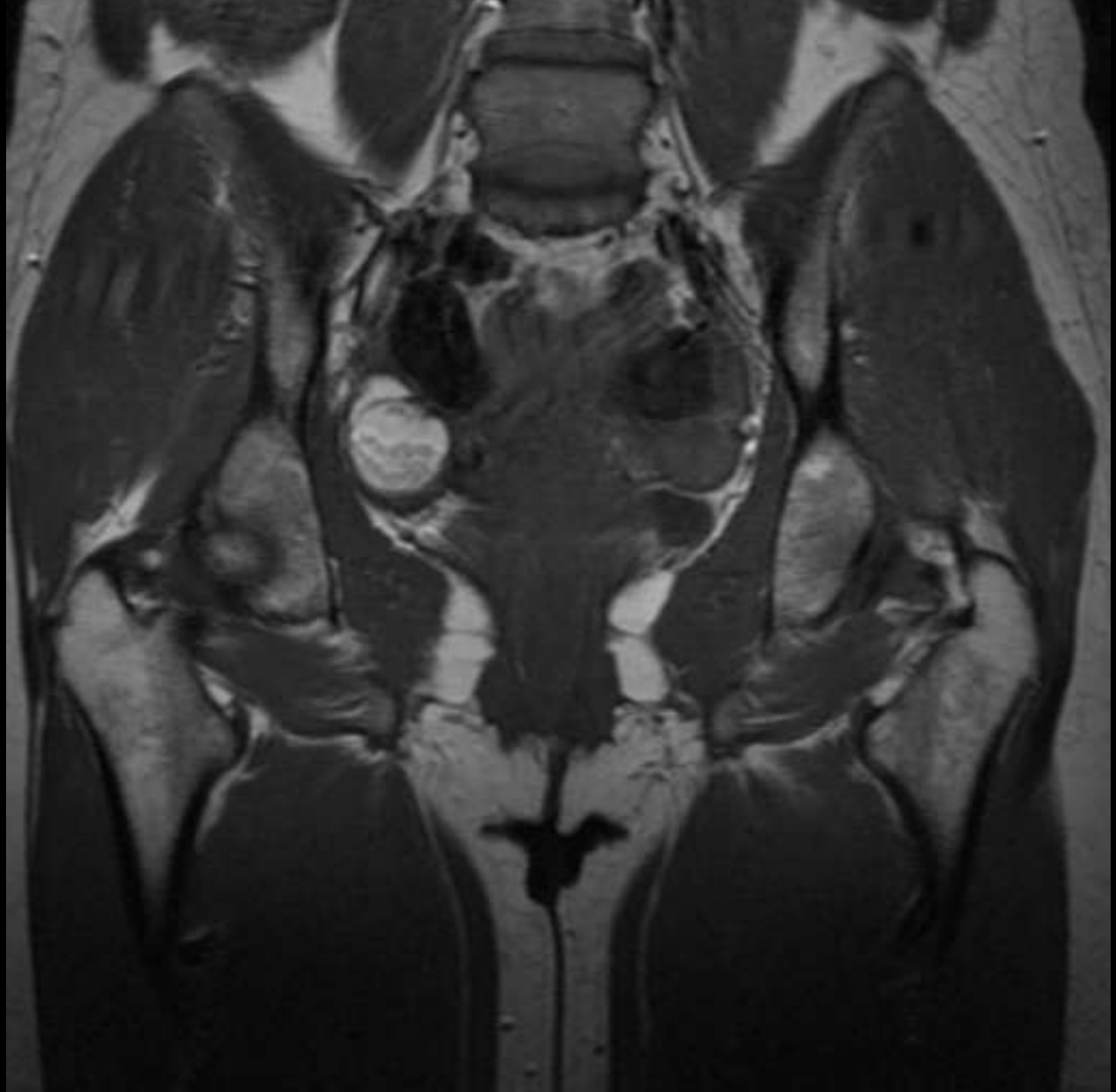


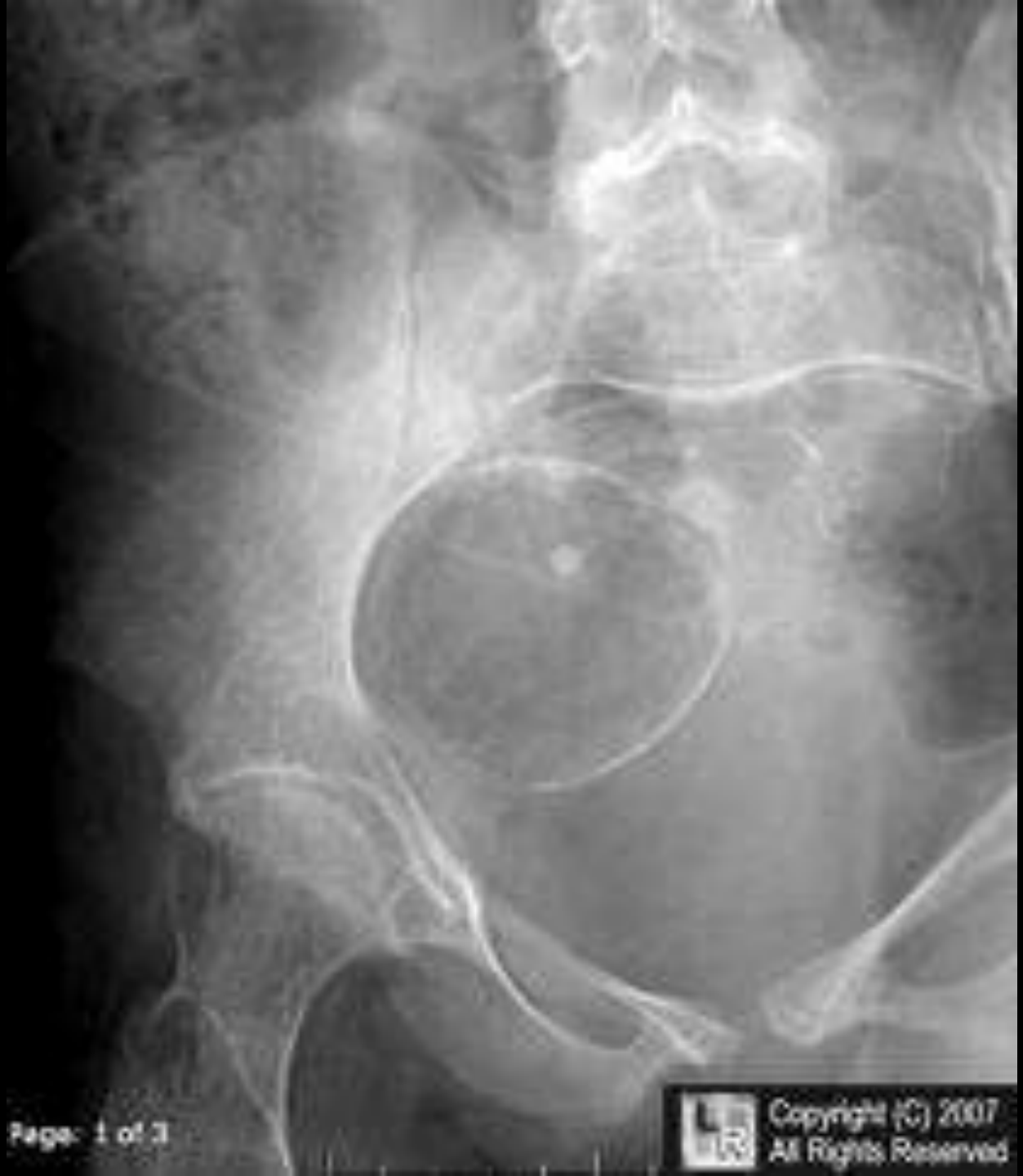
Polycystic ovary in a patient with Cushing syndrome


Signa 1.5T SYS#MR01LX01
S 78
Ex: 24
Se: 107
Im: 9
Cor P27.1
Mag = 1.2
FL:
ROT:
ET:16
R
1
1
5
L
1
3
4
FSE-XL/90/FL:C
TR:4420
TE:108/Ef
EC:1/1 20.8kHz
TORSOPA
FOV:30x30
7.0thk/1.5sp
19/02:08
384X224/2 NEX
NP/VB/TRF/Z512
I 172
W = 733 L = 409

➔ ***Dermoid Cyst***

- 10 :15 % of all ovarian neoplasm
- In Reproductive period “Typically”
- Malignant Transformation > 3 %
  - ***Diagnosis :*** *Depends on presence of*
    - ***FAT*** *“MRI – CT”*
    - *Ca “ CT – X ray – less MRI”*




Page: 1 of 3
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Incidental cystic ovarian lesion

simple cyst or endometrioma

Low Risk

Pre-menopausal

- Any cyst > 7 cm → Further evaluation with MRI or surgical

High Risk

Post-menopausal
or
Other risk factors:
- Personal of familial history of breast or ovarian cancer
- BRCA-1 or -2 carriers
- Lynch-II HNPCC
- Ashkenazi descent

- Any cyst > 7 cm → Further evaluation with MRI or surgical

Simple Cyst

- unilocular, with posterior acoustic enhancement
- unilocular
- thin smooth walls
- no solid components
- no internal flow at Doppler

Low Risk

- Simple cyst < 3 cm → Done. No FU not mentioning in report is o.k.
- Simple cyst 3–5 cm → Done. No FU Attention in report: almost certainly benign
- Simple cyst 5–7 cm → Yearly FU with US until resolved. Attention in report: almost certainly benign
- Simple cyst > 7 cm → Further evaluation with MRI or surgery

High Risk

- Done. No FU not mentioning in report is o.k.
- Yearly FU with US until resolved. Attention in report: almost certainly benign
- Further evaluation with MRI or surgery

- [illegible] cyst < 2 cm
- Simple cyst 2–7 cm
- Simple cyst > 7 cm

Hemorrhagic Cyst

1. cystic masses. Must be complex. Because of:
   - either lace-like internal echoes from fibrin [illegible]
   - and/or a solid-appearing part with [illegible] Hemoglobin breakdown products
   - internal flow at color Doppler
2. cyst walls of variable thickness, often with concentric rings

Low Risk

- Hemorrhagic cyst < 3 cm → Done. No FU not mentioning in report is o.k.
- Hemorrhagic cyst 3–5 cm → Done. No FU Attention in report: almost certainly benign
- Hemorrhagic cyst > 5 cm → 6 – 12 week FU with US resolved → done; unchanged → MRI

High Risk

- 6 – 12 week FU with US resolved → done; unchanged → MRI
- Further evaluation with MRI or surgery

- In early menopause Hemorrhagic cyst < 5 cm
- In early menopause Hemorrhagic cyst > 5 cm
- In late menopause Any hemorrhagic cyst

Endometrioma

- homogeneous, hypoechoic
- diffuse low-level echoes
- no internal flow at color Doppler
- thin smooth, solid measure
- [illegible] chocolate cyst diagnostic
- [illegible] often within cyst wall

Low Risk

- without echogenic foci → may be MOC → 6 – 12 week FU with US
- with echogenic foci → likely endometrioma → FU with US (yearly (?) or surgical removal

High Risk

- 6 – 12 week FU with US to rule out MOC
- FU with US (yearly (?) or surgical removal
- Further evaluation with MRI or surgery

- In early menopause without echogenic foci may be MOC
- In late menopause without echogenic foci may be MOC

Mature cystic teratoma

- Hyperechoic cystic mass
- usually unilocular
- bilateral in ~ 10%
- up to 80% contain calcifications
- characteristically with hyperechoic solid nurse nodule (Rokitansky nodule or dermoid plug)
- Fat-fluid level = fat floating on aqueous fluid
- Multiple thin, echogenic lines = floating hair

Low Risk

- Dermoid < 7 cm → 6 – 12 months FU with US until resected. If not resected → continue FU (yearly ?)

High Risk

- 6 – 12 months FU with US until resected. If not resected → continue FU (yearly ?)

- Dermoid < 7 cm

Any other cyst

Low Risk

Otherwise simple cyst with:
- a single thin septum
- or a single [illegible] calcification

Any cyst with either:
- multiple [illegible]
- thick septations
- focal wall thickening
- any hypoechoic solid component
- solid component with flow
- large amount of ascites with no alternative explanation
- enlarged lymph nodes
- peritoneal or omental masses

→ 6 – 12 week FU with US resolved: done; unchanged: → MRI

→ Surgical resection by oncologic gynaecologist who may request prior imaging-based staging

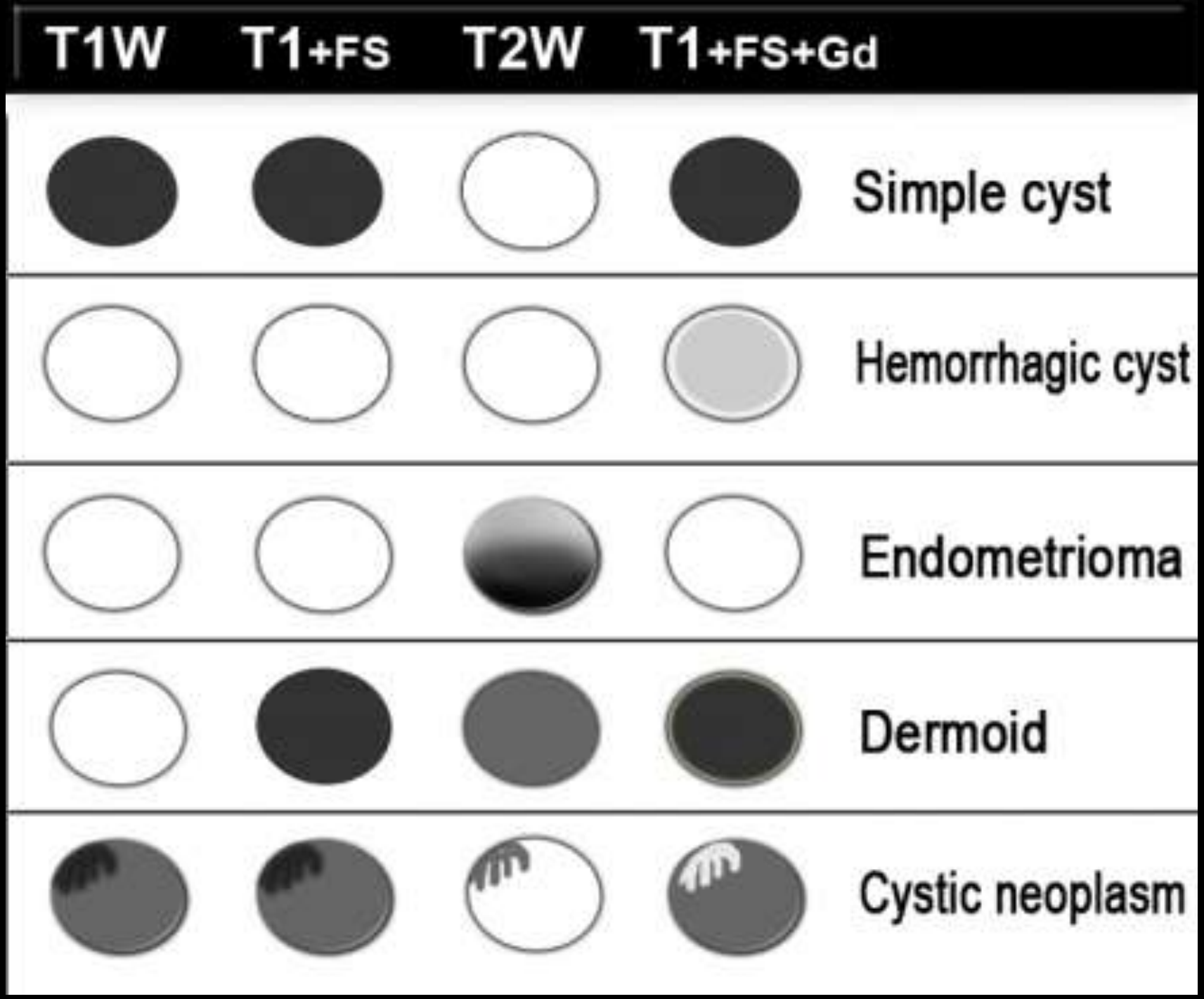
High Risk

→ Further evaluation with MRI or surgery

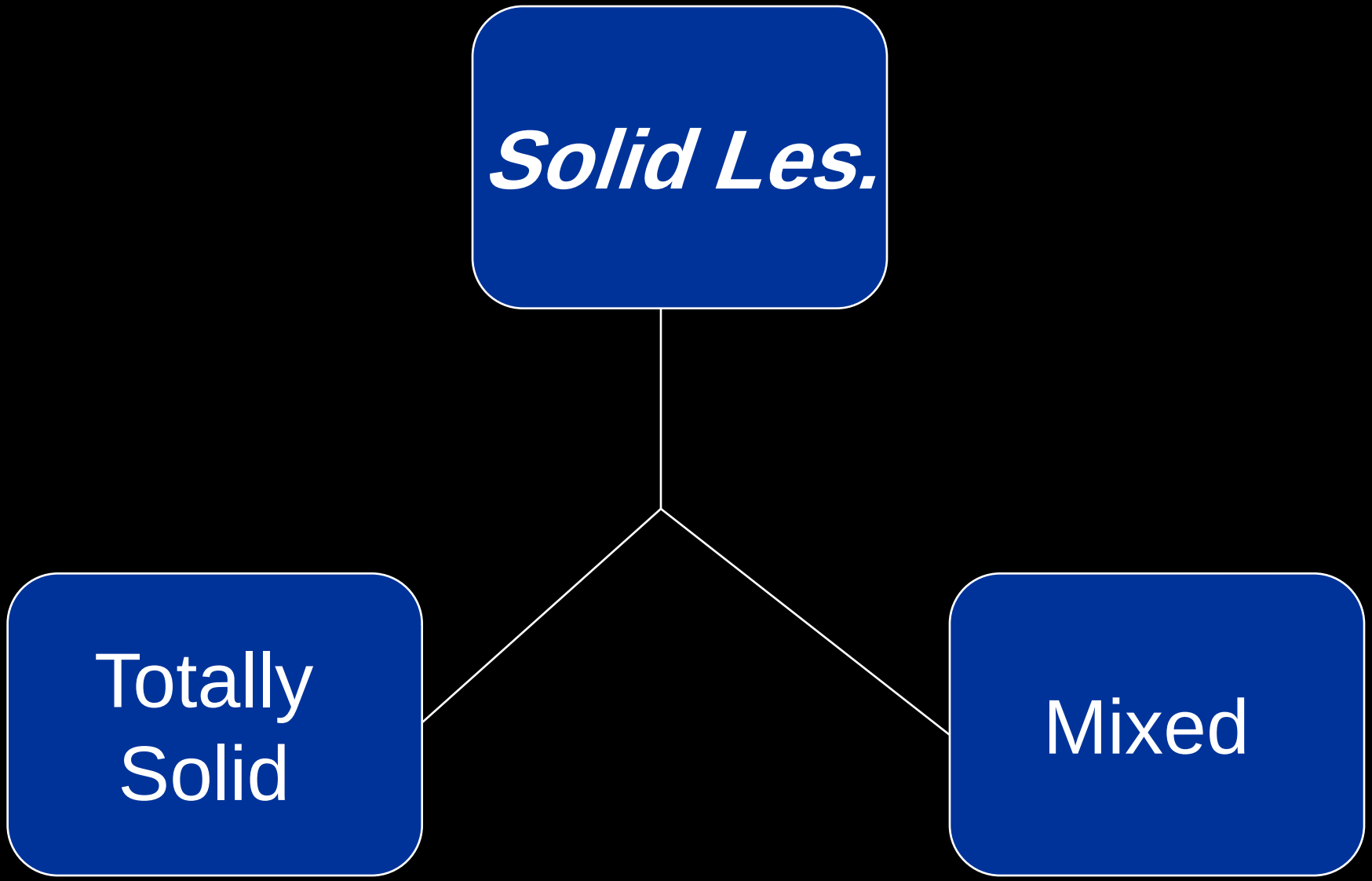
→ Surgical resection by oncologic gynaecologist who may request prior imaging-based staging

Otherwise simple cyst with:
- a single thin septum
- or a single small calcification

Any cyst with either:
- multiple septations
- thick septations
- focal wall thickening
- any hypoechoic solid component
- solid component with flow
- large amount of ascites with no alternative explanation
- enlarged lymph nodes
- peritoneal or omental masses


T1W
T1+FS
T2W
T1+FS+Gd
Simple cyst
Hemorrhagic cyst
Endometrioma
Dermoid
Cystic neoplasm

II- SOLID OVARIAN LESIONS


Solid Les.
Totally Solid
Mixed

- Solid Ovarian Lesion = ***Malignant***

  “Until proved other wise”

- Solid ,, ,, + Known Primary = ***Deposits.***

Ovaries

Ovarian carcinoma

- The 6th among cancers in women
- Poor prognosis because of late presentation
- due to non specific symptoms
- The most common tumors are
  - Adenocarcinoma
  - Cystadenocarcinoma
  - Endometrioid carcinoma
- Less frequent tumors

  Malignant teratoma, dysgerminoma, thecoma,...

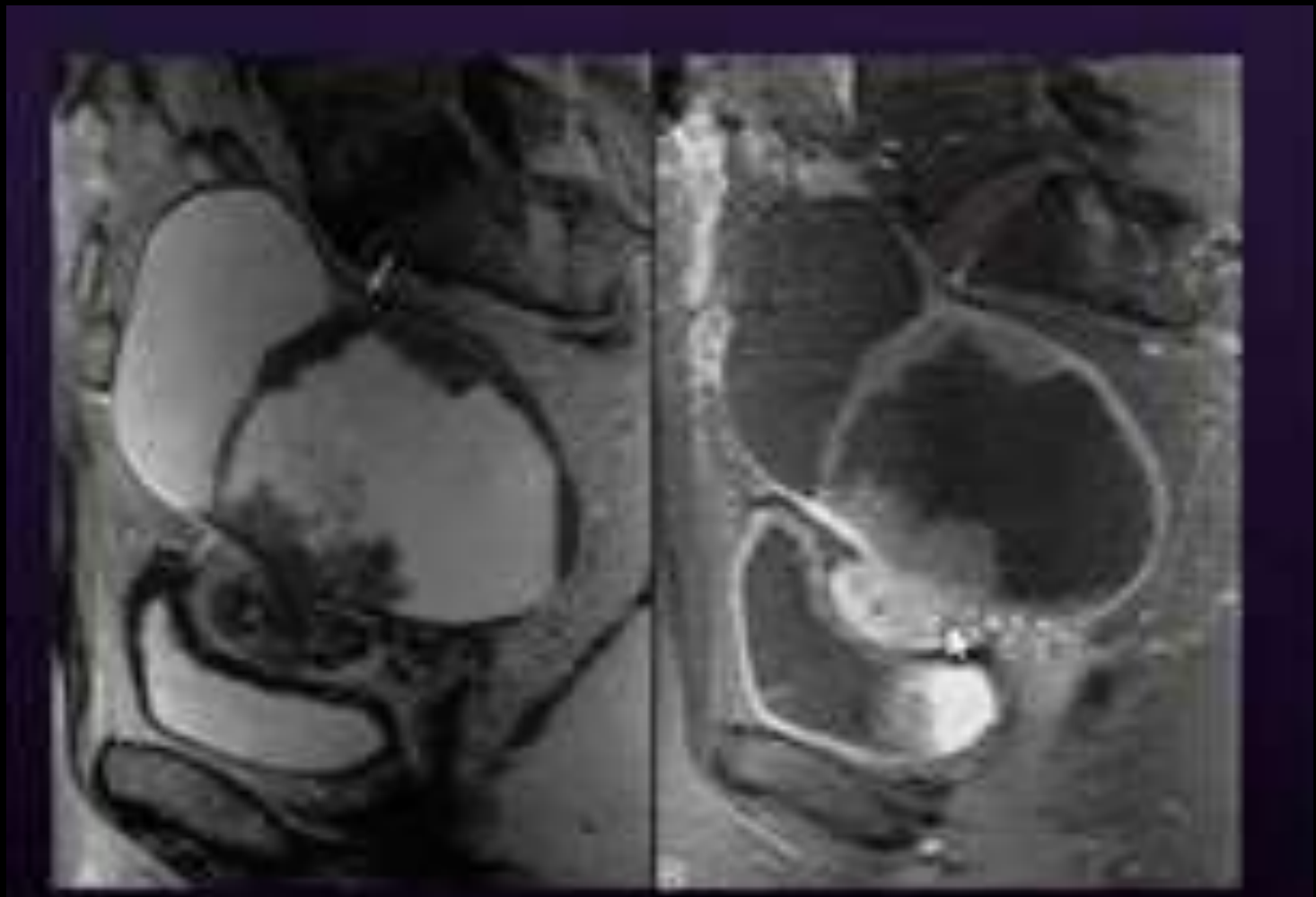
CT appearances

- Unilateral or bilateral adnexal masses
- Mixed CT densities partly cystic / solid
- Cystadenocarcinomas are mainly cystic
- CT densities are non specific

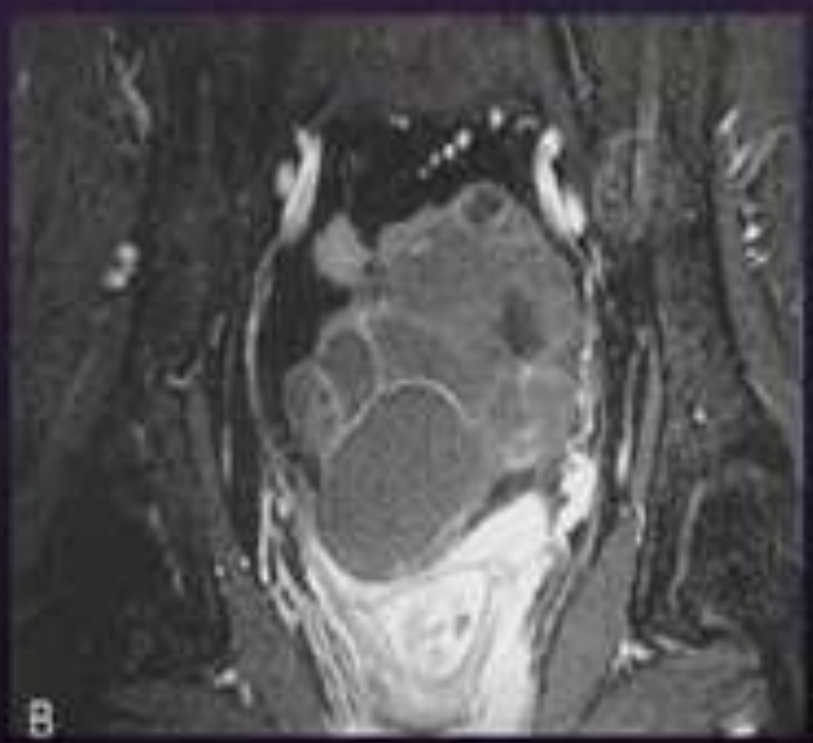
Other role for imaging

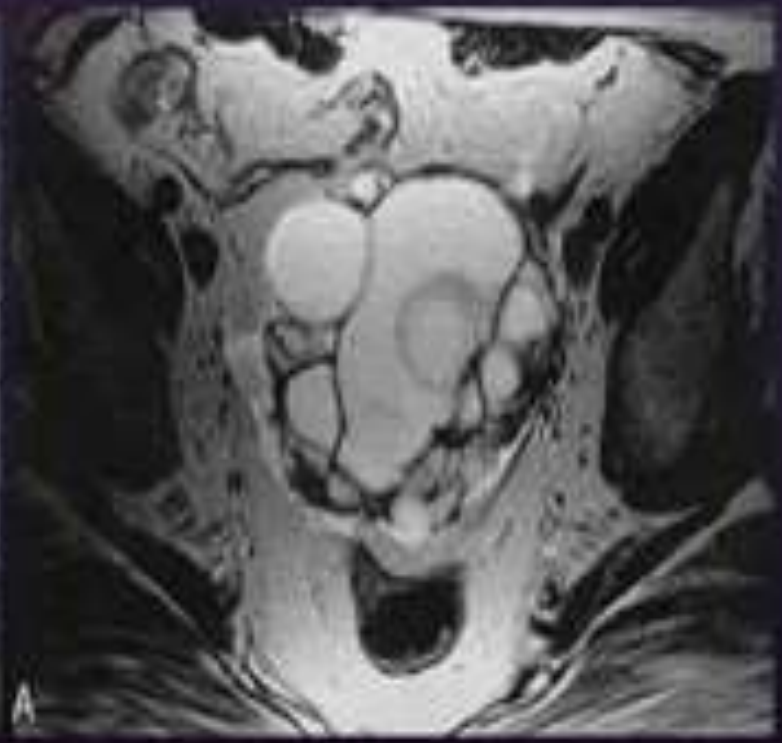
- Ascites
- Lymph nodes
- Peritoneal implants
- Invasion of adjacent pelvic organs

- MRI appearances are non specific
- Low signal in T1, high signal in T2
- Enhancement similar to CT
- MRI value
  - Multiple planar imaging
  - Fat within teratomas
  - Hemorrhage in serous tumors



Ovarian serous cystadenocarcinoma

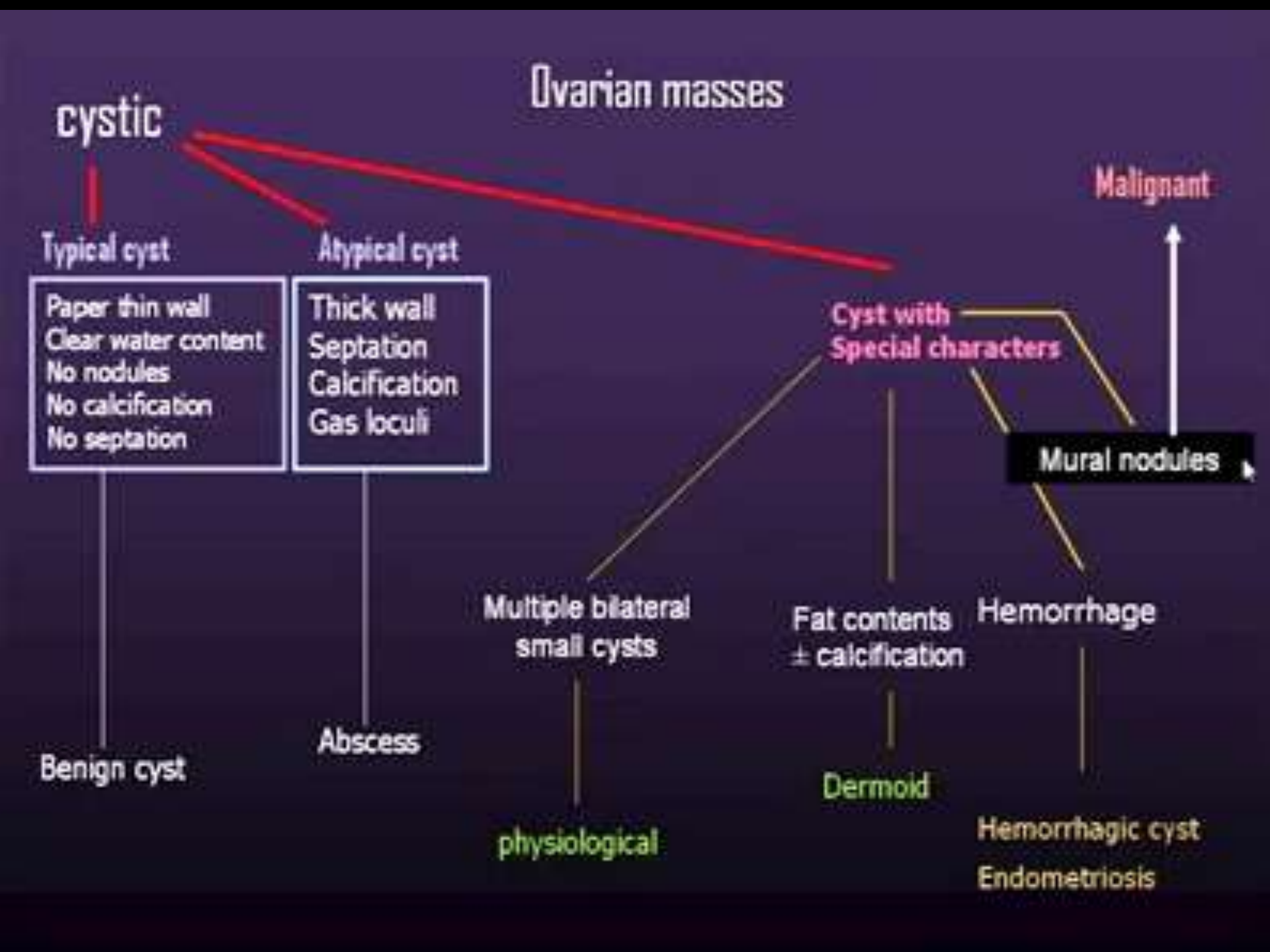




Mucinous cystadenocarcinoma

Krukenberg's tumors

- 6% of ovarian tumors
- Metastatic deposits to the ovaries from stomach, intestine, breast, thyroid
- Usually solid and bilateral
- Poor prognosis with mortality rate 90% after discovery


Ovarian masses
cystic
Malignant
Typical cyst
Atypical cyst
Paper thin wall
Clear water content
No nodules
No calcification
No septation
Thick wall
Septation
Calcification
Gas loculi
Cyst with
Special characters
Mural nodules
Multiple bilateral
small cysts
Fat contents
± calcification
Hemorrhage
Benign cyst
Abscess
physiological
Dermoid
Hemorrhagic cyst
Endometriosis

UTERINE LESIONS

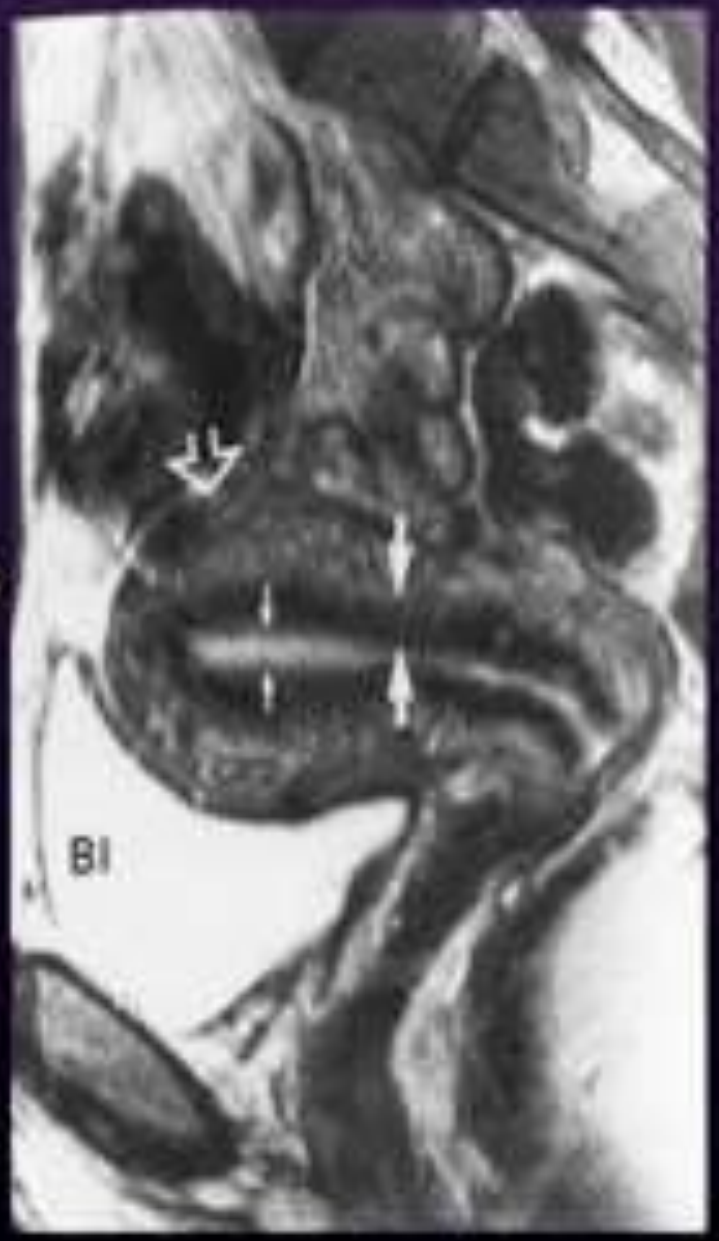
Uterus

Normal findings

Sagittal T2 WIs

- 6-9 cm in length, 3-5 cm in width
- Intermediate signal intensity on T1 WIs
- On T2 WIs 3 layers
  - Endometrium 1-3 & 3-7 mm thickness
  - Junctional zone

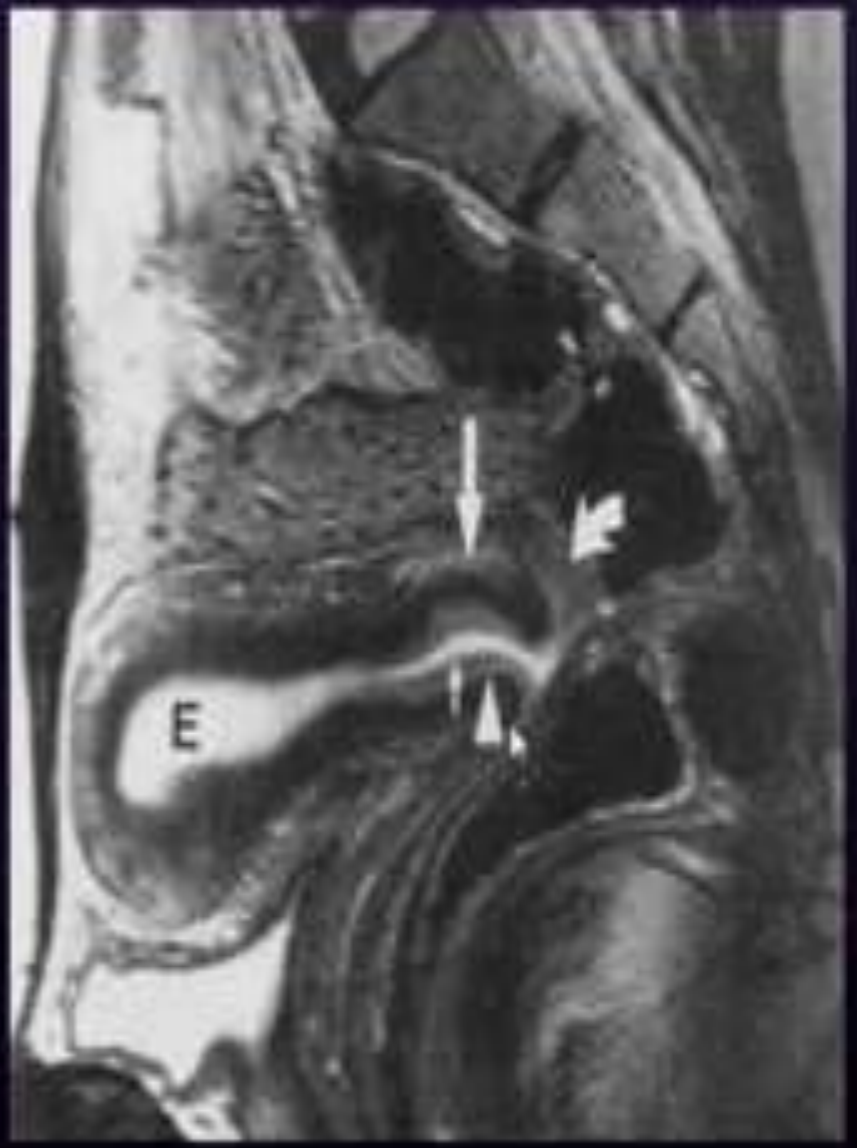
    [inner myometrium low water contents]
  - Myometrium + JZ= 14-21 mm



Cervix

Normal findings

- 2.5- 3.2cm
- **On T2 WIs**
  - Inner zone of high signal (mucous)
  - Main bulk (stroma) low signal intensity



Zonal anatomy

Uterine lesions

Enlarged uterus
With homogenous density

Whole uterus

Cervix only

fibroid

Consider Cancer
Cervix then fibroid

US,MRI

Slightly enlarged
Uterus
With retained secretion
In elderly

? Endometrial carcinoma

US, MRI
And biopsy

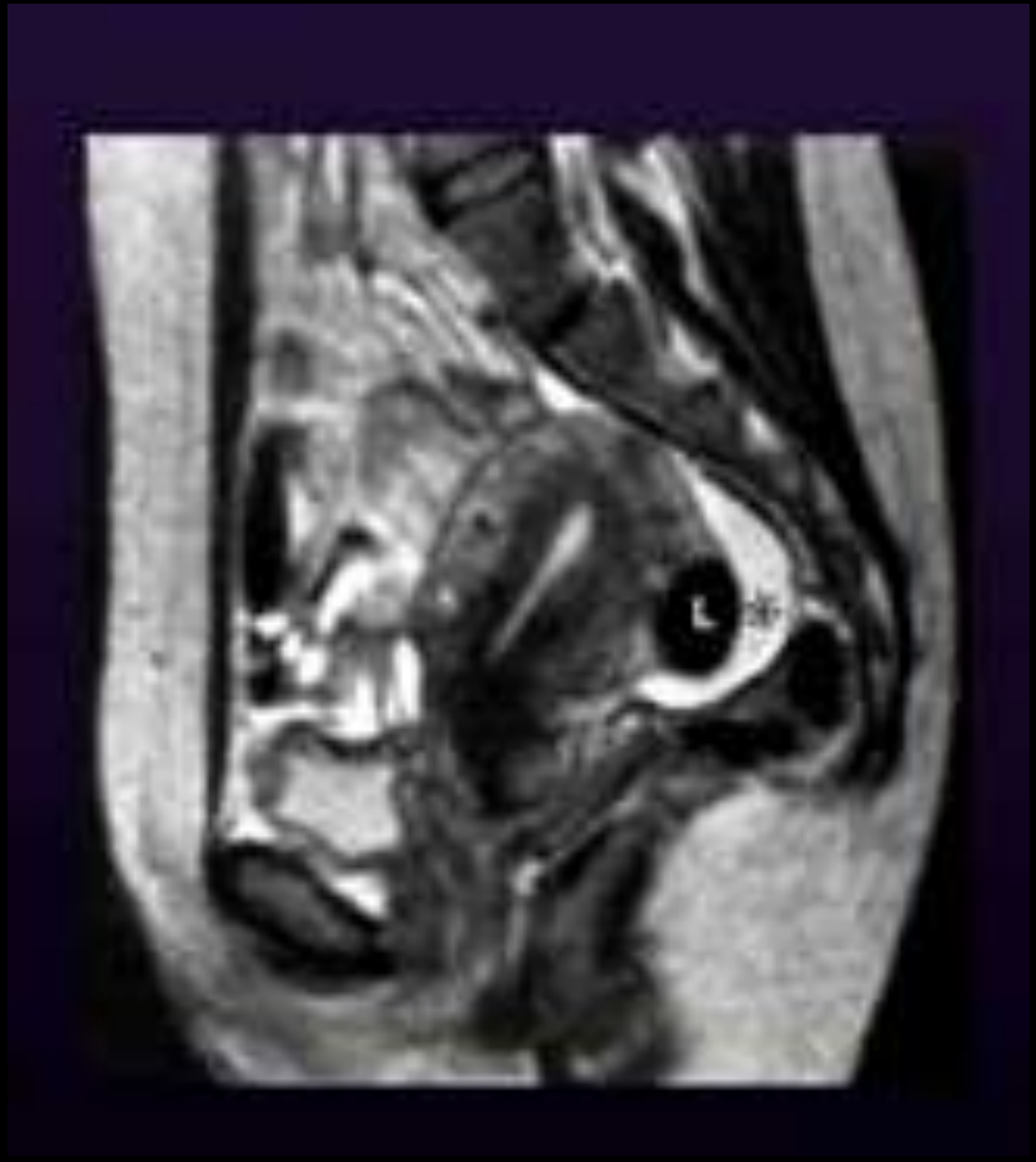
➔ FIBROID

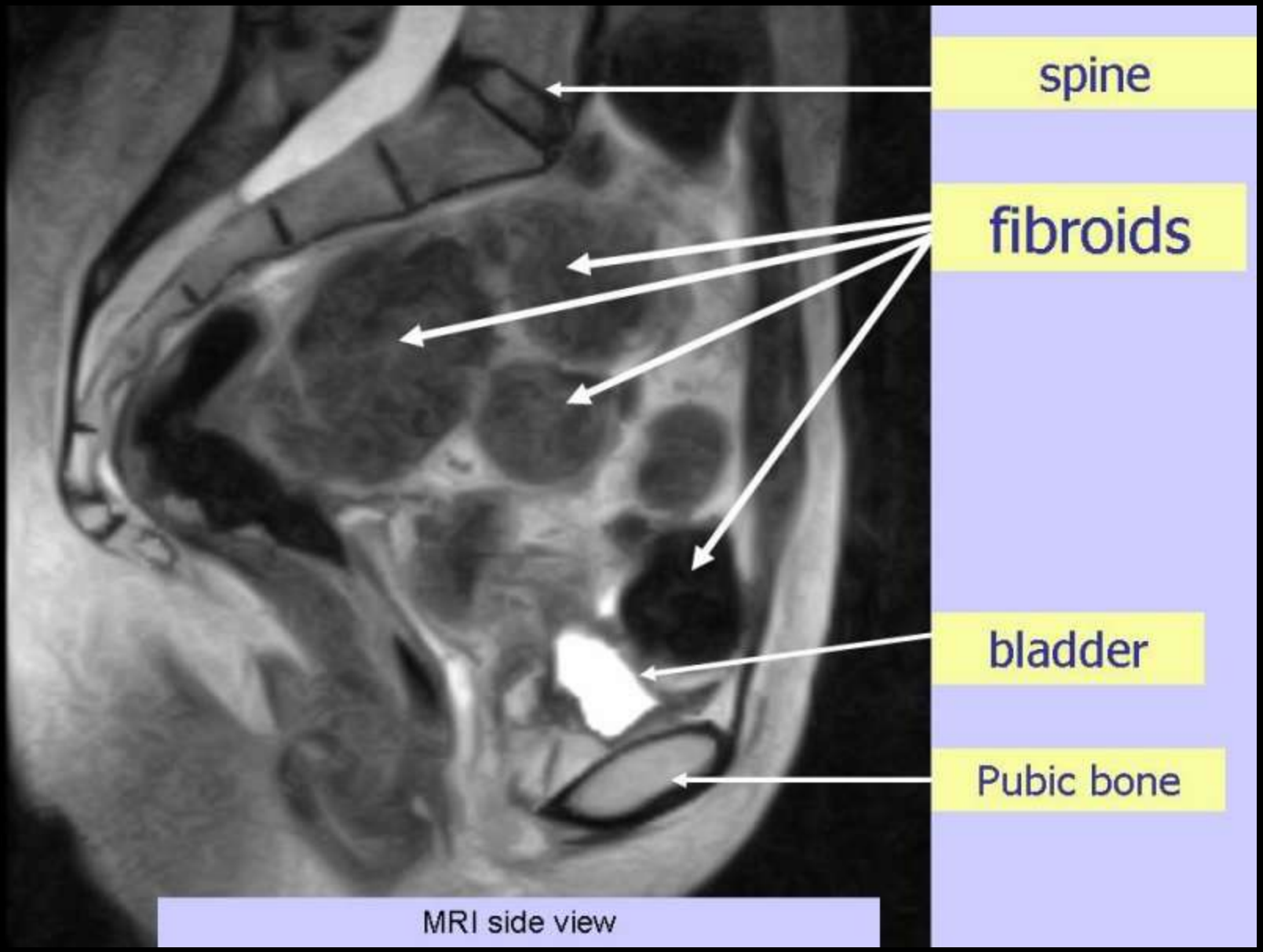
- most common tumor of the uterus (in 25% of women> 35 years)
- ***MRI Features:***
  - Well defined
  - Low signal in T1 & T2 ***unless Degenerated***
  - Homogenous Enhancing

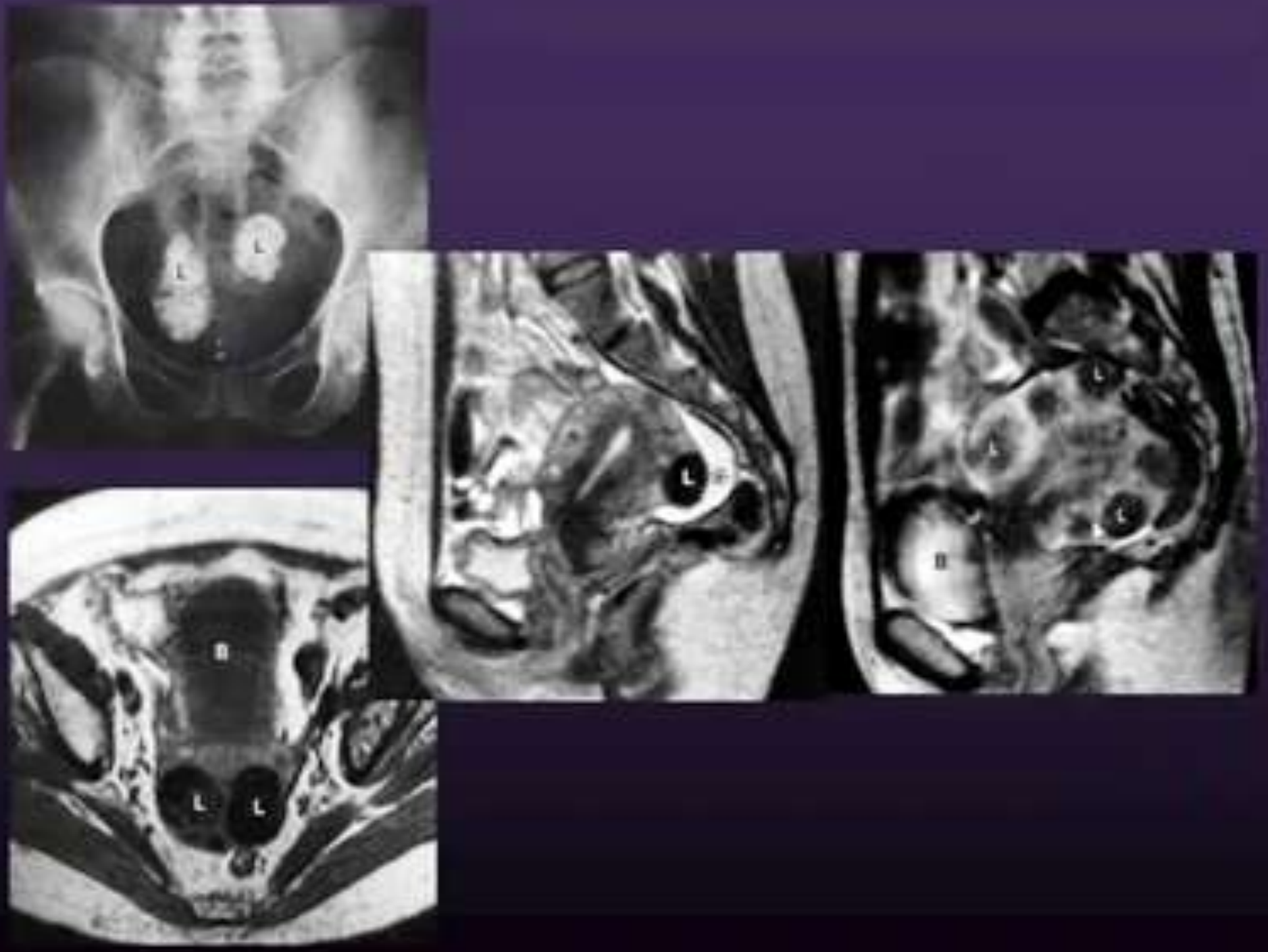
  ➔ Malignant Transformation ➔ 0.1 : 0.6 % ➔ ***Hazy outline***

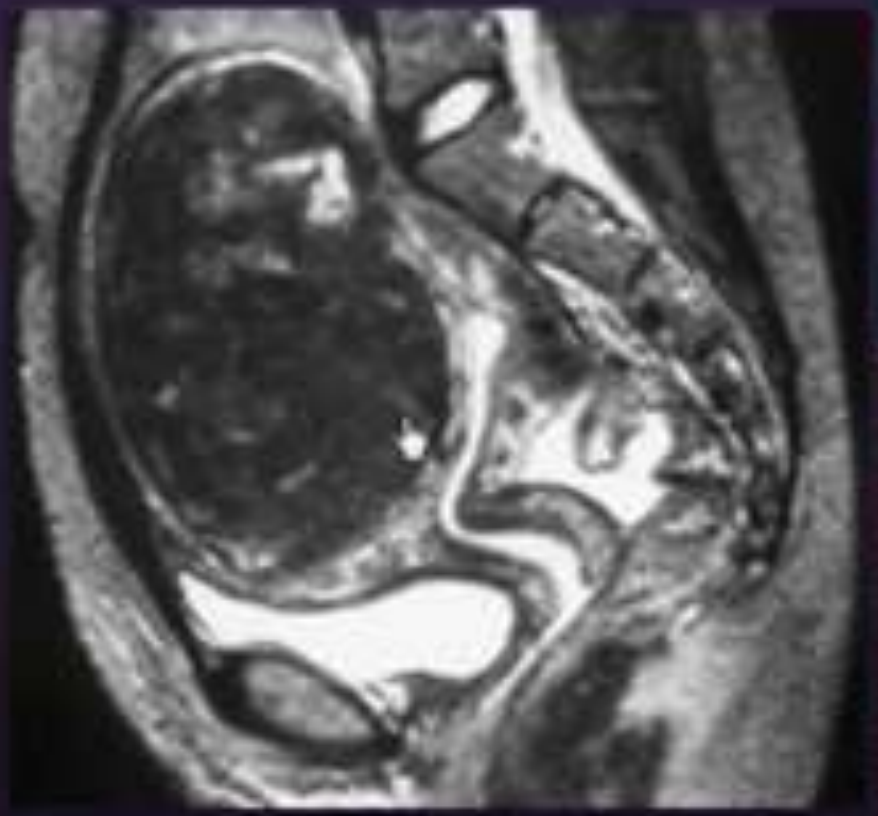
MRI	TI	T2	Contrast
Lieomyoma	Low signal	Low signal	Homogenous enhancement

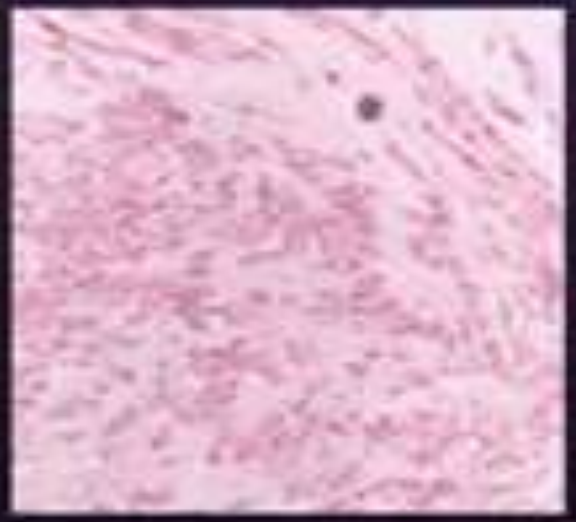
CT	No contrast	Contrast
Lieomyoma	Similar to the uterus ± calcifications	Homogenous enhancement




spine
fibroids
bladder
Pubic bone
MRI side view







Typical leiomyoma in a 37-year-old woman. Sagittal T2-weighted MR image shows a well-demarcated mass of low signal intensity

Photograph of the cut surface of the resected lesion shows a white mass with

Photomicrograph shows hyaline degeneration throughout the lesion (*).

➔ Endometrial Carcinoma

- > 50 y
- Risk factors ***(increased estrogen):***

null parity, failure of ovulation, obesity, late menopause.

- ***<u>Radiographic features</u>***
- Prominent, thick echogenic “US - endometrium “ (usually cannot be differentiated from endometrial hyperplasia or polyps)
- Obstruction of internal os may result in:

- Hydrometra - Pyometra - Hematometra

- ***Staging:***

(combined US and CT accuracy: 80%-90%)

- ***Stage 1, 2***: confined to uterus

(tumor enhancement < myometrial enhancement)

- ***Stage 3, 4:*** extrauterine

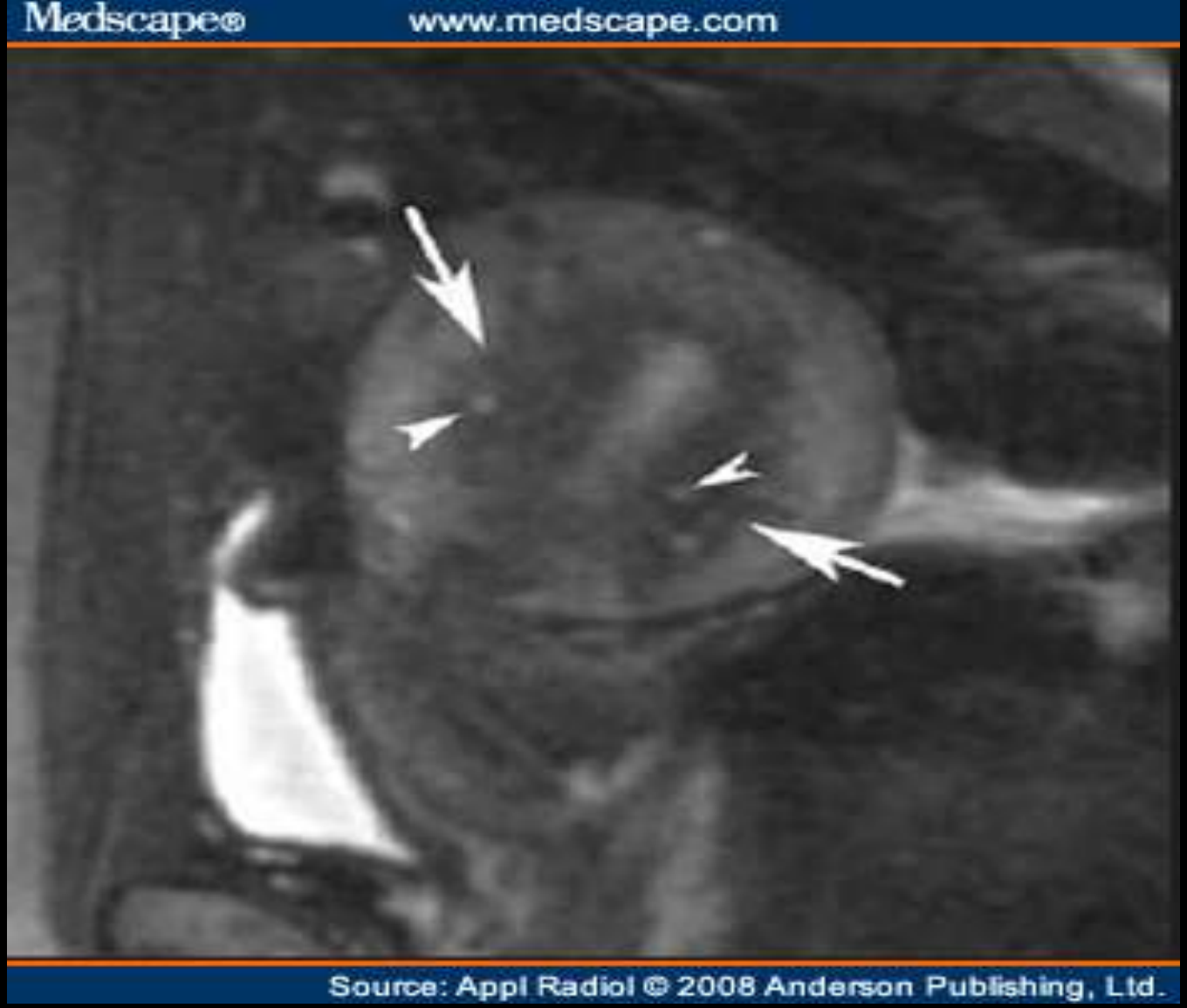
- ***MRI***: variable appearance

ADENOMYOSIS

- Heterotopic endometrial glands and within the myometrium ***"internal endometriosis".***
- ***Clinical***: dysmenorrhea, bleeding, Asymptomatic (5%-30%).

➔ ***MRI***

- T2W MR imaging is ***study of choice***.
- ***Focal or diffuse thickening of the junctional zone*** (> 12 mm) is the ***key finding***.
- High Signal endometrial foci within myometrium
- Enlargement of uterus.



- Diffuse adenomyosis. sagittal fat-suppressed T2-wI → ***diffuse thickening of the low-T2-signal junctional zone*** (arrows). Scattered T2 high signal foci (arrowheads) are consistent with ***endometrial cysts.***

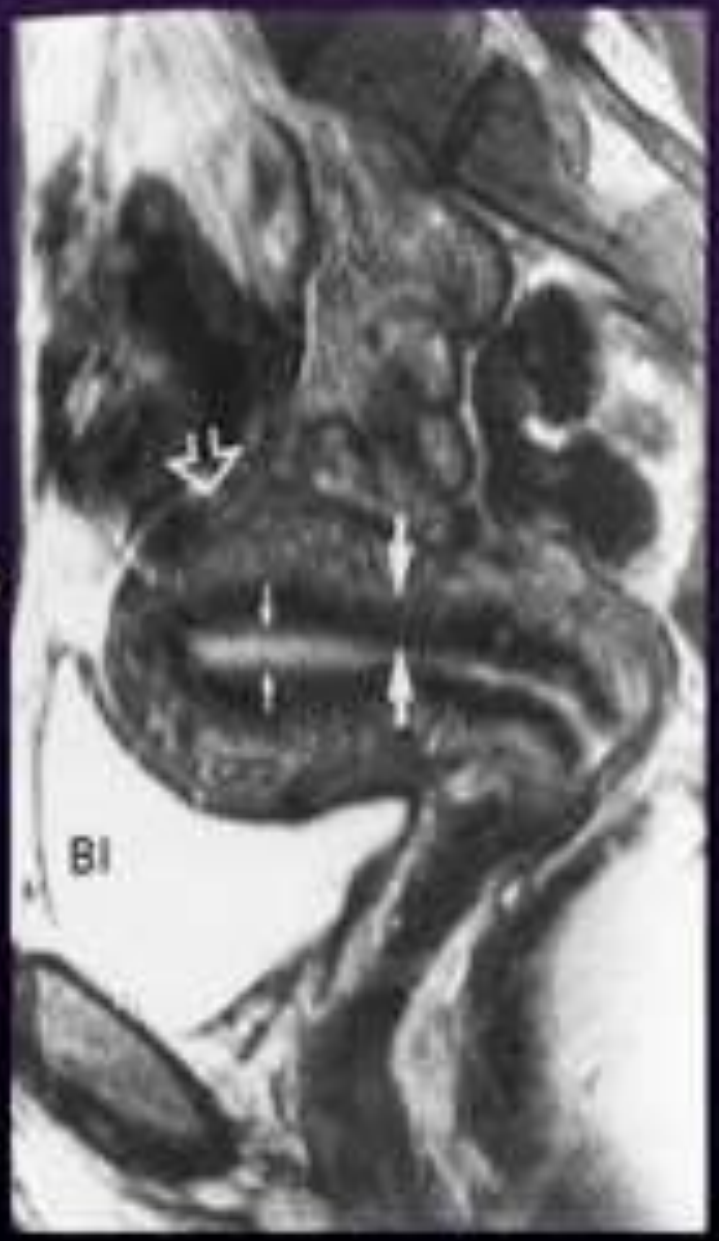
Uterus

Normal findings

Sagittal T2 WIs

- 6-9 cm in length, 3-5 cm in width
- Intermediate signal intensity on T1 WIs
- On T2 WIs 3 layers
  - Endometrium 1-3 & 3-7 mm thickness
  - Junctional zone

    [inner myometrium low water contents]
  - Myometrium + JZ= 14-21 mm



Endometriosis

- MRI of the pelvis remains the method of choice to diagnose all lesion sites of endometriosis.
- Due to spontaneous T1 hyperintensity of blood after 8 days of bleeding← MRI ***should not*** be scheduled earlier than day 8 of the menstrual cycle.

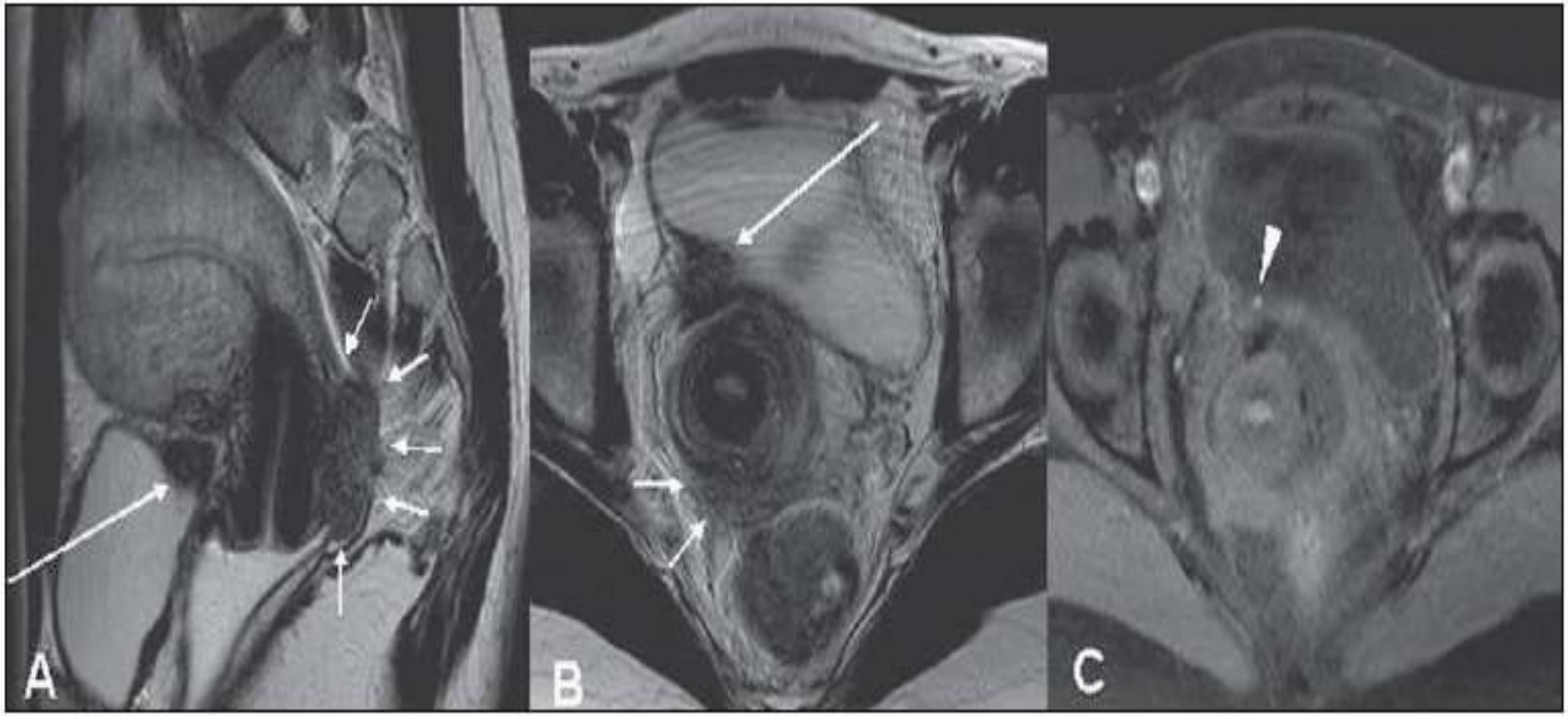
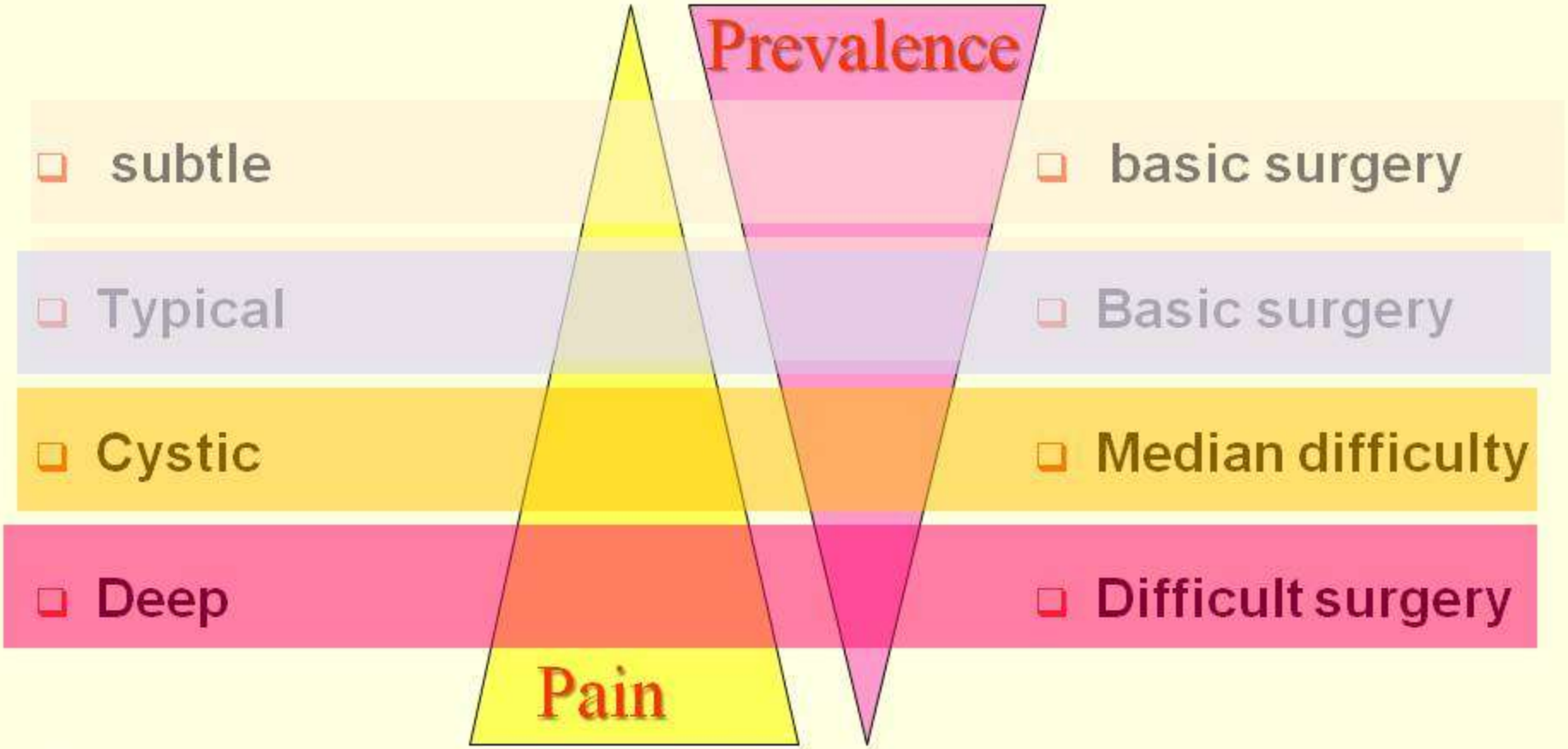


Figure 2. Sagittal (**A**), and axial (**B**) T2-weighted images, and axial, T1-weighted image with fat suppression (**C**) demonstrate hypointense focal thickening of the right posterolateral wall of the bladder on T2-weighted sequence (long arrows), with intermingled minute bleeding foci visualized on T1-weighted sequence with fat suppression (arrowhead). There is also an extraperitoneal, irregular, ill-defined, hypointense mass on T2-weighted sequence (fibrotic component), involving the posterior compartment, highlighting the uterosacral ligaments, the retrocervical region and the rectovaginal septum (short arrows).

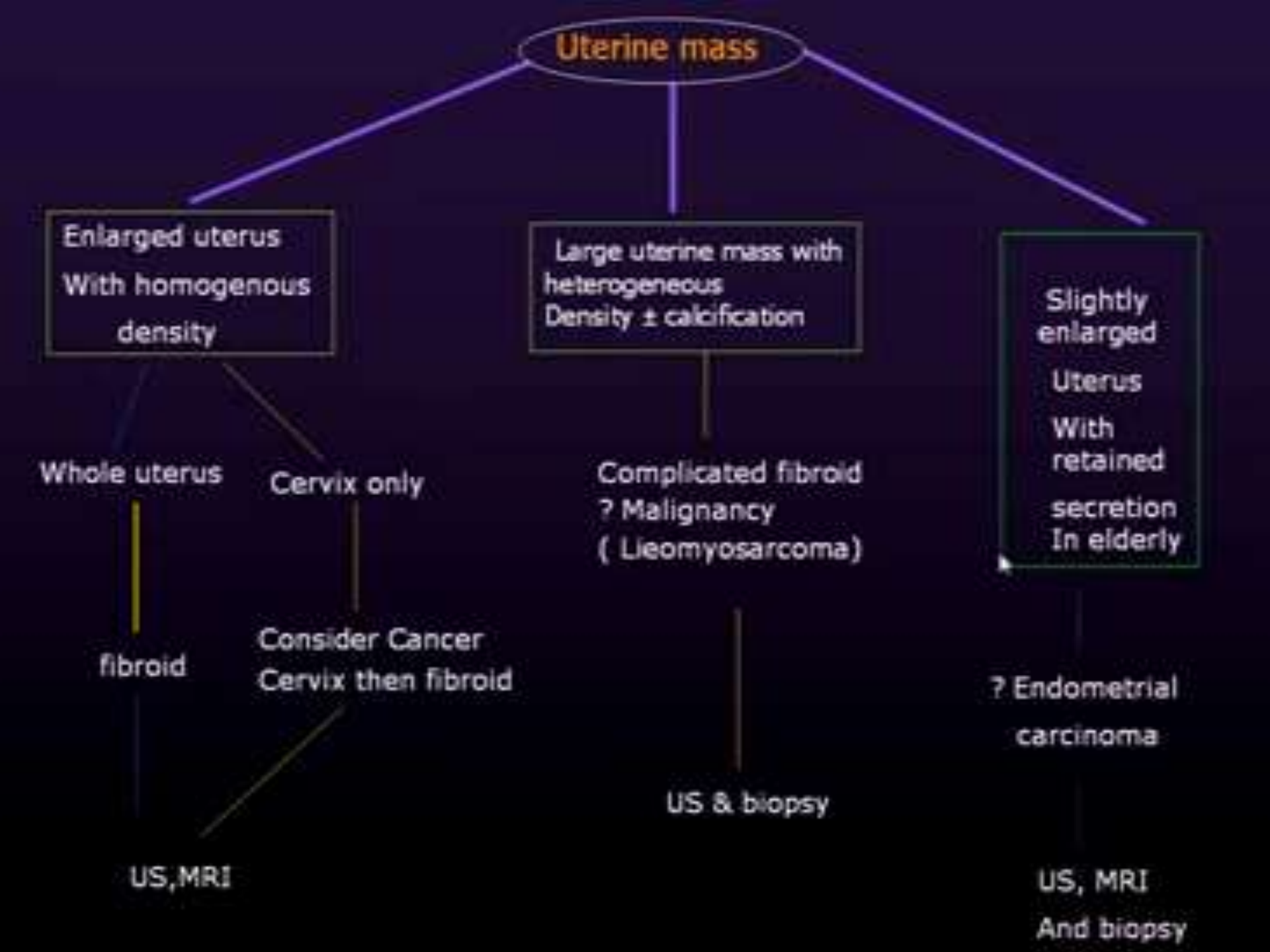
Endometriosis and Pain



Typical Endometriosis : frequent pathology & basic surgery

Deep Endometriosis: a rare disease & advanced surgery

Gruppo Italo- Belga : *Prof P. Koninckx Drssa A. Ussia*


Uterine mass
Enlarged uterus
With homogenous
density
Large uterine mass with
heterogeneous
Density ± calcification
Slightly
enlarged
Uterus
With
retained
secretion
In elderly
Whole uterus
Cervix only
Complicated fibroid
? Malignancy
(Lieomyosarcoma)
fibroid
Consider Cancer
Cervix then fibroid
? Endometrial
carcinoma
US & biopsy
US,MRI
US, MRI
And biopsy

Cervical Carcinoma

Radiographic features

- Cervical stenosis with endometrial fluid collections (common)
- ***Mass in The cervix Considered CARCINOMA until proved other wise.***
- Accuracy for detecting pelvic nodal metastases by CT: 65%

MRI:

- tumor appears ***hyper-intense*** with respect to normal uterus on T2WI
- Additional findings in large (> 4 cm) tumors:
  - Blurring and widening of the low-intensity uterine junctional band
  - Broadening of the central uterine high-intensity zone

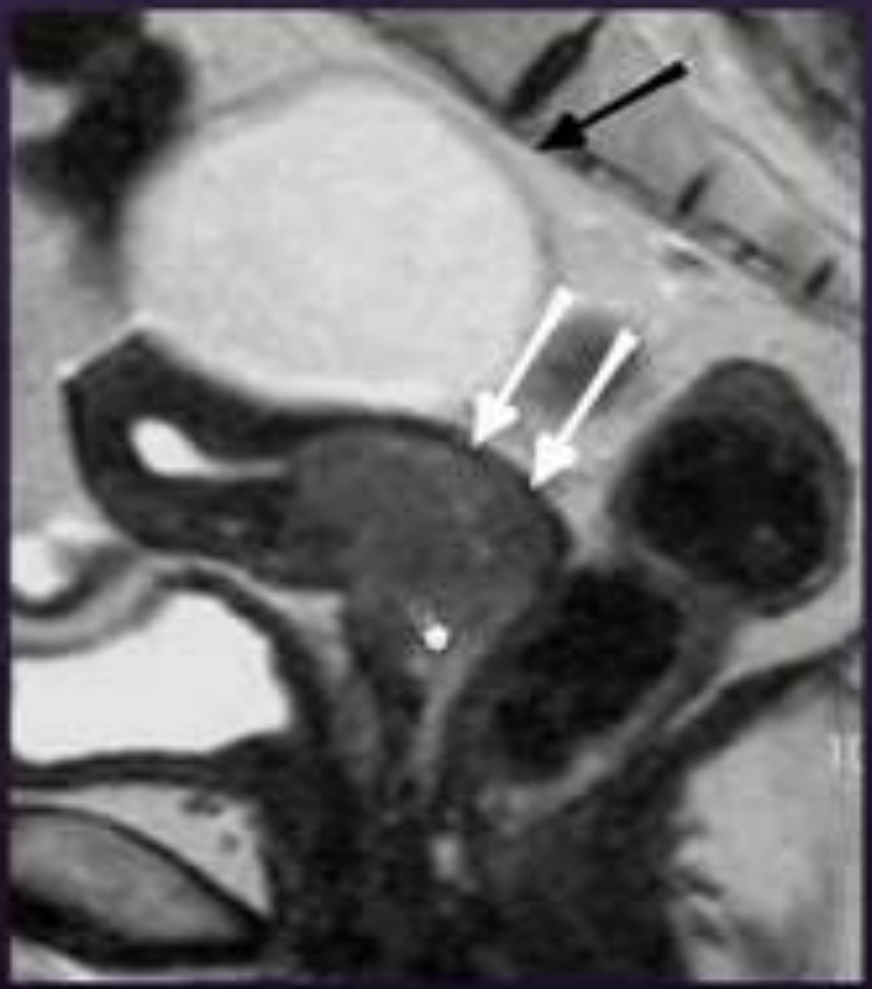
Staging

Stage IA: ***confined*** to cervix
Stage IB: may extend to uterus

Stage IIA: extension into upper vagina
Stage IIB: parametrial involvement

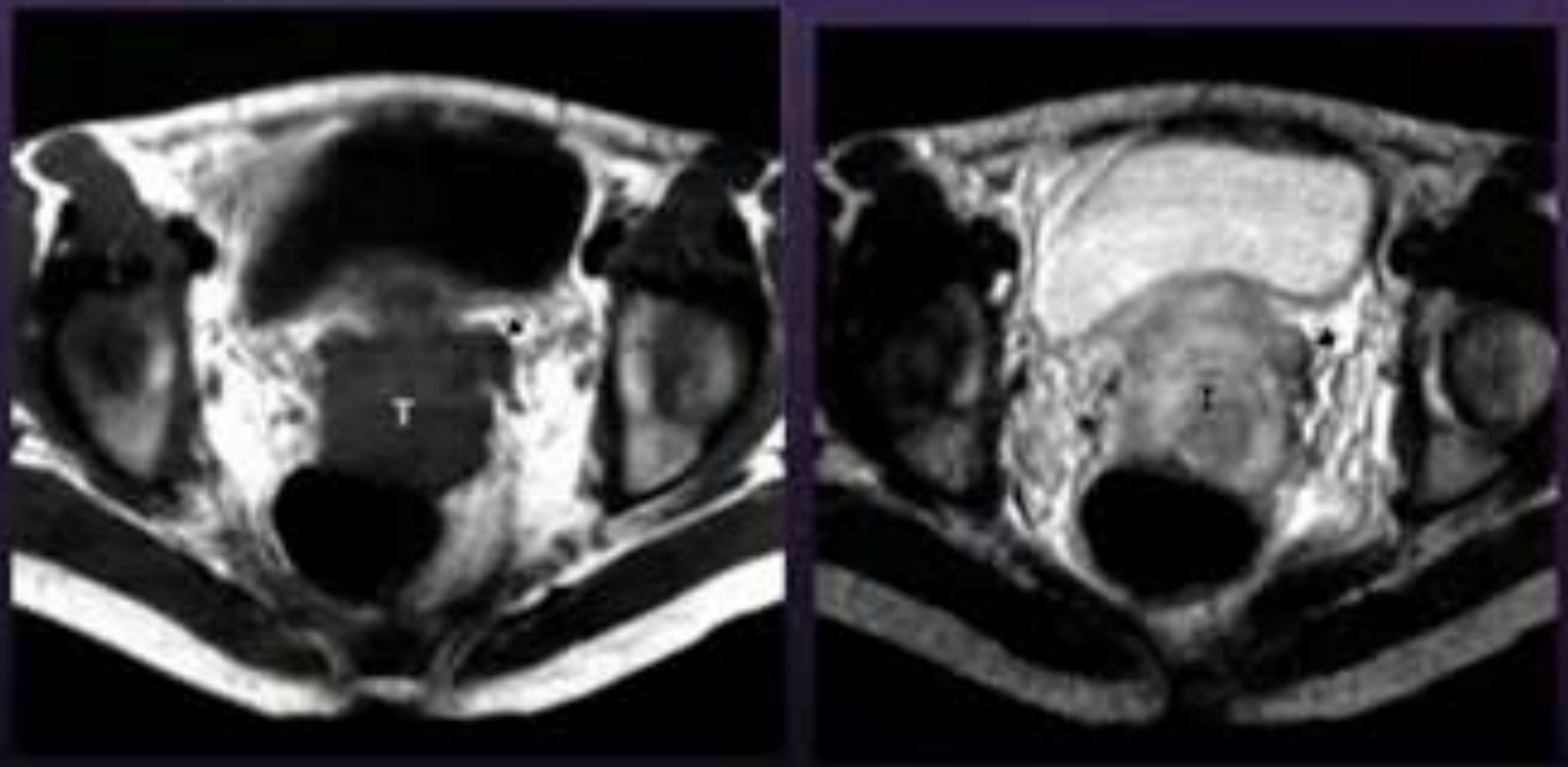
Stage IIIA: extension into lower vagina
Stage IIIB: pelvic wall (hydronephrosis)

Stage IVA: spread to adjacent organs
Stage IVB: spread to ***distant*** organs

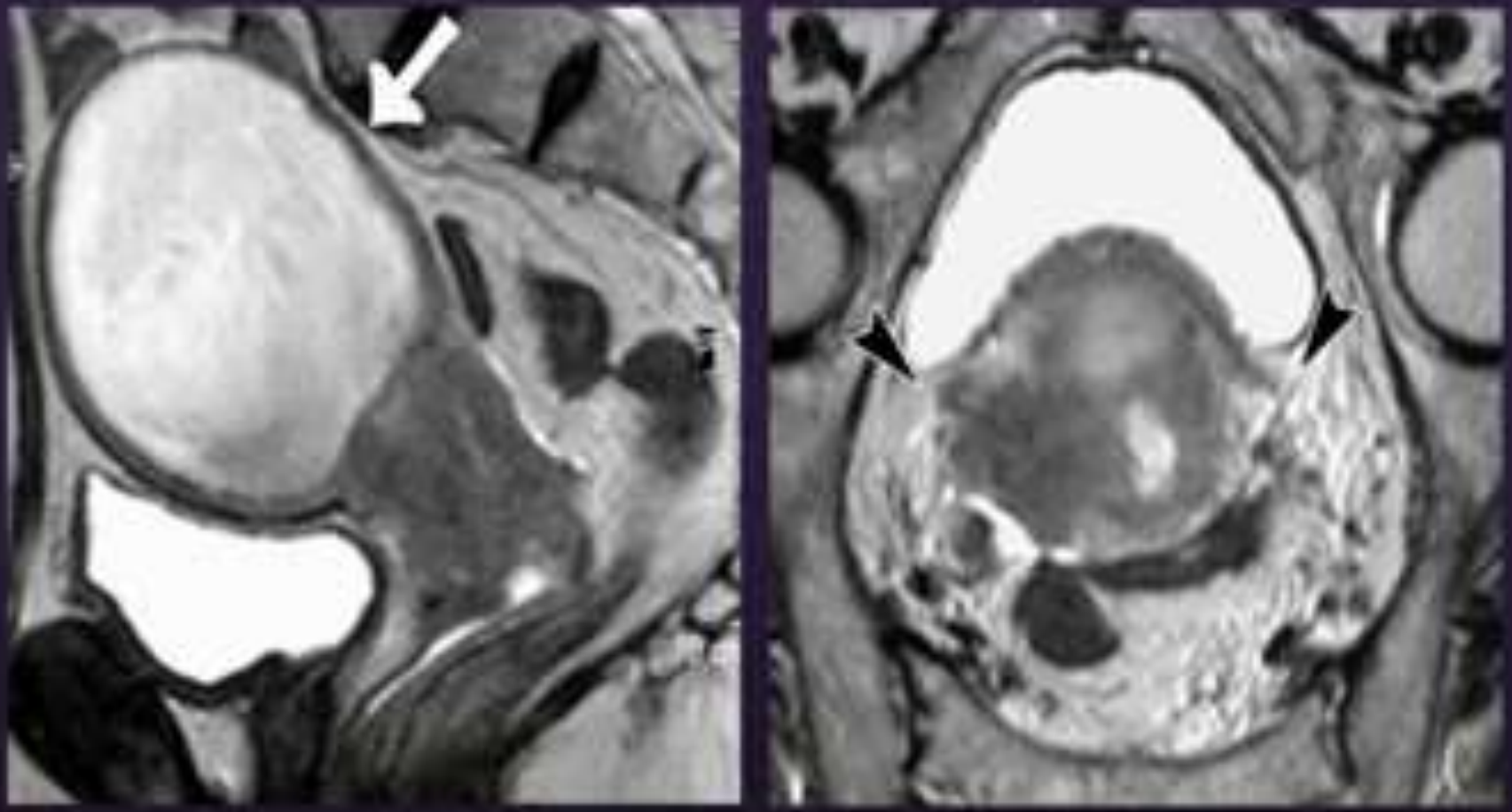


Cervical carcinoma in a 59-year-old woman. Sagittal T2-weighted MR image shows a slightly hyperintense mass that replaces the cervix (white arrows). The lesion is located almost within the cervical canal. The patient also has a mature cystic teratoma of the right ovary, which is seen as a cystic mass (black arrow) behind the uterus.

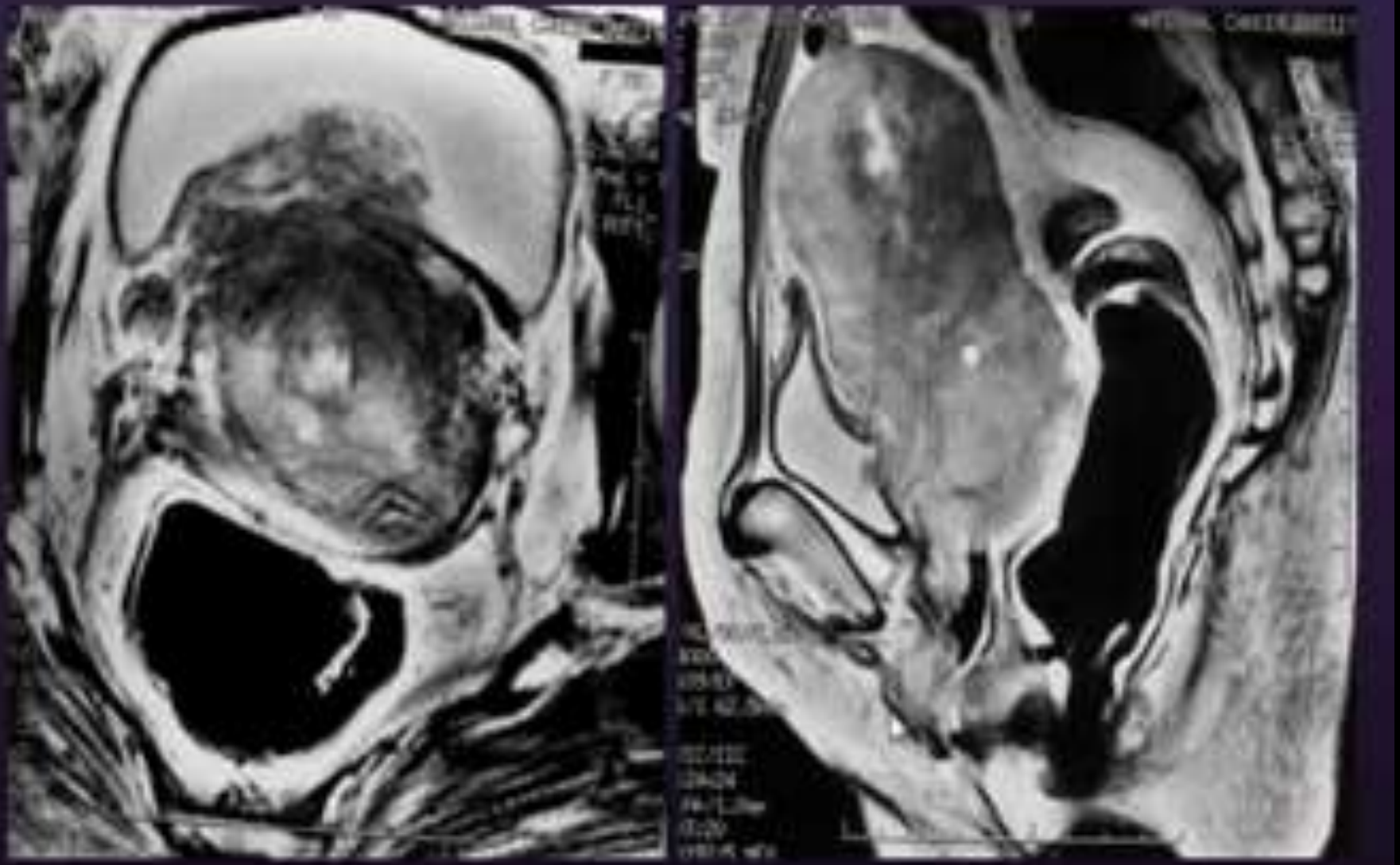
MR	T1	T2	Contrast
Cervical Carcinoma	**Low signal** Extra uterine invasion Lymph nodes	**high signal** Uterine and vaginal invasion	Enhancement is of little diagnostic value



Cancer cervix with parametrial extension

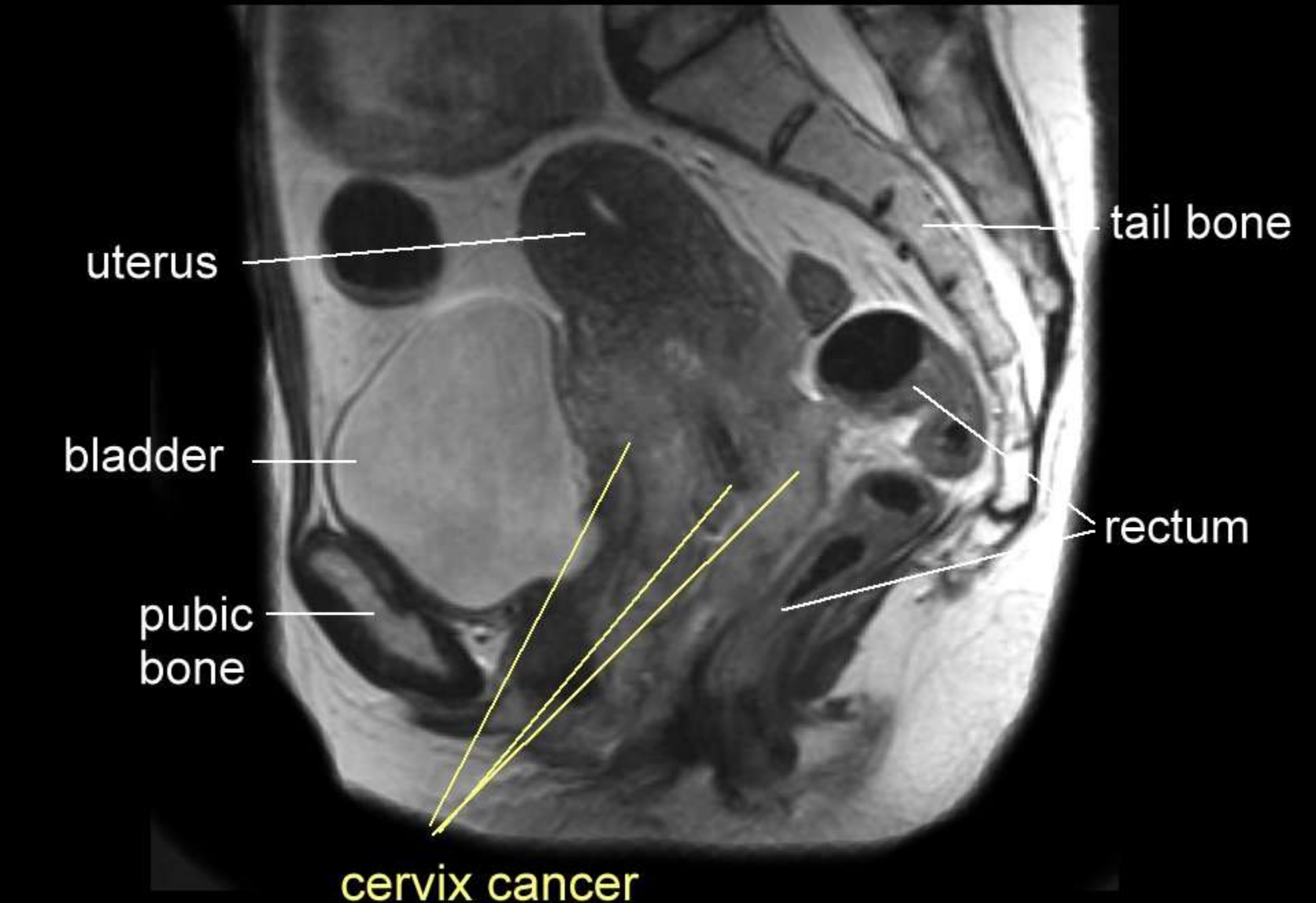


Cervical carcinoma. Sagittal and axial T2-weighted MR images show that the cervix is almost entirely replaced by a slightly hyperintense mass. The tumor protrudes into the parametrium bilaterally ,however, it does not reach the pelvic wall. Hydrometra, which is caused by the obstructed internal cervical os, is also noted .



Cancer cervix invading the bladder

MRI - advanced cervix cancer invading the bladder



SUMMARY

- MRI is a multi-planer , Multi-sequences imaging modalities.
- Any ferrous or Magnetic object is contraindicated in MRI ***ROOM***
- ***MRI has the upper value of tissue nature differentiation.***
- ***MRI Has less value in detection of Calcification – Air***
- ***US is the 1ry method of Gynecological ex Abd or TV.***

- ***As Regarding Schemes of Diagnosis***

OVARIAN Cystic LESIONS

Simple

Benign

Atypical

INFLAMATORY

With Special Character

Bilateral ,Multiple , Small,

- ***Physiological***
- ***Polycystic***

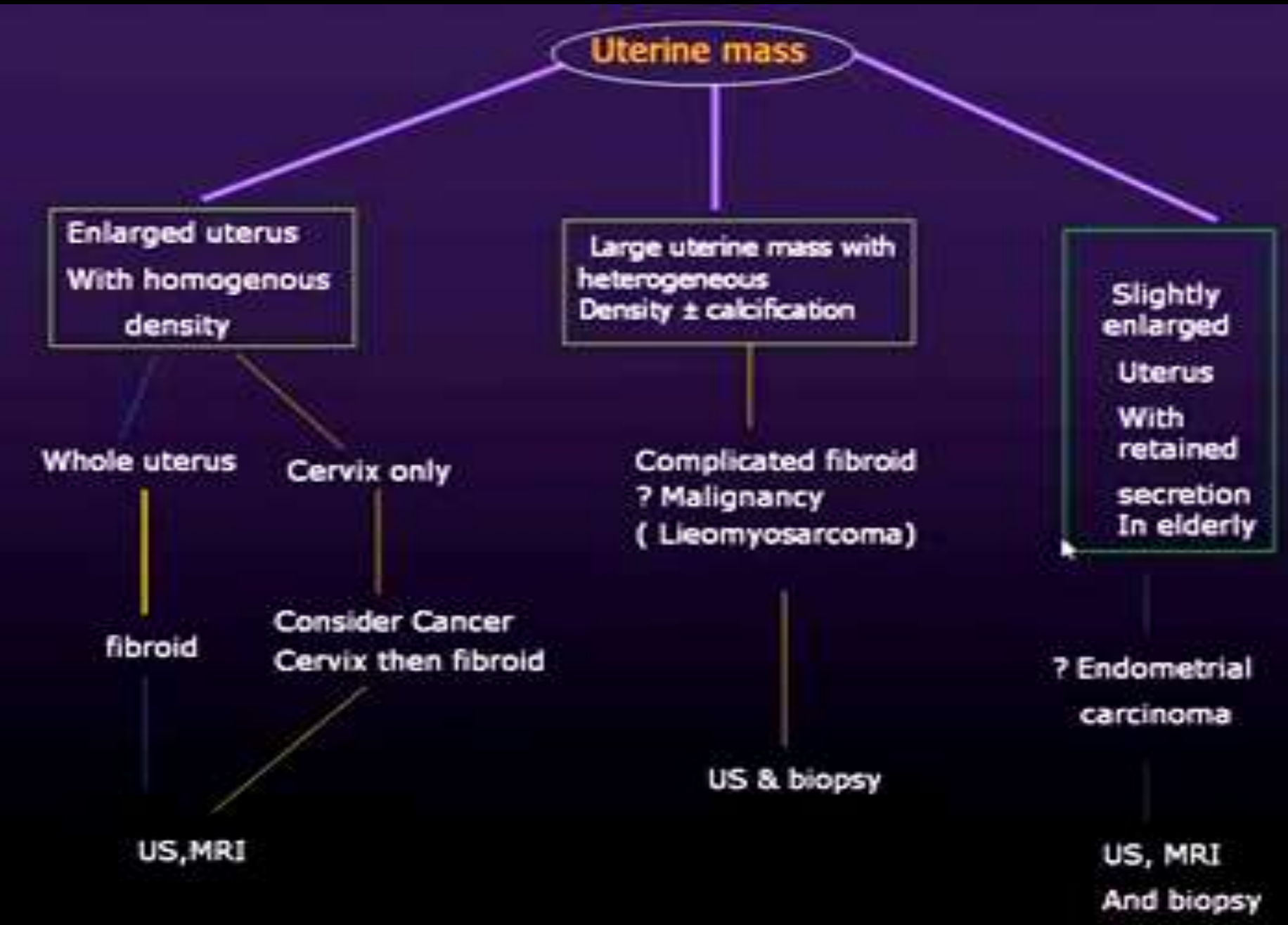
FAT+)-Ca

Dermoid

Hemorrhage

- ***Hage Cyst***
- Endometriosis


Ovarian mass
solid mass
Mixed cystic And solid
Consider malignancy
known primary
(breast , stomach)
No known primary
malignant ovarian tumor
Deposits


Uterine mass
Enlarged uterus
With homogenous
density
Large uterine mass with
heterogeneous
Density ± calcification
Slightly
enlarged
Uterus
With
retained
secretion
In elderly
Whole uterus
Cervix only
Complicated fibroid
? Malignancy
(Lieomyosarcoma)
fibroid
Consider Cancer
Cervix then fibroid
? Endometrial
carcinoma
US & biopsy
US,MRI
US, MRI
And biopsy

- ***Cervical Mass consider Malignant Until proved other wise.***

http://www.mediafire.com/download/623uflioapuko7q/MRI+And+CT+Of+The+Female+Pelvis.pdf

* Other Roles of MRI in Gynecological Imaging :

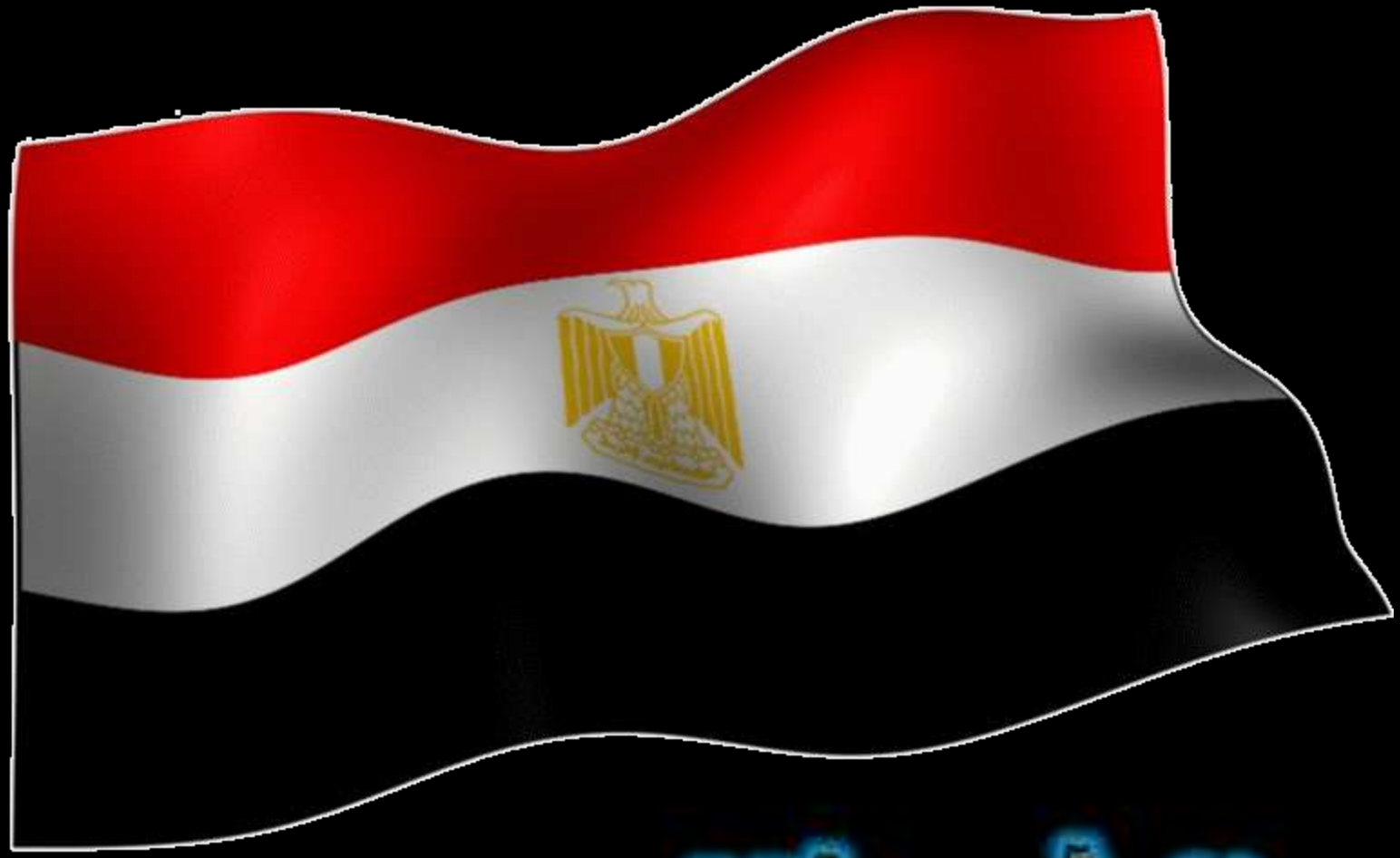
- **Functional MRI of the Pelvic Floor**
- **MR Pelvimetry**

for More Details ……. See "CT & MRI of female pelvis"

http://www.mediafire.com/download/623uflioapuko7q/MRI+And+CT+Of+The+Female+Pelvis.pdf

Sources:

- *http://www.radiologyassistant.nl/en/p4d85aa9a92bbb*
- *http://www.mediafire.com/download/623uflioapuko7q/MRI+And+CT+Of+The+Female+Pelvis.pdf*
- *http://www.youtube.com/watch?v=WrCFuE_mwzM*



Thank You