

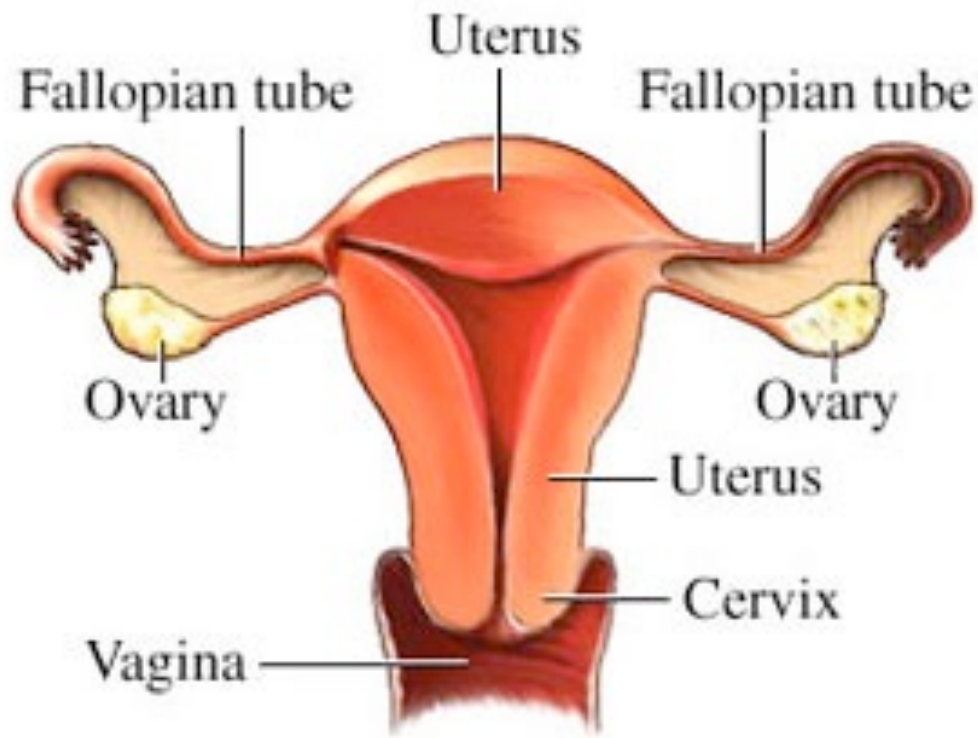


# 女性盆腔疾病的MR诊断

北京大学第一医院

王霄英

## Female Reproductive System



- MR检查技术
- 正常子宫的MR表现
- 子宫体病变
- 子宫颈病变



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# MR检查技术

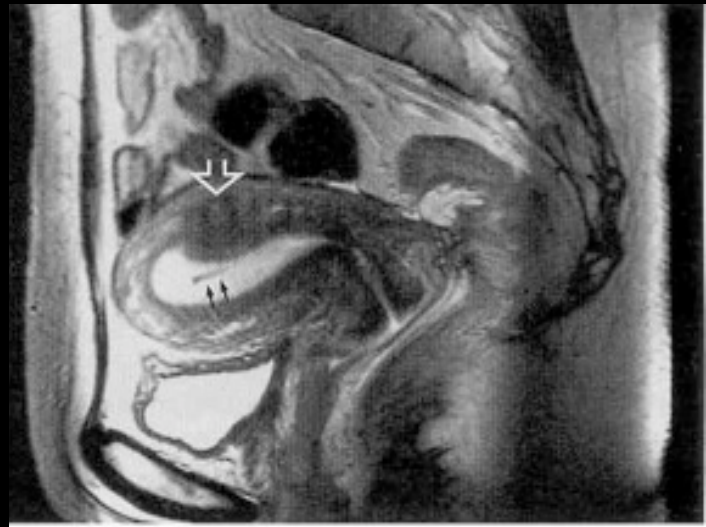
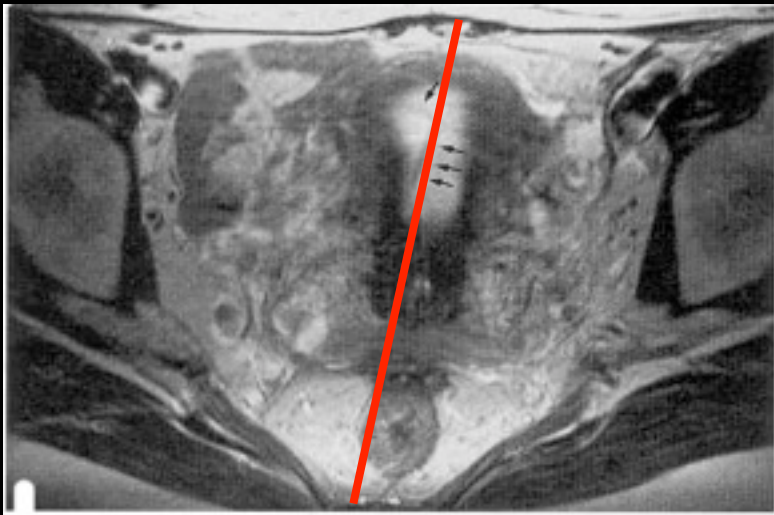
- 序列
  - 平扫
    - T2, T1
  - 动态增强
  - 新技术

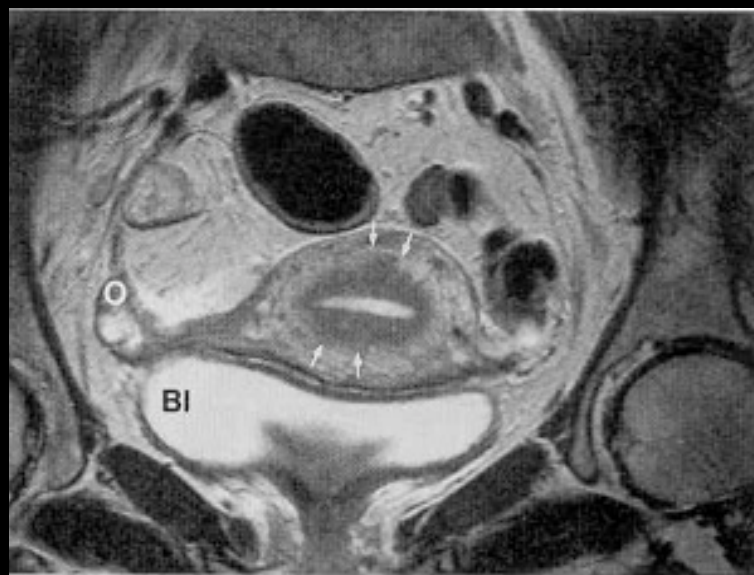
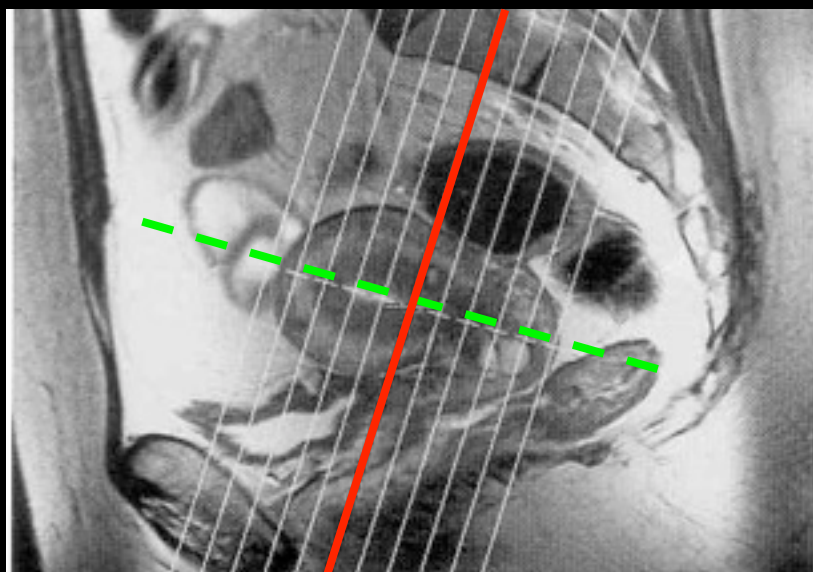


# MR检查技术

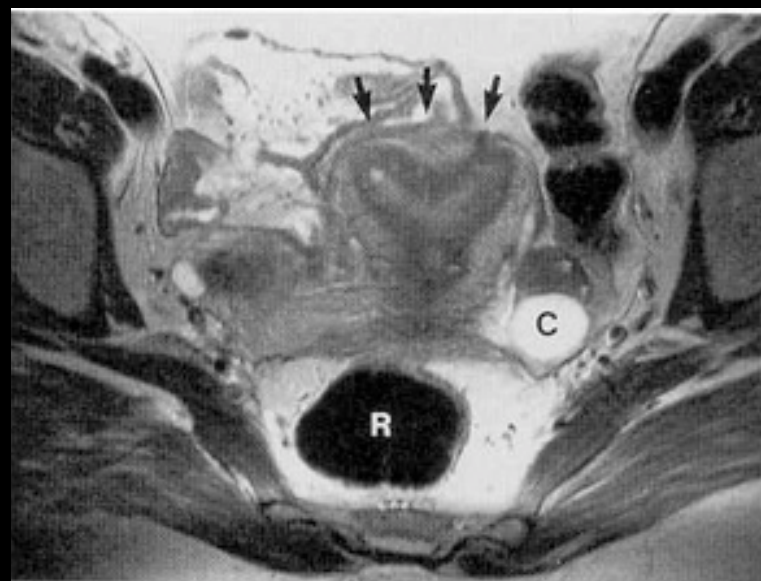
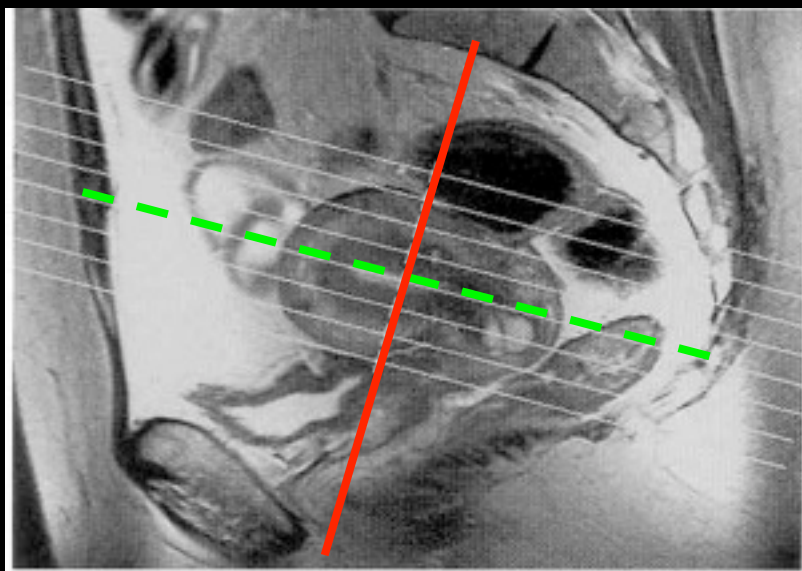
- 扫描定位
  - (斜) 矢状
  - 横断
  - (斜) 冠状
- 范围
  - 肿瘤分期
    - 局部+大范围
  - 良性病变
    - 局部，必要时大范围









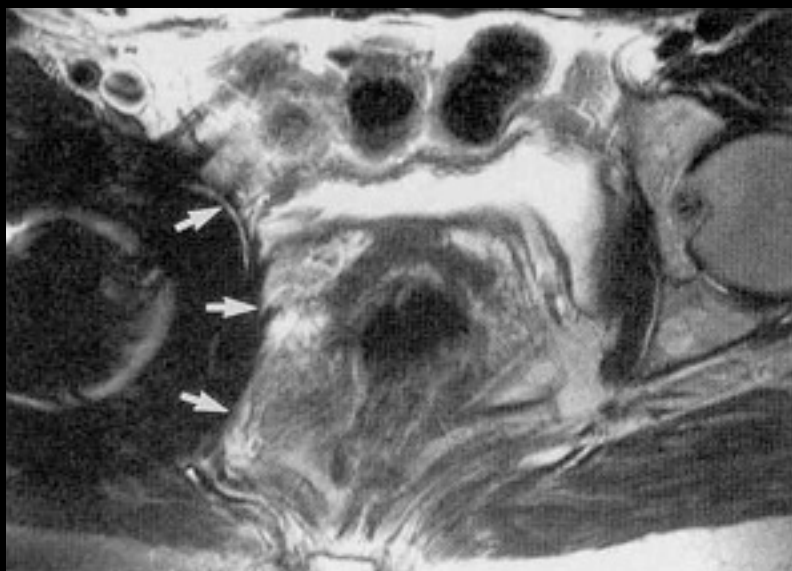


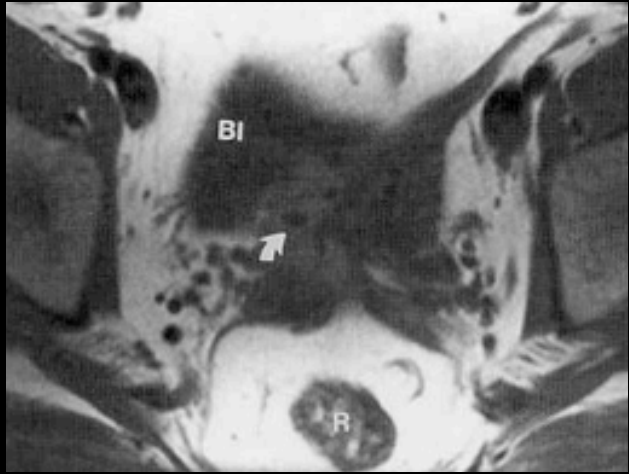
# MR检查技术

- 伪影
  - 运动伪影
    - 肠蠕动
    - 呼吸运动
  - 金属伪影





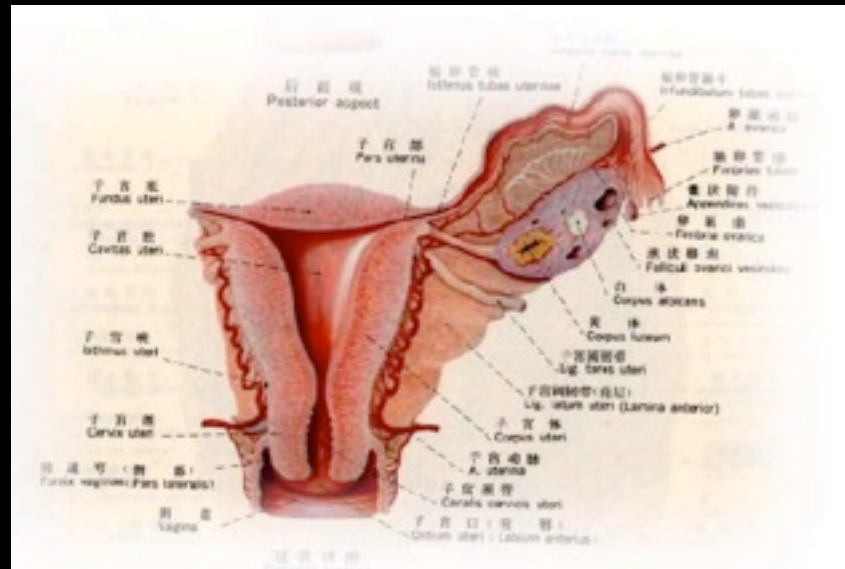




- MR检查技术
- 正常子宫的MR表现
- 子宫体病变
- 子宫颈病变

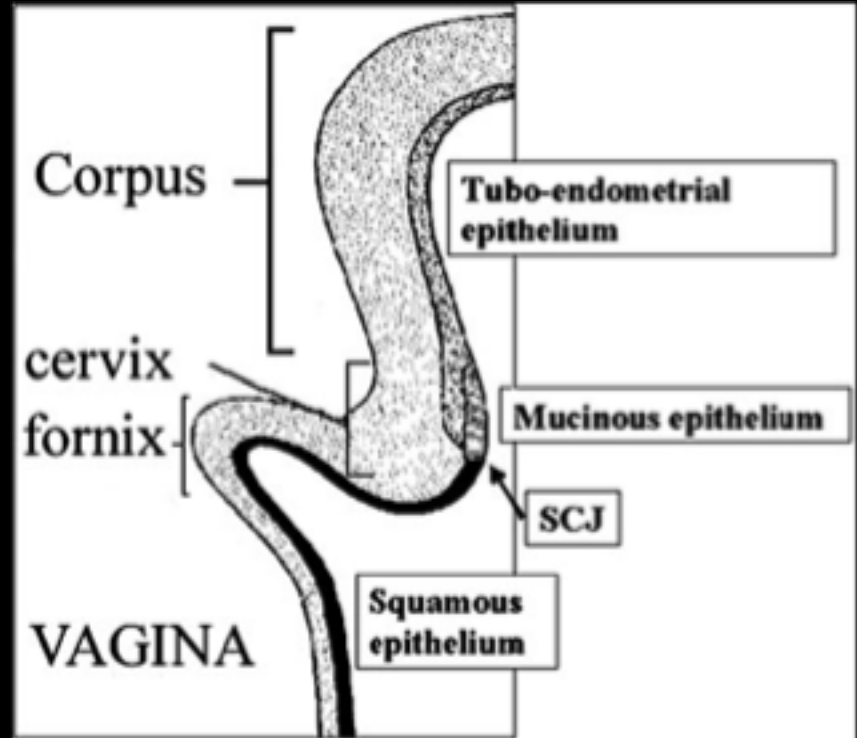


- 位于盆腔中部，膀胱与直肠之间
- 成人正常的子宫呈轻度前倾、前屈
- 子宫可分为底、体、峡、颈四部



# 宫体

- 浆膜层
  - 由腹膜组成
- 肌层
  - 主要由平滑肌构成
- 内膜
  - 内层 / 外层
- 内膜
  - 功能性粘膜
  - 基底层





# 宫颈

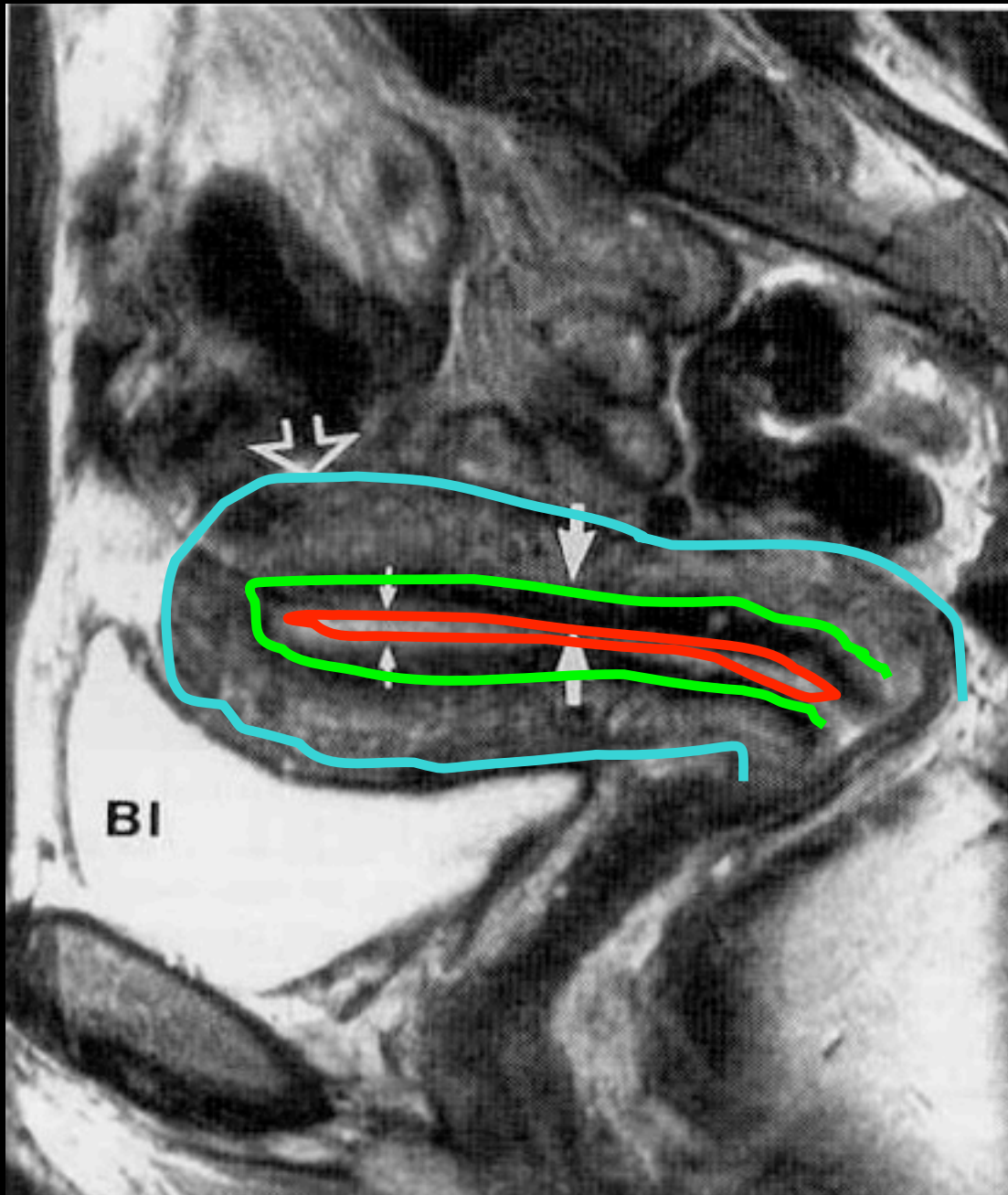
- 内膜
  - 柱状上皮组成，多粘膜皱襞
  - 纤维基质
    - 包绕宫颈内膜
- 最外层
  - 肌层

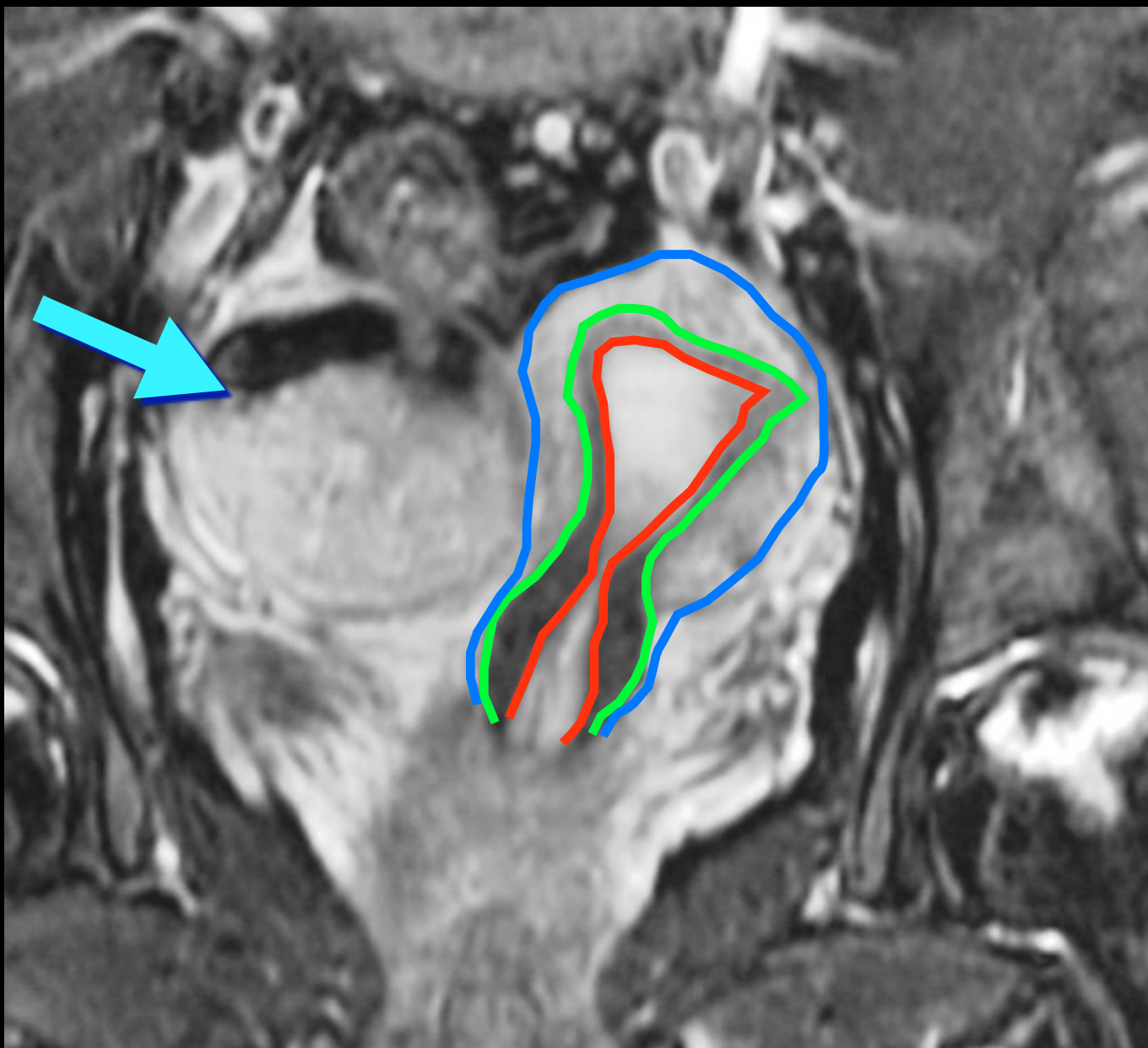


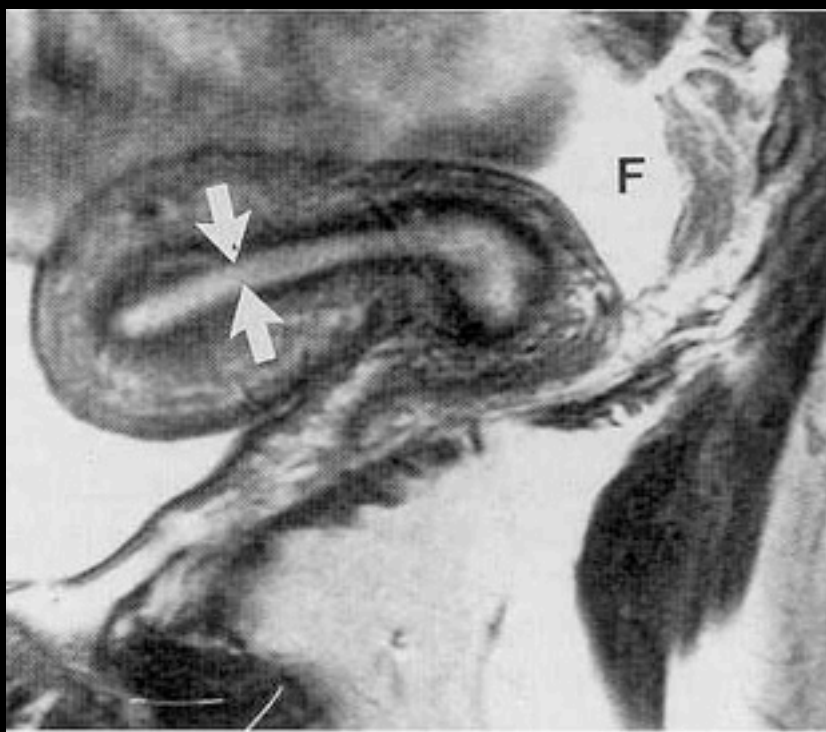
# MR表现

- 宫体： T2 W矢状位观察较好
- 生育期妇女分三层
  - 子宫内膜带
  - 结合带
  - 外肌层

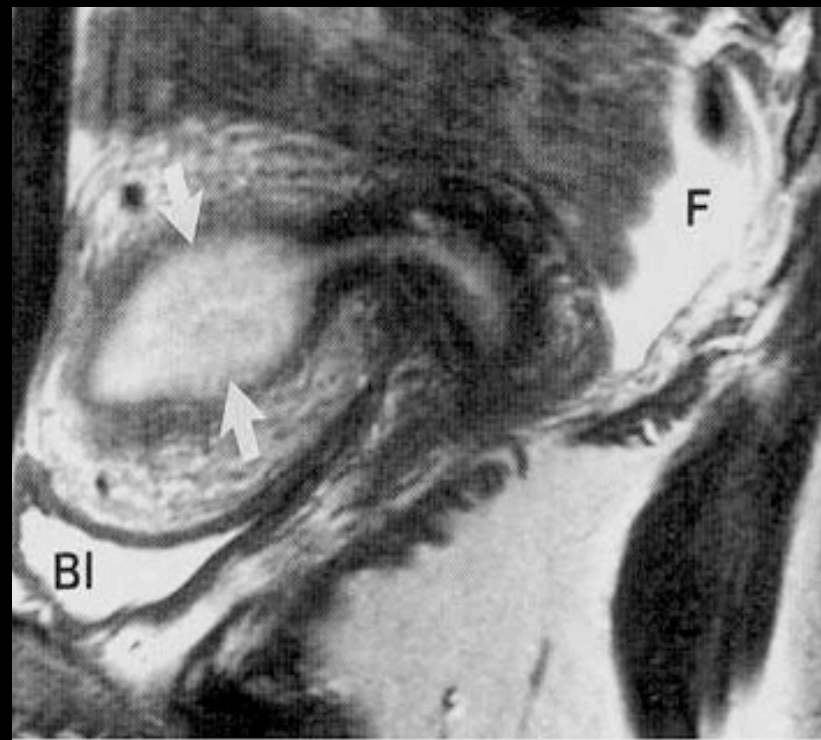






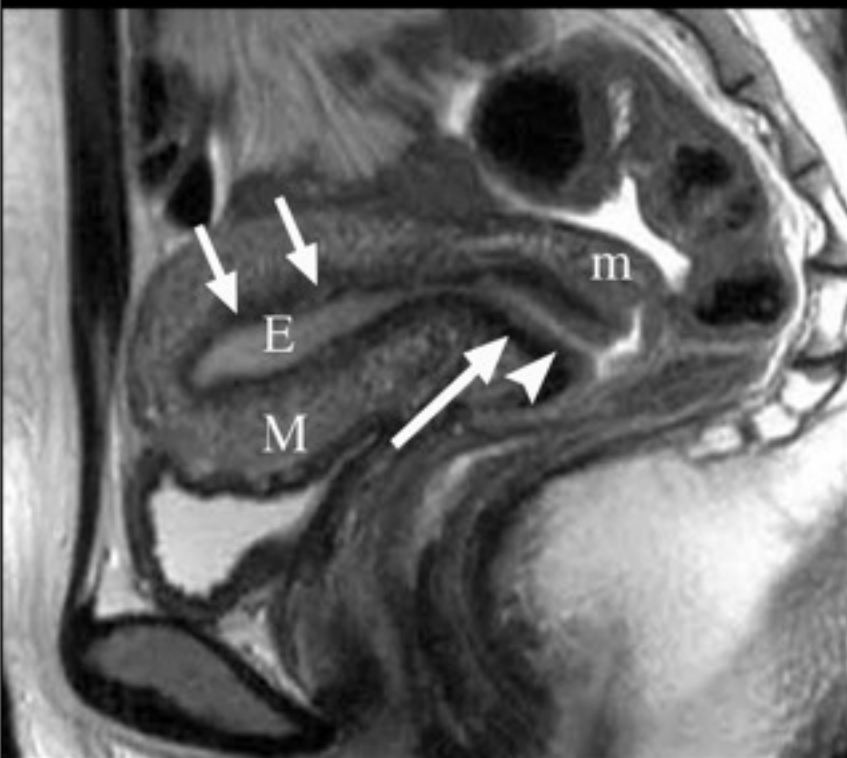


卵泡期（第6天）  
内膜薄

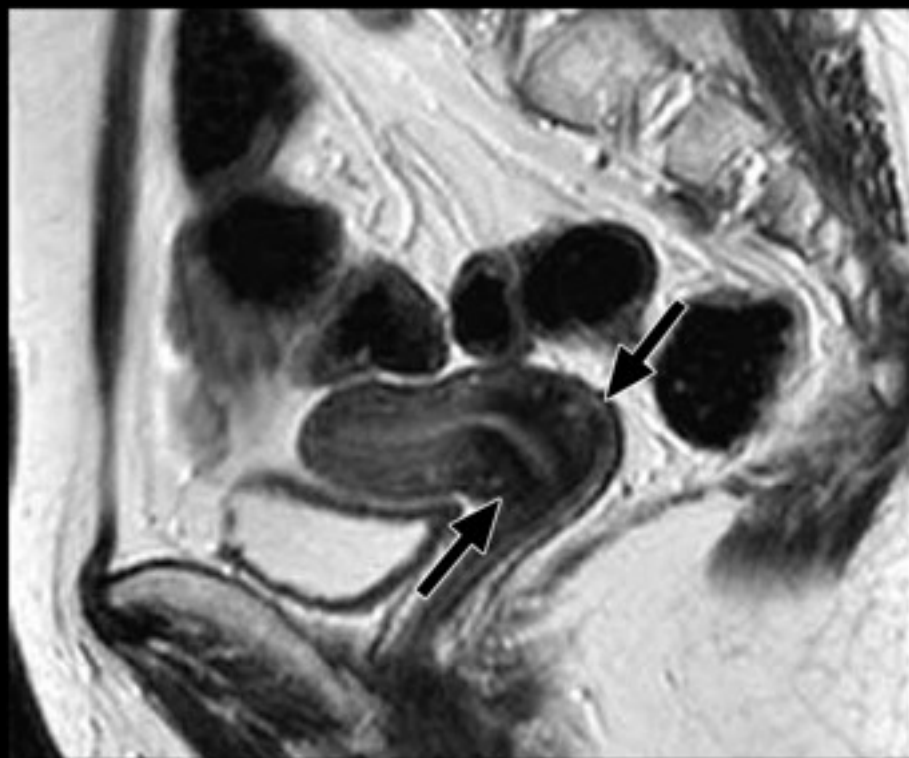


分泌期（24天）内  
膜增厚





育龄期



绝经后



# 动态增强扫描

- Gd-DTPA增强
  - 主要观察子宫内膜及肿瘤分期
- 动态扫描
  - 毛细血管期
  - 间质期



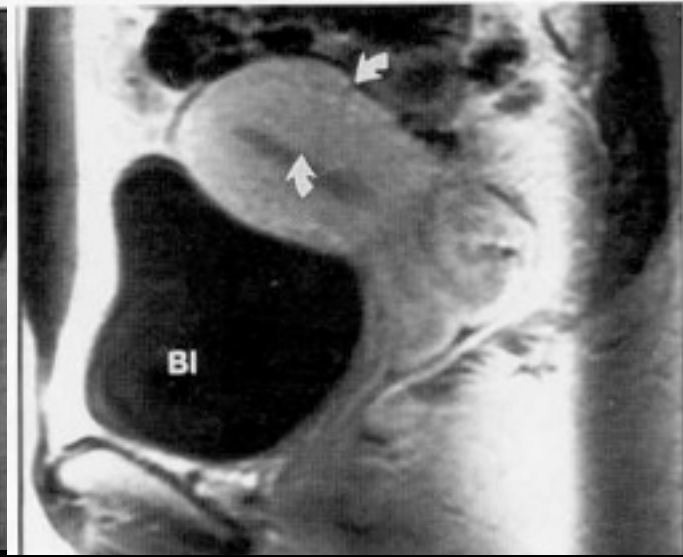
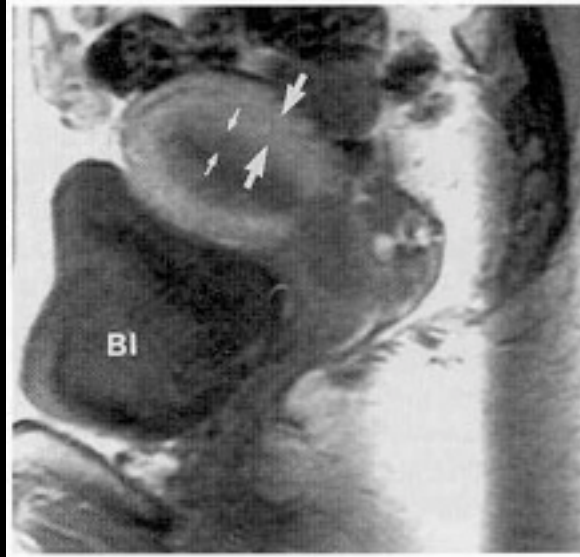
- 内膜
  - 早期强化不明显
  - 延迟期强化
- 肌层
  - 高峰强化发生120秒

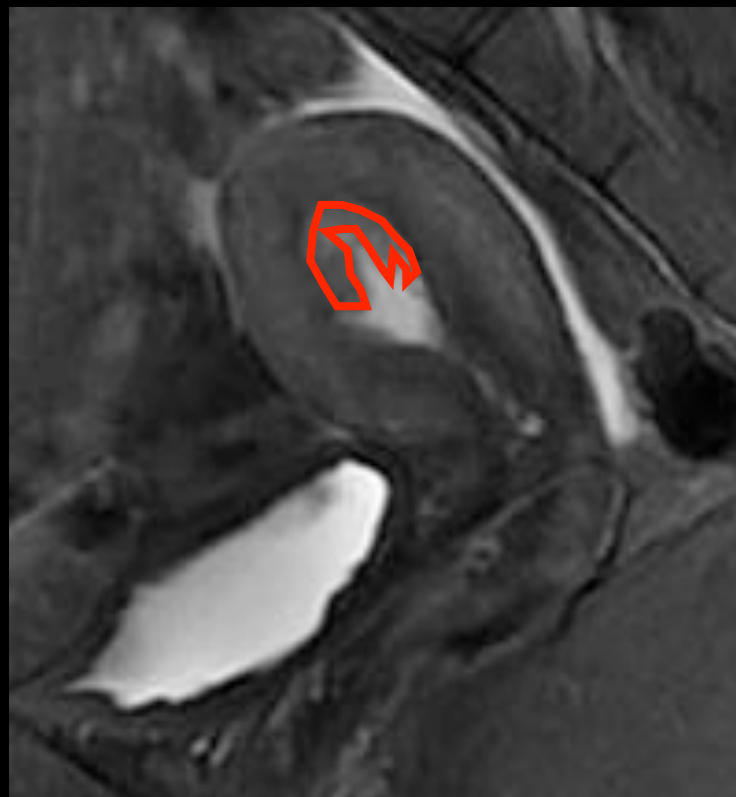




- 月经期
  - 动态扫描早期结合带强化
- 绝经期及增殖期
  - 内膜下薄层强化,随后肌层强化
- 分泌期
  - 动态扫描早期整个肌层强化,尤以外肌层明显.此类型强化尚可见于月经期和绝经后







- MR检查技术
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- 子宫颈病变



# MR Protocol of Uterus

Time	Pulse Sequence	Location	Resolution	Observations
4min	Sagittal T2WI without fatsat	Uterus	high	structure and signal
4min	Axial T2WI without fatsat	Uterus and pelvis		structure and signal
4min	Coronal T2 without fatsat	Uterus		congenital abnormalities and lymph node
2min	Sagittal T1WI	Uterus		high signal in structure
8min	DCE	Uterus and pelvis	high	vasculature and blood supple; tumor invasion

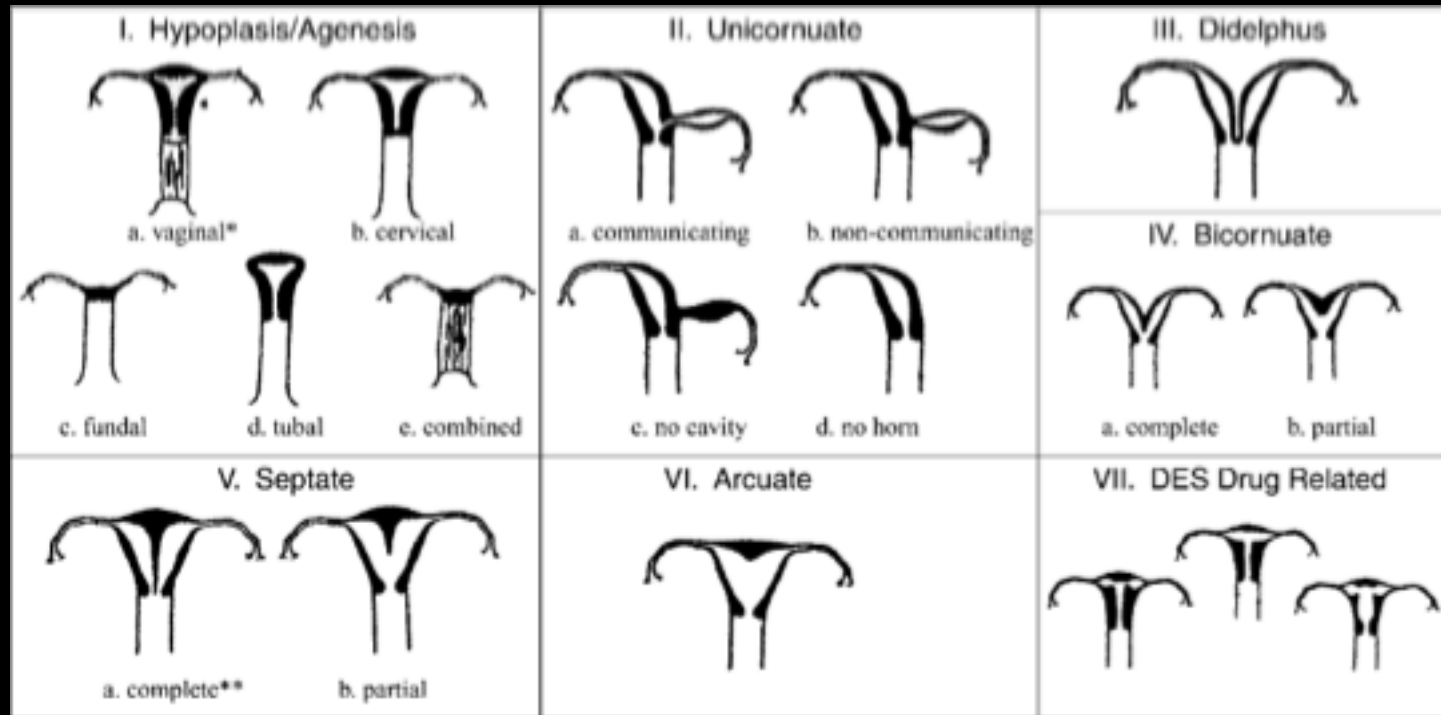


# 先天性畸形

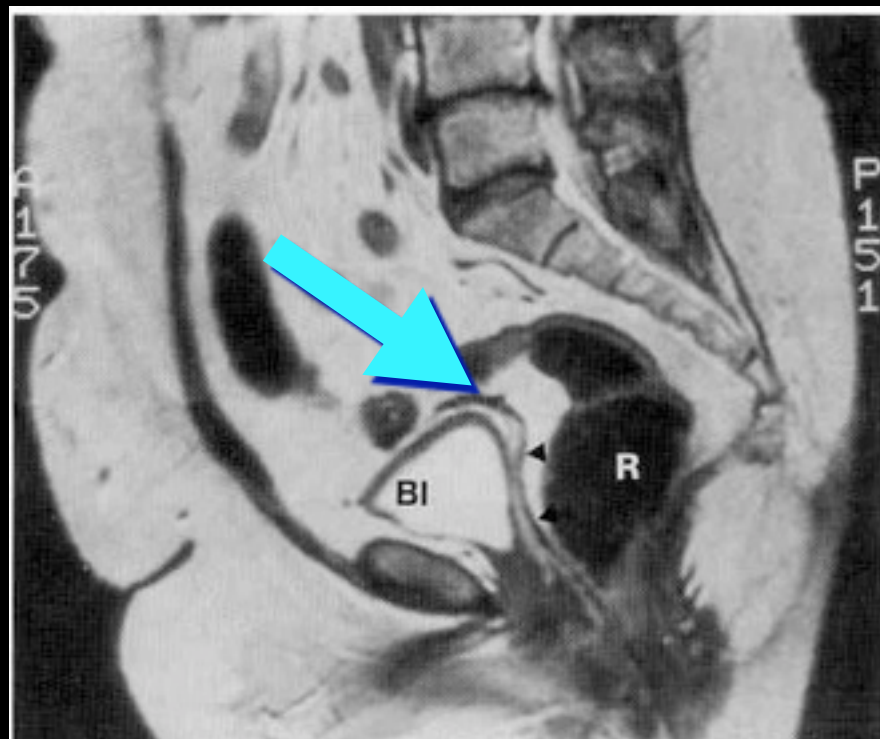
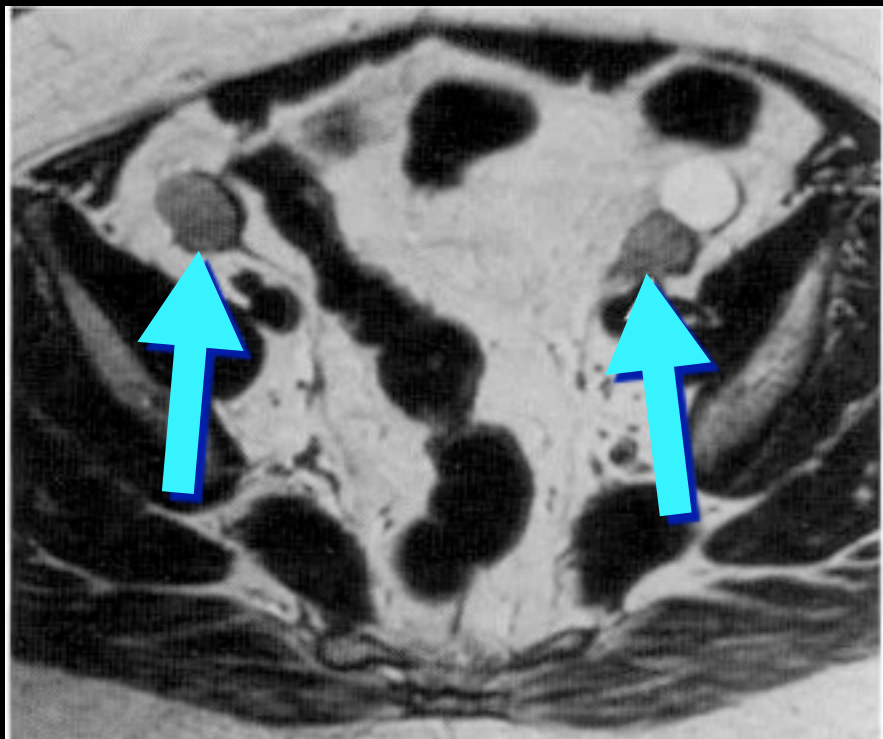
- 约占0.1-0.5%
- 分两类
  - 子宫或阴道闭锁或发育不全
  - Mullerian管闭合不全



# Mullerian管发育畸形



# 两性畸形





# 双子宫

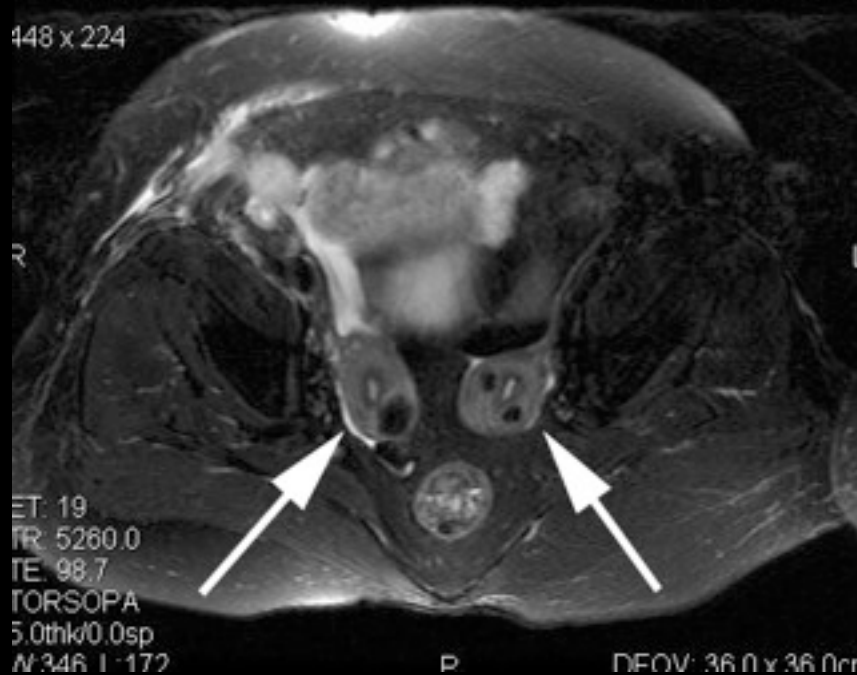
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Acq Tm: 10:19:2 : 144.7 (COI)

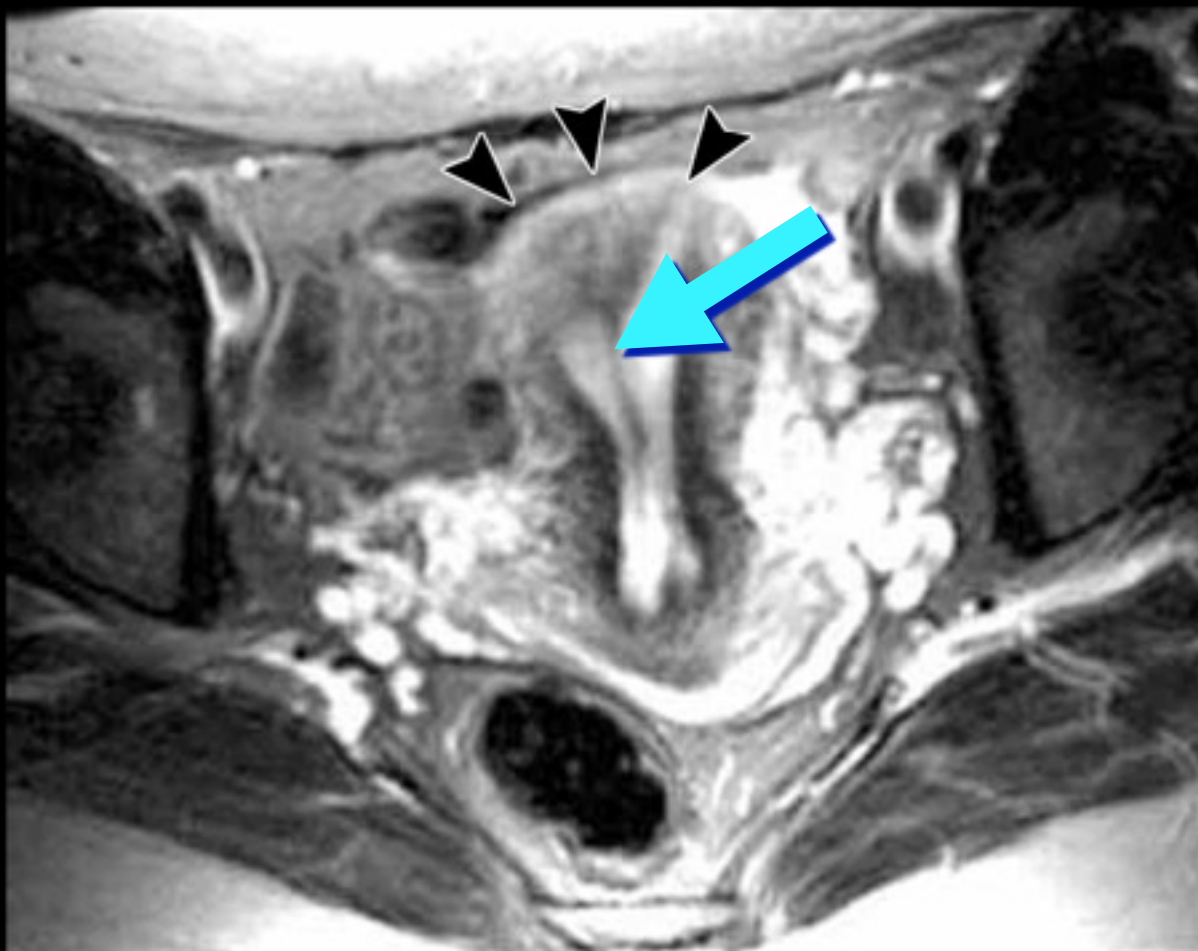
Acq Im: 10:19:2

448 x 224

448 x 224



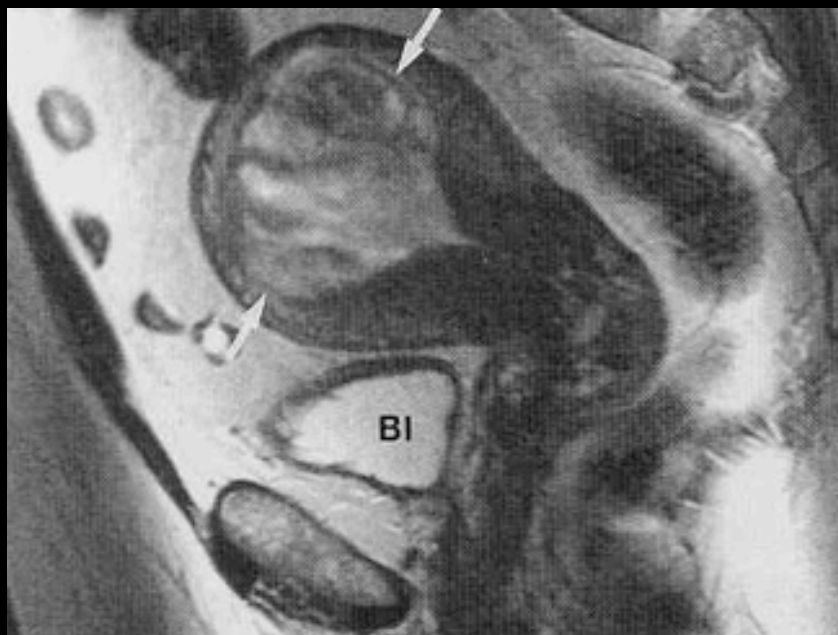
# 纵隔子宫



# 子宫内膜增生

- 绝经后妇女子宫内膜增厚
  - 激素替代 $\leq 8\text{mm}$
  - 无激素替代 $\leq 5\text{mm}$

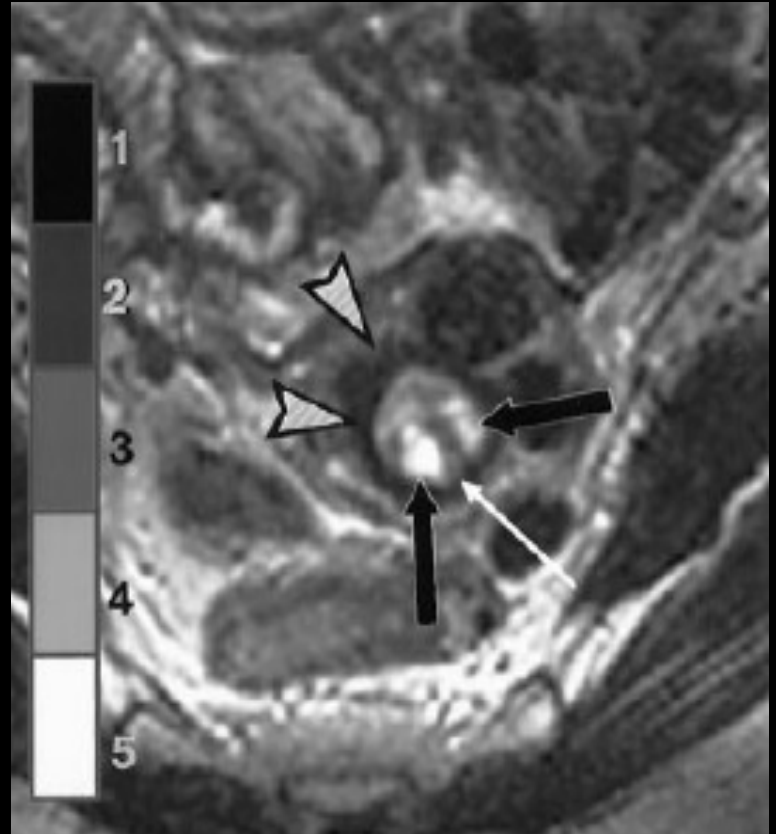


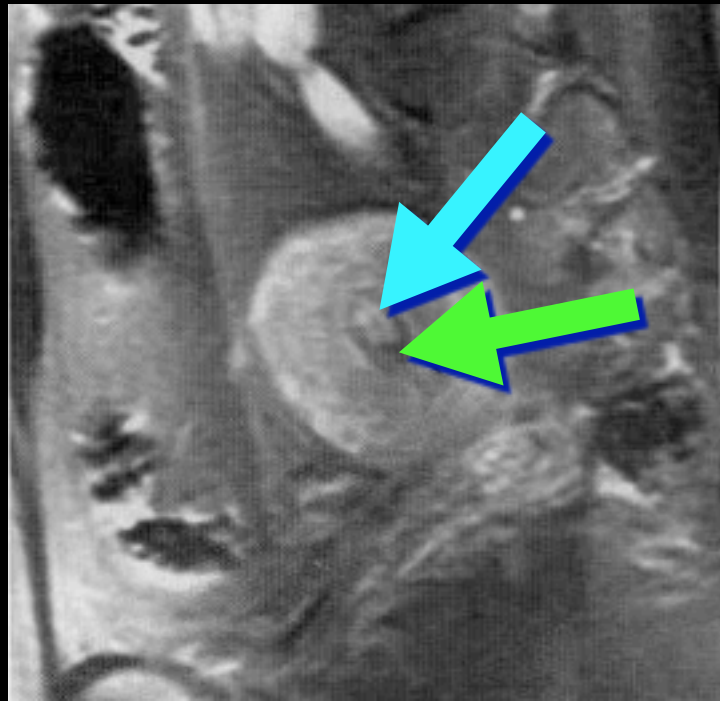
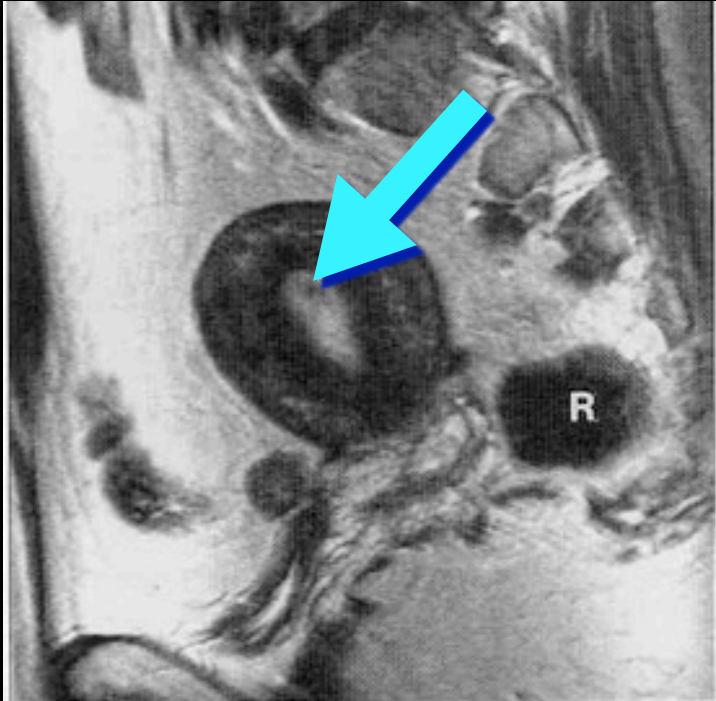


# 子宫内膜息肉

- 内膜带局部或弥漫性增厚
- 结合带完整
- 息肉蒂:线状低信号
- T2WI: 囊肿及纤维成分
- CE MR: 对鉴别诊断帮助不大, 坏死提示内膜癌







# 子宫肌瘤

- 最常见子宫肿瘤,35岁以上妇女,发生率20%;具有雌激素依赖性,绝经后退化
- 病理特点
  - 肿瘤内平滑肌细胞呈旋涡状排列
  - 周围借假包膜和子宫肌相隔
  - 多数平滑肌瘤有一定程度的变性
- 分类
  - 粘膜下
  - 壁内
  - 浆膜下
  - 宫颈内





- T2W

- 边界清楚锐利的低信号肿块
- 有时壁内或浆膜下平滑肌瘤周围可见一高信号环,可能为扩张的淋巴管,静脉或水肿.
- 直径3 – 5cm者,信号不均匀,高信号系变性所致,除出血外,精确判断各类变性很困难.大平滑肌瘤偶可见广泛周边囊性变.

- 增强

- 动态扫描及延迟扫描:大多数表现为边界清楚强化程度较周围肌低.
- 平滑肌瘤的大部分呈不均匀强化



LI XIN  
P51.2  
DFOV 36.0 cm

S 210

Nov 03 2003

Ex: 4425

Se: 105

Im: 15

R 110.7mm

P 45.9mm

I 131.0mm

26

R  
A

L  
P

rank = 2 / 16  
time = 0 sec

I 150

auto W = 189 L = 102



1.5T GEMRTWIN  
Ex: 3675  
SC:O-Sag T2 frFSE  
Se: 102/1  
Im: 9/11  
Sag: L16.0 (COI)

320 x 256

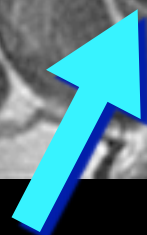
3 Peking University First hospital  
GAO JIAN XIN  
049Y M 64274  
Acc:  
2003 Sep 21  
Acq Tm: 09:55:19

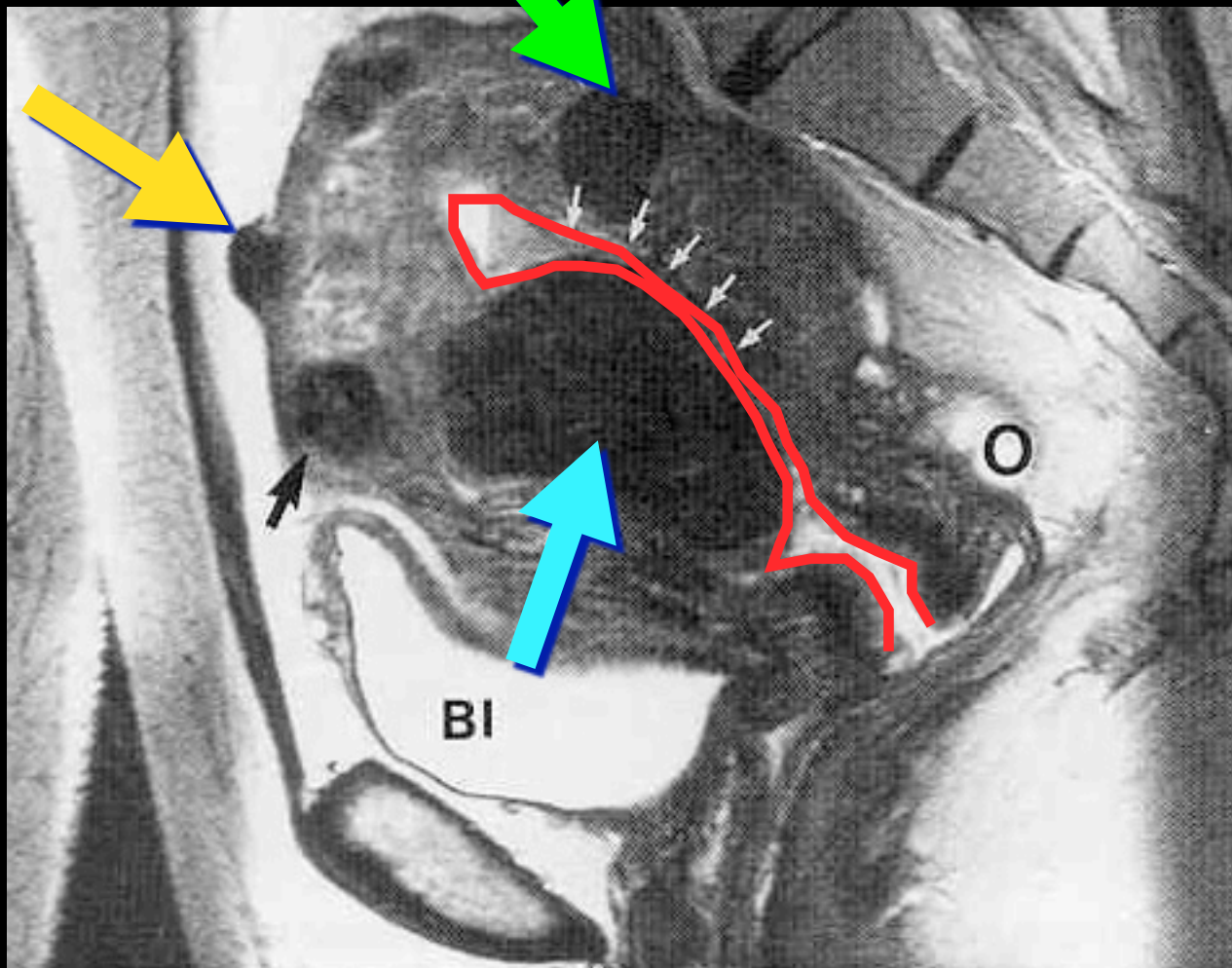
A

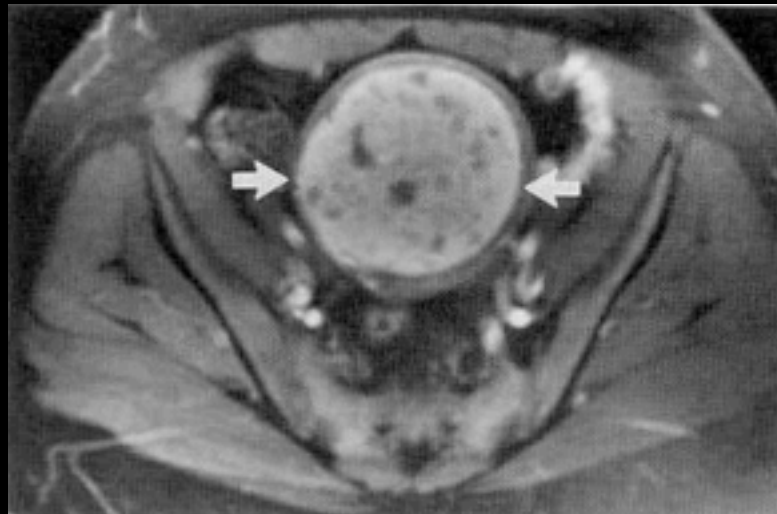
P

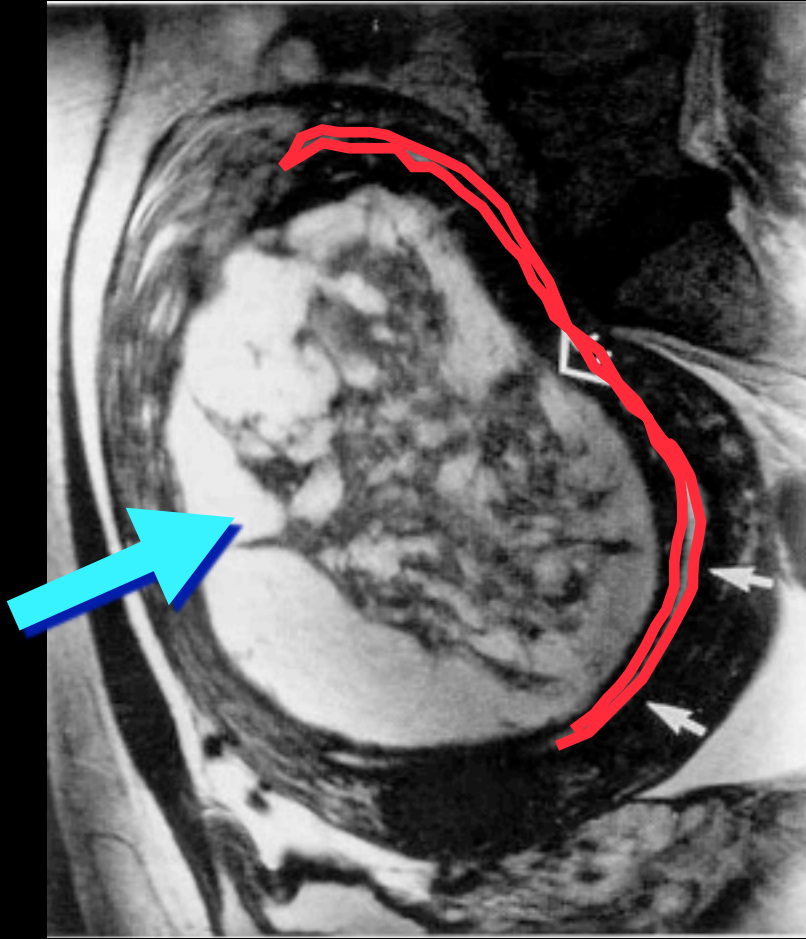
ET: 23  
TR: 3000.0  
TE: 101.1  
USLS456  
4.0thk/1.0sp  
W:641 L:262

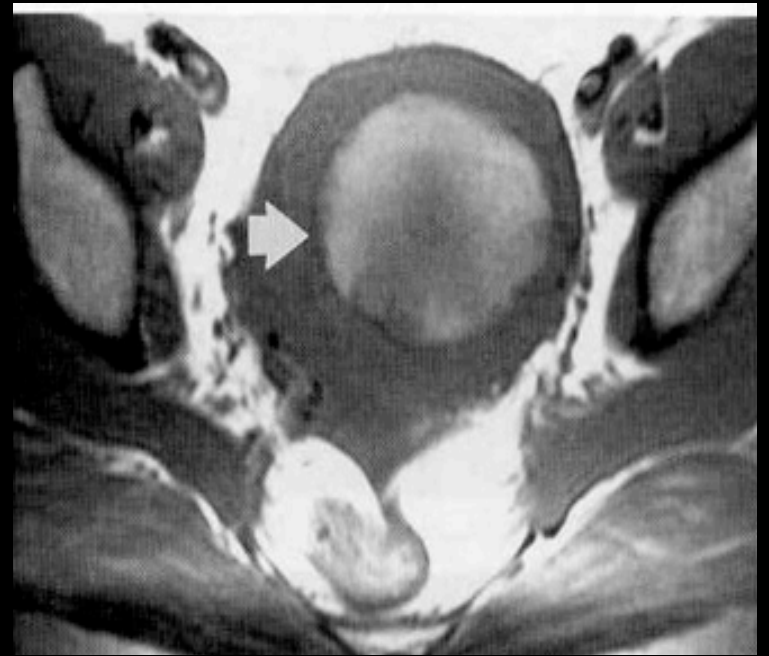
DFOV: 28.0 x 28.0cm











# 腺肌症

- 流行病学
  - 发生率约15-27%，40岁左右，经产妇
- 病理
  - 肌层内存在异位的内膜或基质，常侵及肌层达1/3以上
- 临床表现
  - 月经量过多、痛经、贫血、月经紊乱、子宫增大





- T2W

- 邻近子宫内膜低信号病变,结合带局灶性 / 弥漫性增厚。结合带 $\geq 12\text{mm}$ ,高度支持腺肌症; 结合带 $\leq 8\text{mm}$ ,可排除此病

- 边界不清楚,边缘不规则

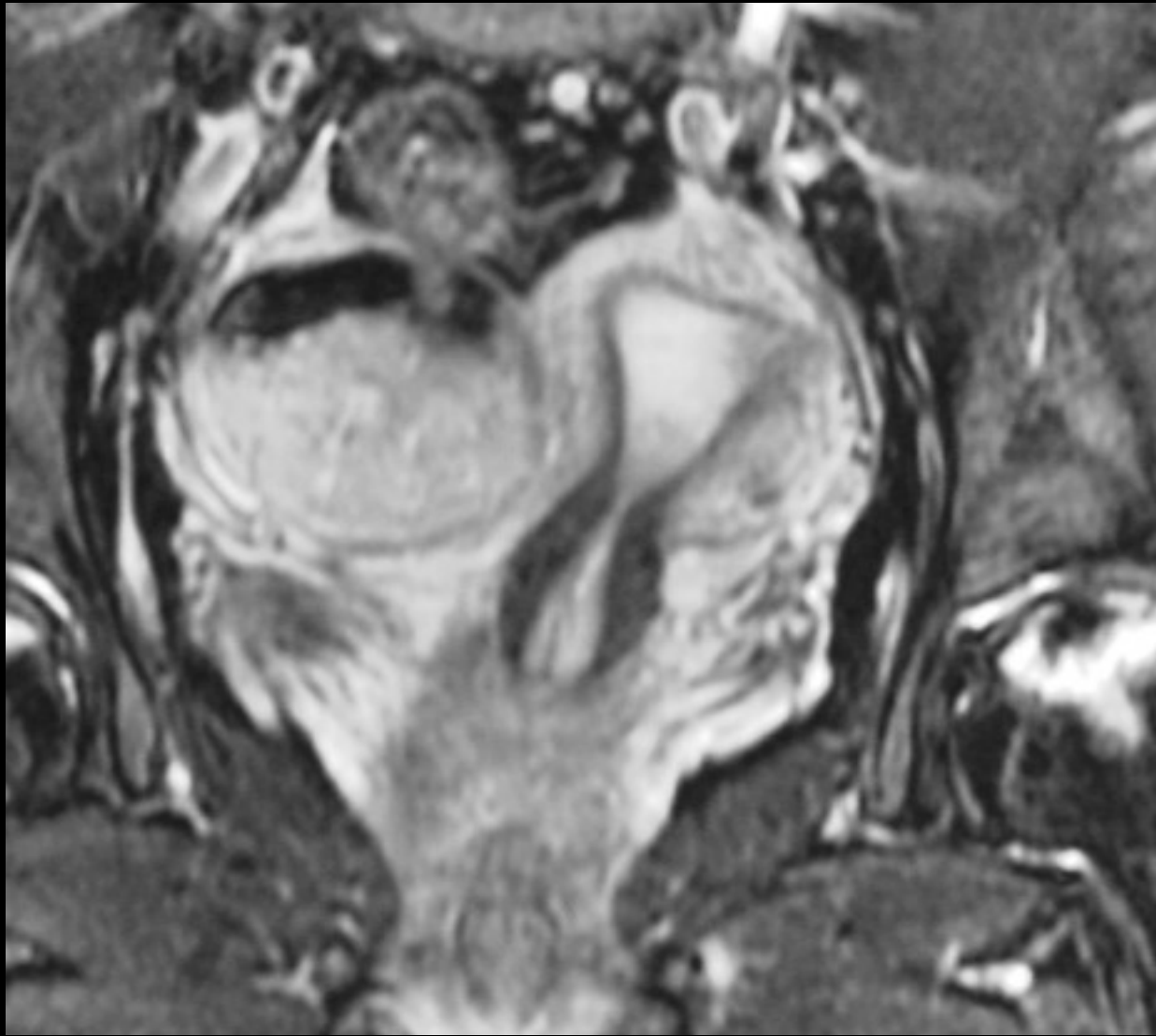
- 内膜向肌层内可见放射线状高信号

- T1W

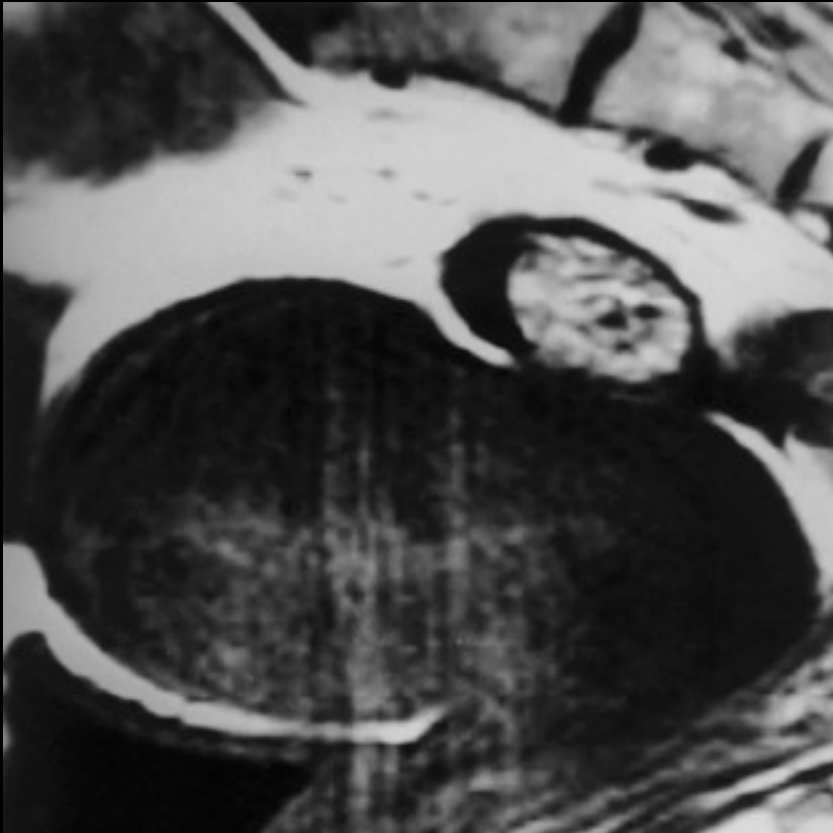
- 20%可见小高信号区(出血)

- 增强检查意义不大





# 弥漫型



# 局灶型



卵泡期



分泌期



L 0.5  
32.0cm



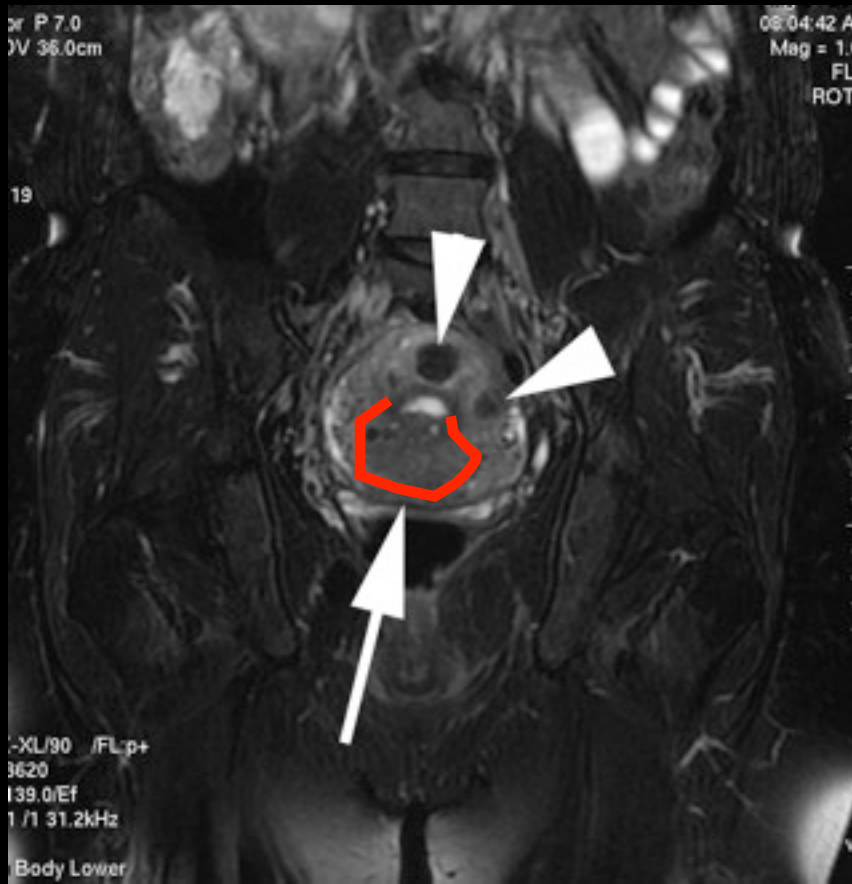
Aug :  
08:01  
Mag

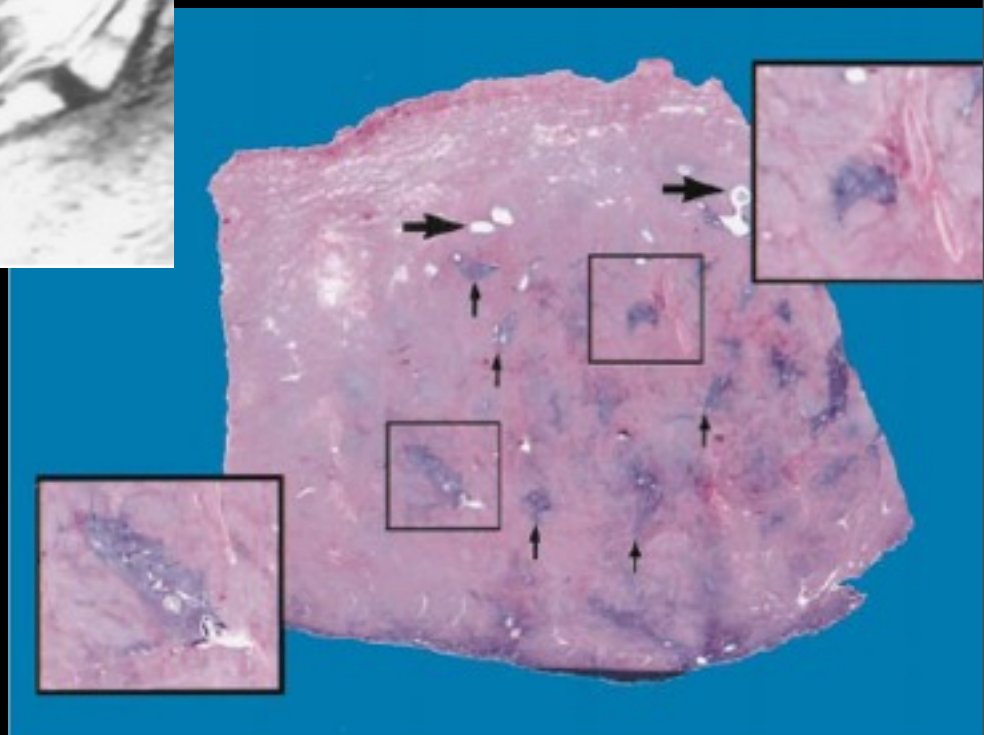
pr P 7.0  
JV 36.0cm

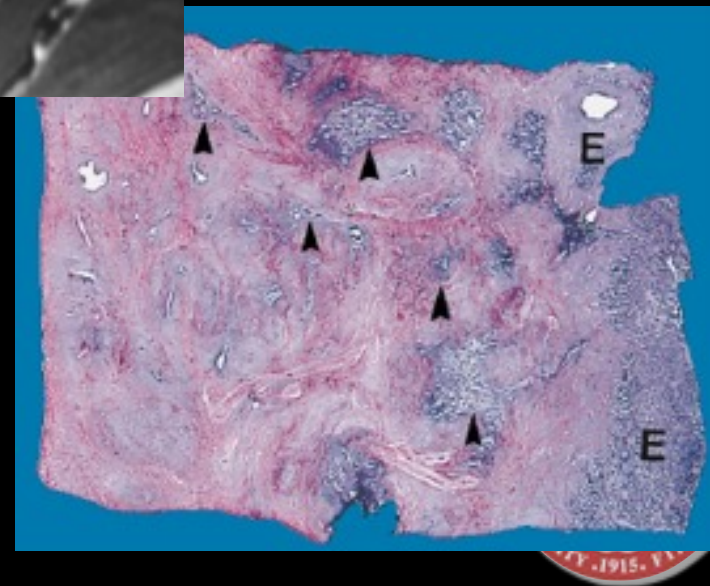
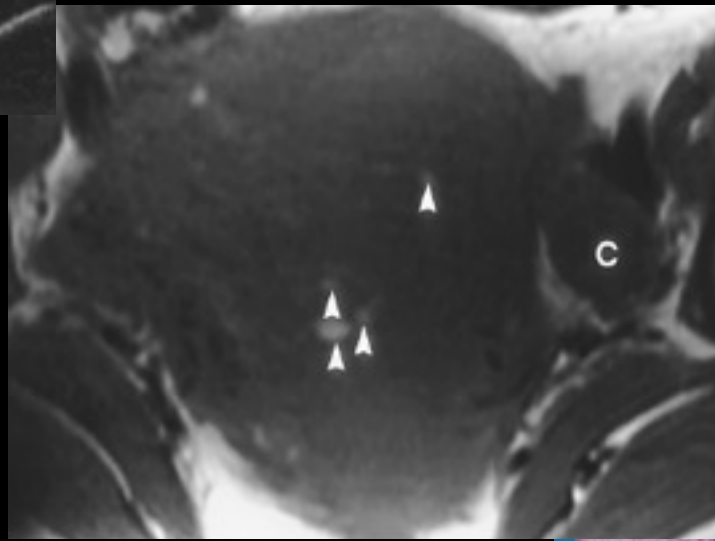
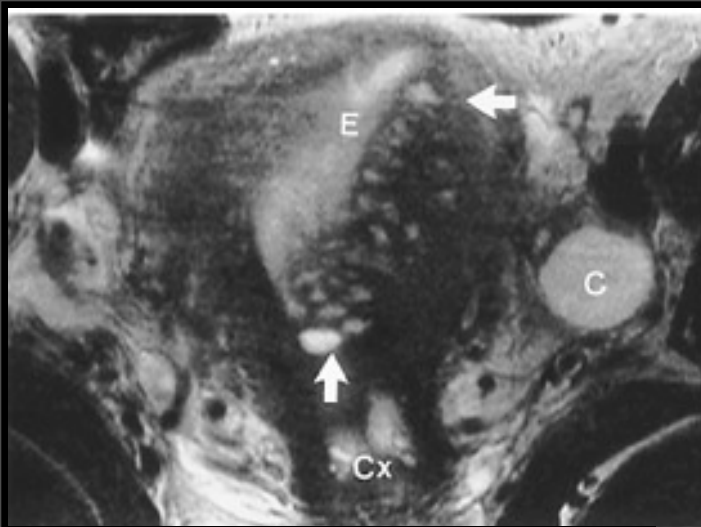
08:04:42 A  
Mag = 1.4  
FL  
ROT

19

:-XL/90 /FL:p+  
3620  
139.0/Ef  
1 /1 31.2kHz  
Body Lower







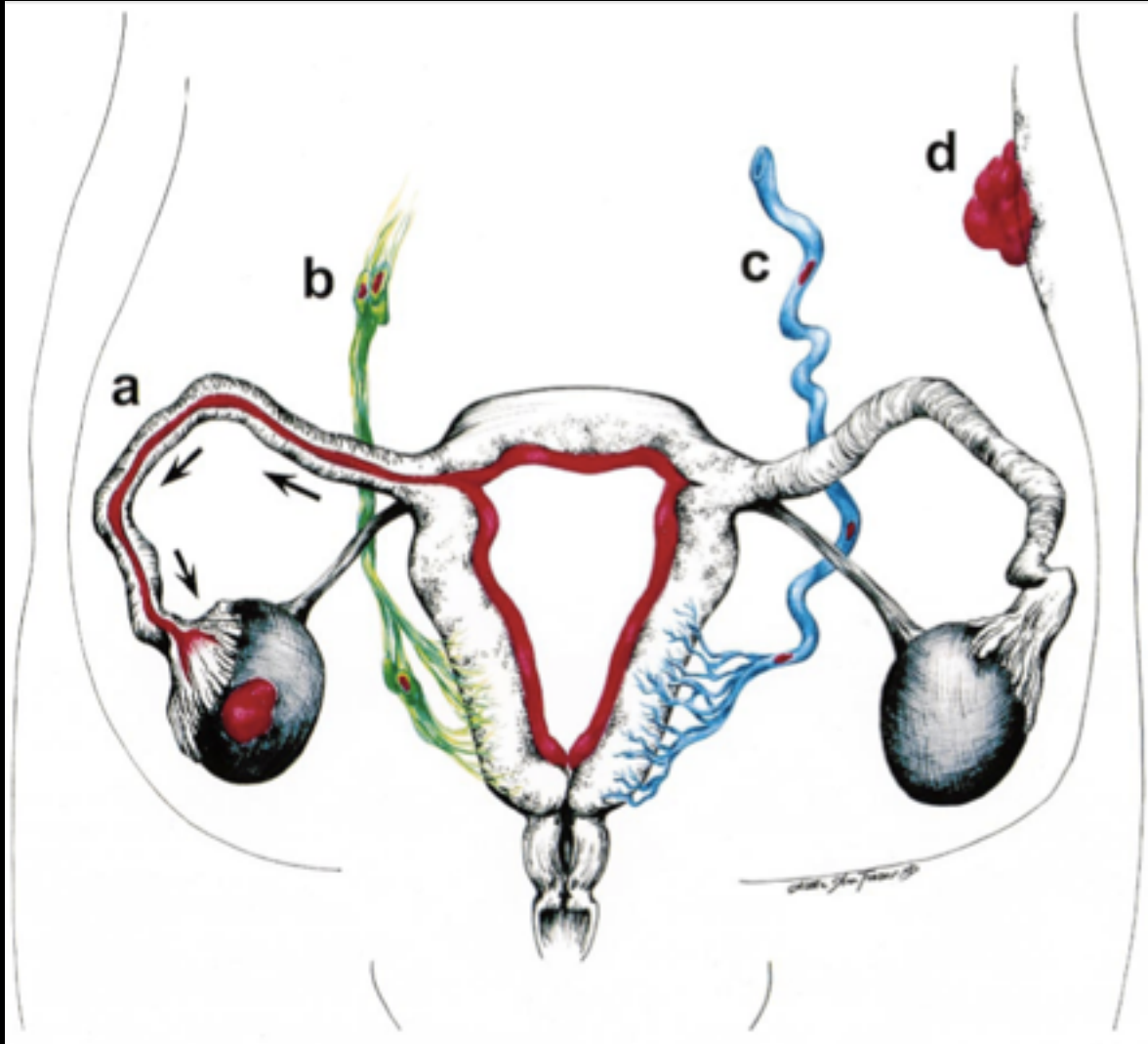
# 子宫内膜异位

- 50%为双侧，单纯囊性或实性，1%为恶性
- 周期性腹痛或盆腔痛，30-40%不育
- MR：典型不均匀性出血囊肿，实性为T2中等信号，边界欠清





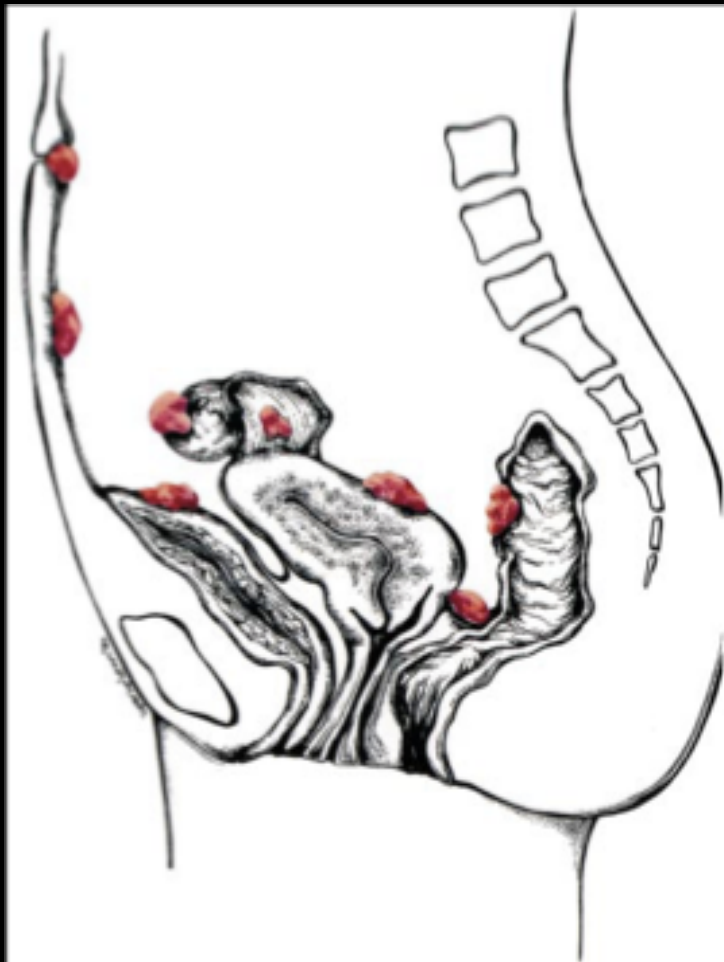
# 内膜异位途径



- A 月经
- B 淋巴
- C 血行
- D 化生

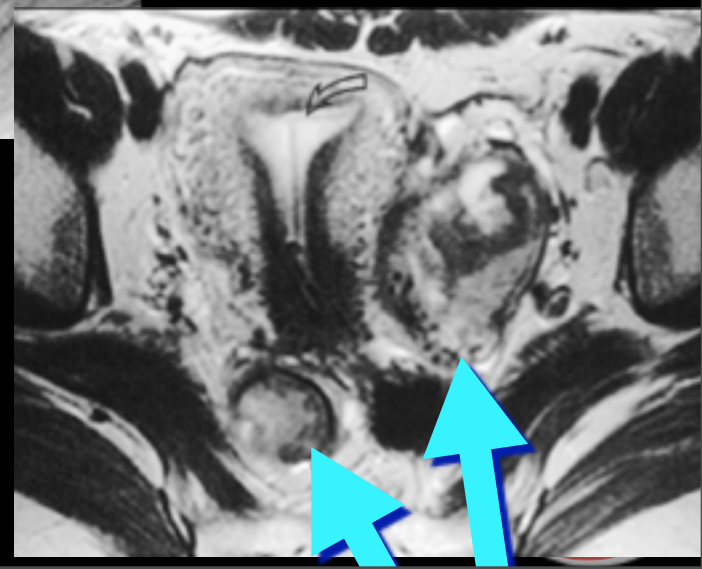
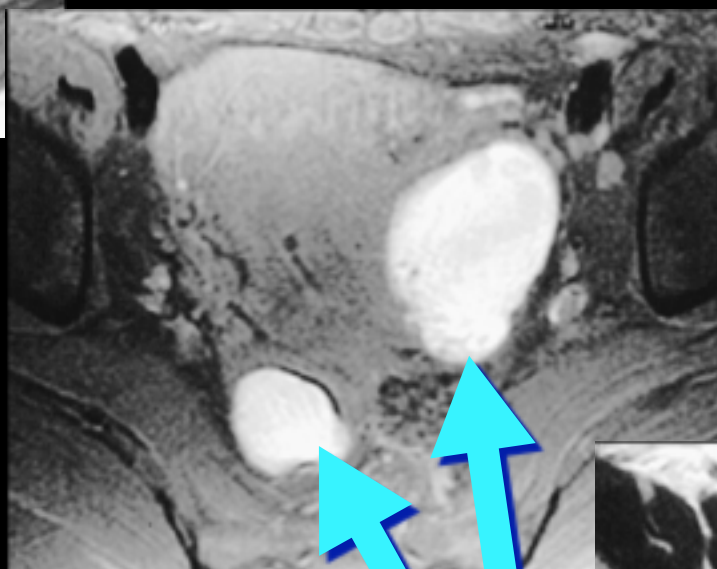
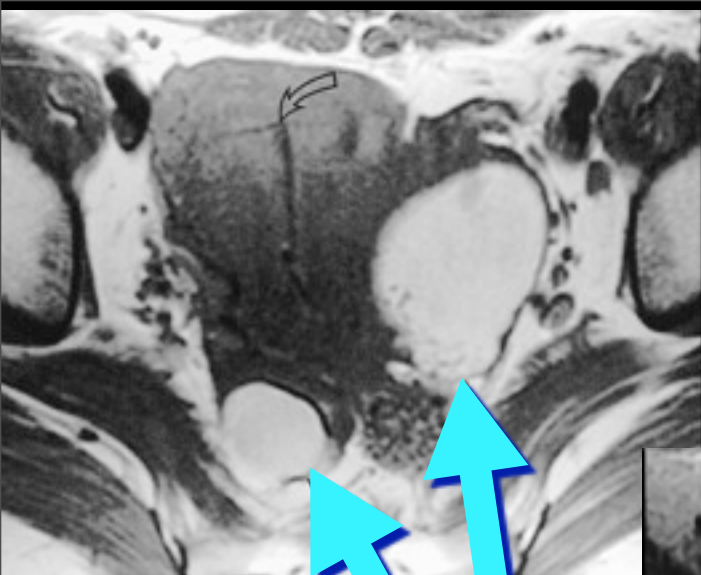


# 内膜异位常见部位



- 卵巢
- 道格拉斯窝
- 阔韧带后缘
- 宫骶韧带
- 子宫
- 输卵管
- 乙状结肠
- 输尿管
- 小肠

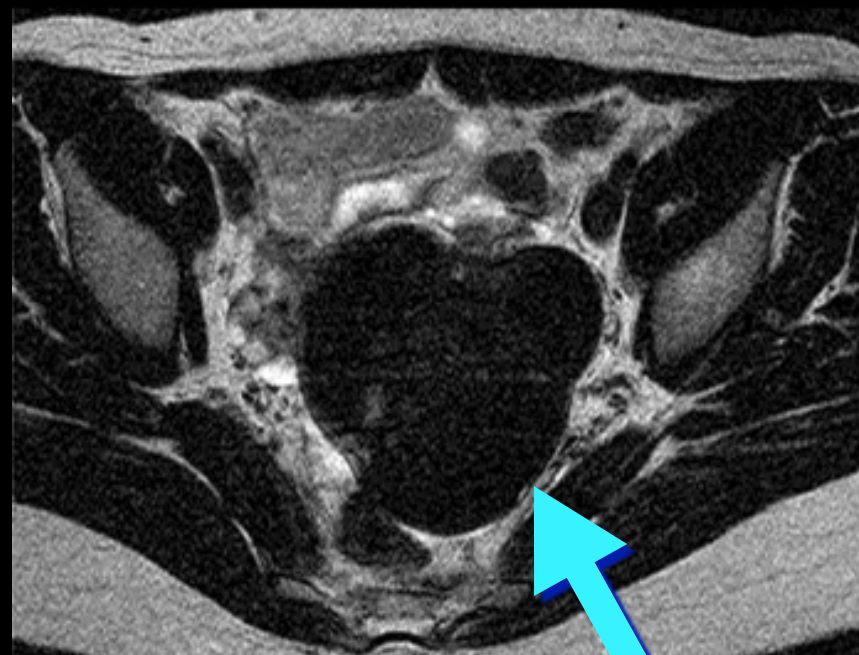




11年5月22日星期日



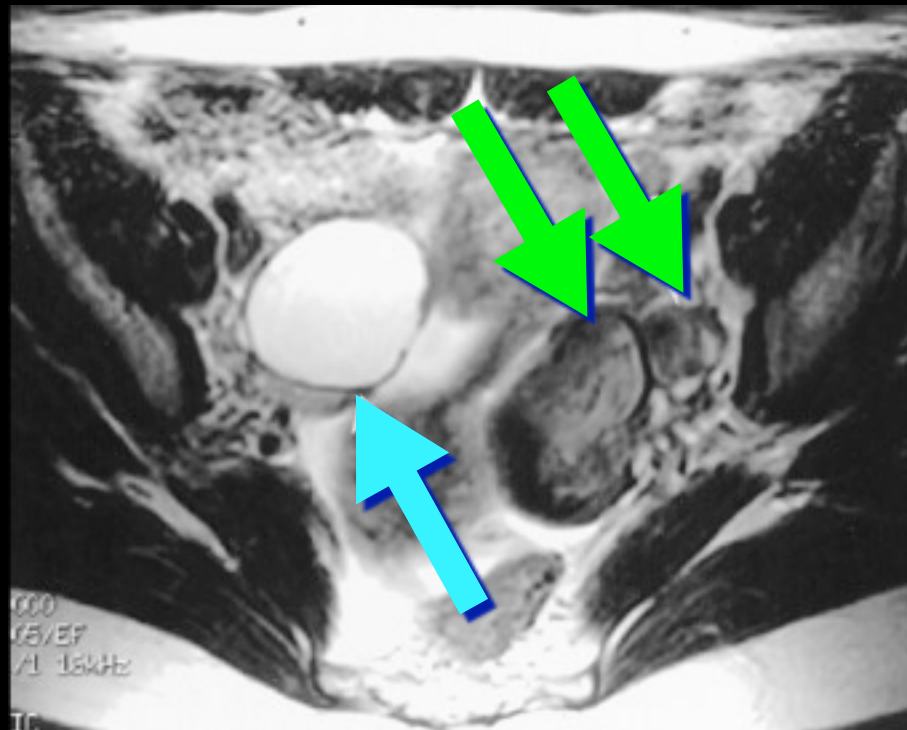
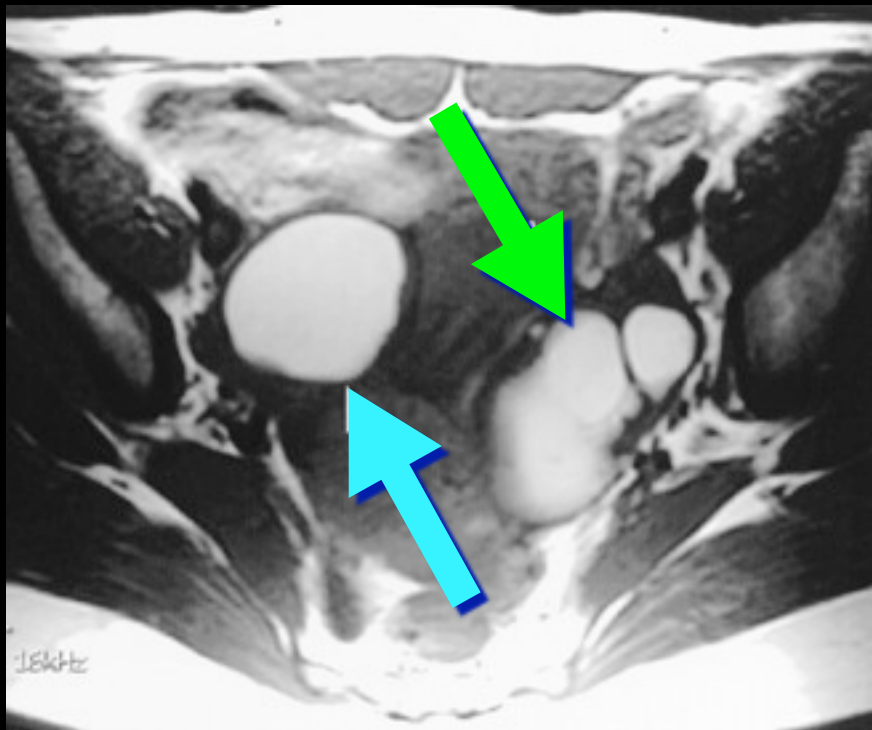
T1WI



T2WI



TIWI



T2WI



DONG HUI JUN  
I43.7  
DFOV 24.0 cm

A 95

Oct 23 2003

Ex: 4228

Se: 104

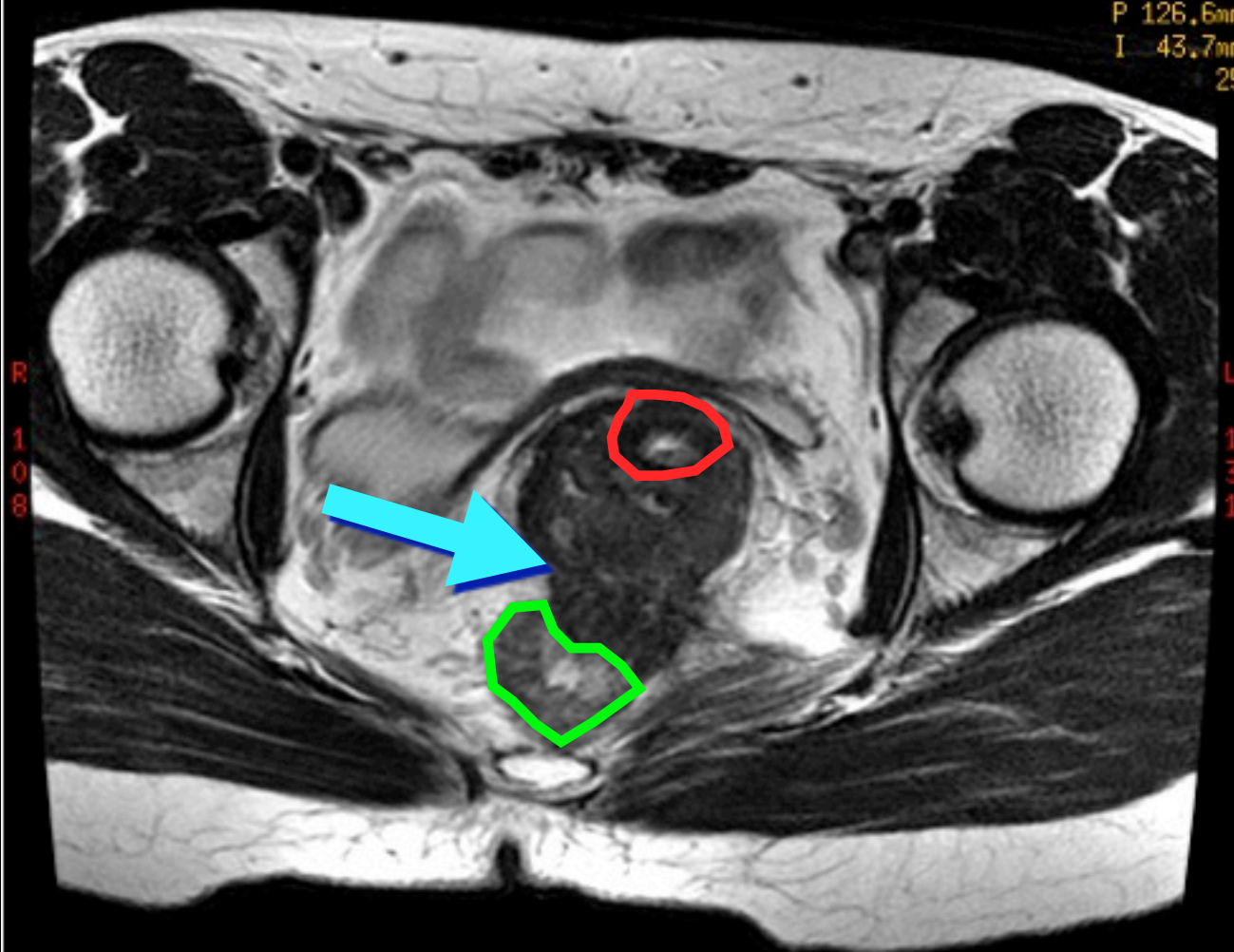
In: 10

R 72.4mm

P 126.6mm

I 43.7mm

25



rank = 11 / 20  
time = 0 sec

P 144

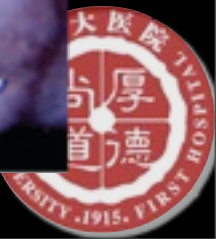
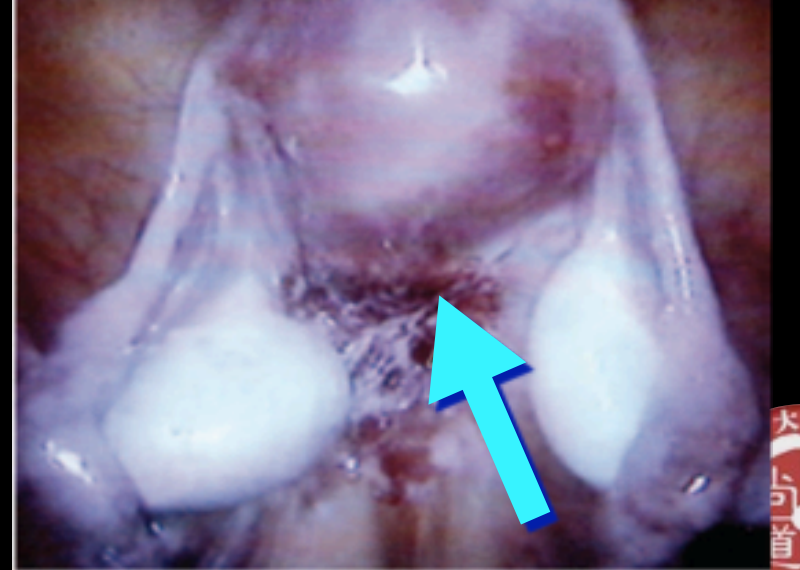
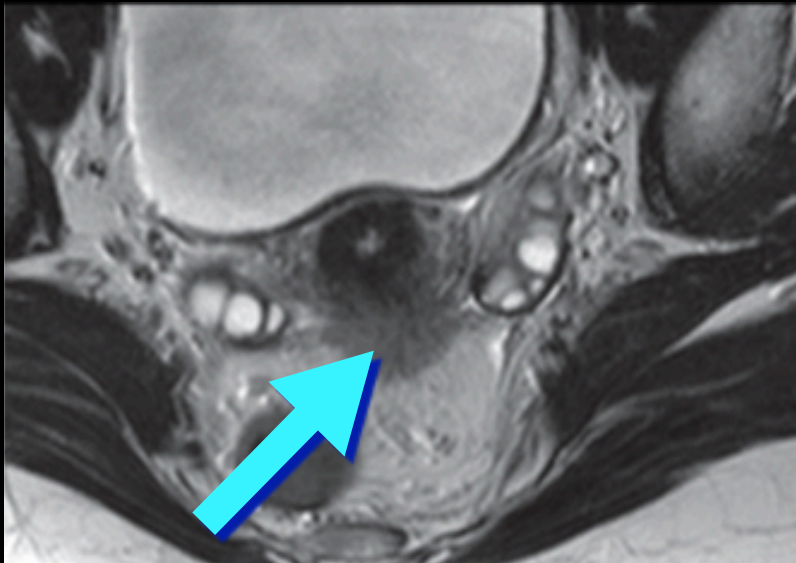
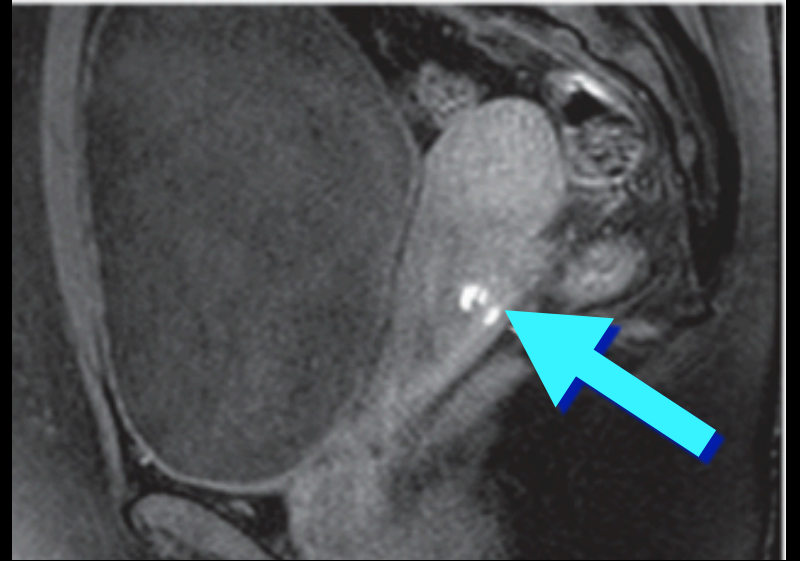
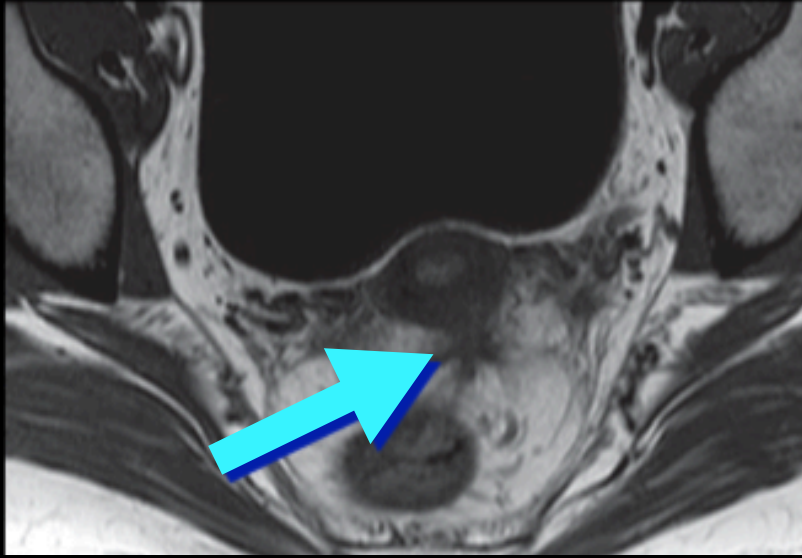
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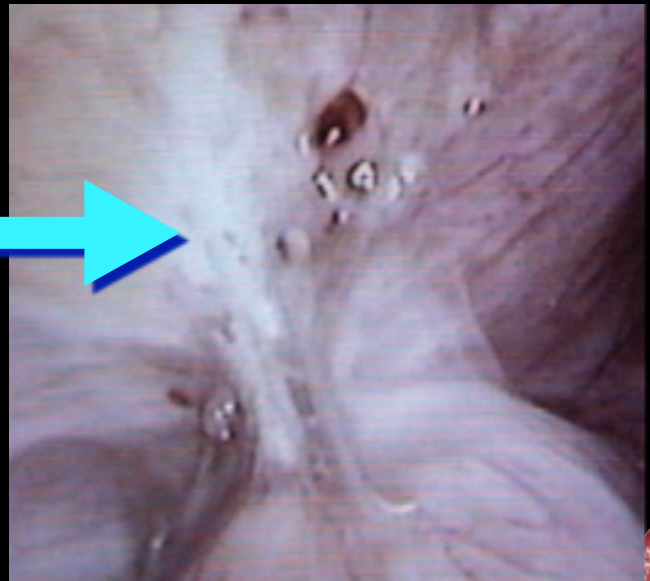
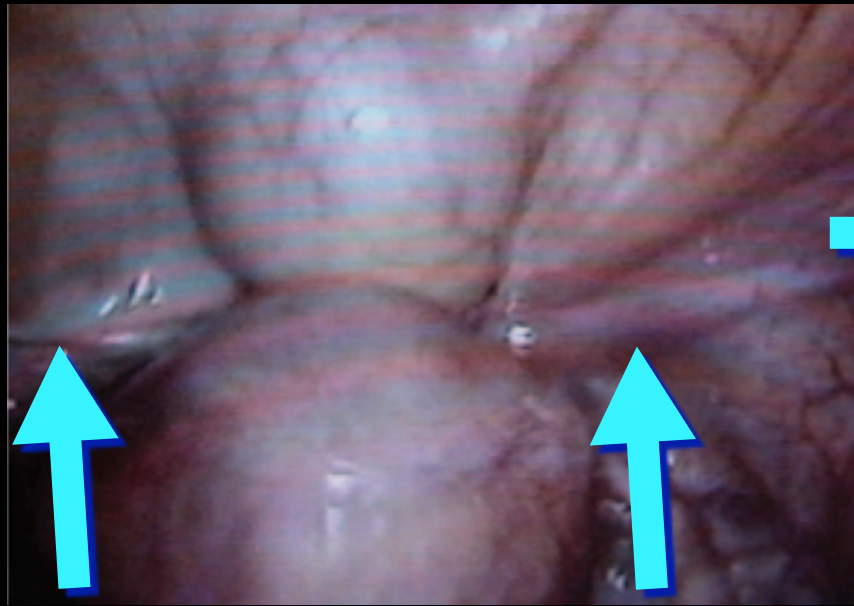
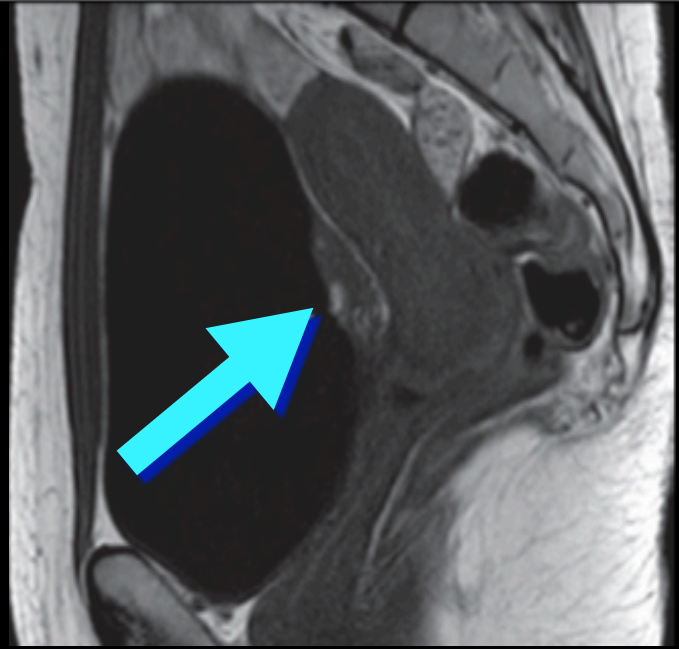
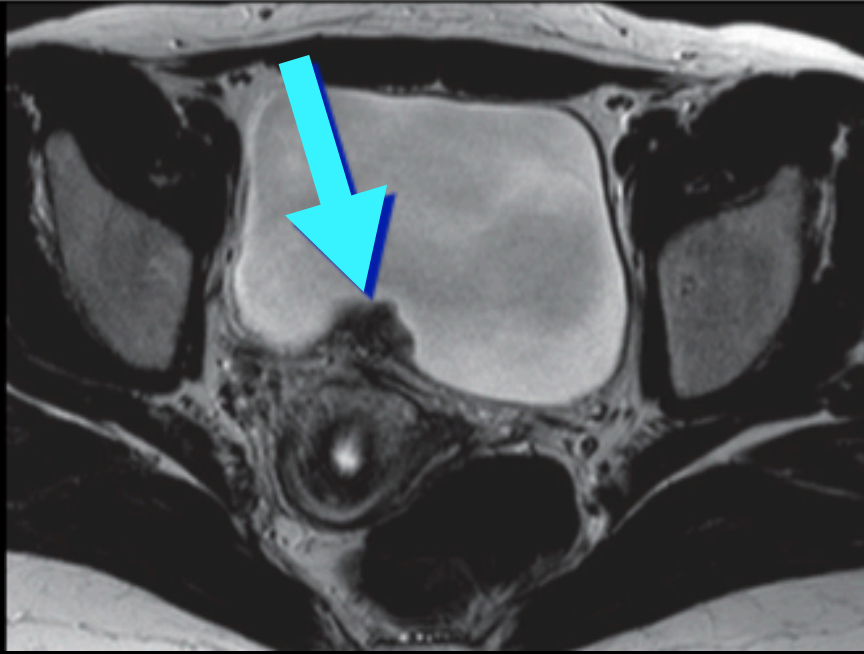












# 子宫内膜癌

- 最常见的妇科肿瘤，见于绝经后妇女，平均年龄50-54岁
- 临床表现：阴道出血
- B超诊断准确率80%，CT仅能评价淋巴结和骨转移
- MR可诊断分期：T2高信号的内膜增厚，不规则，结合带内出现高信号

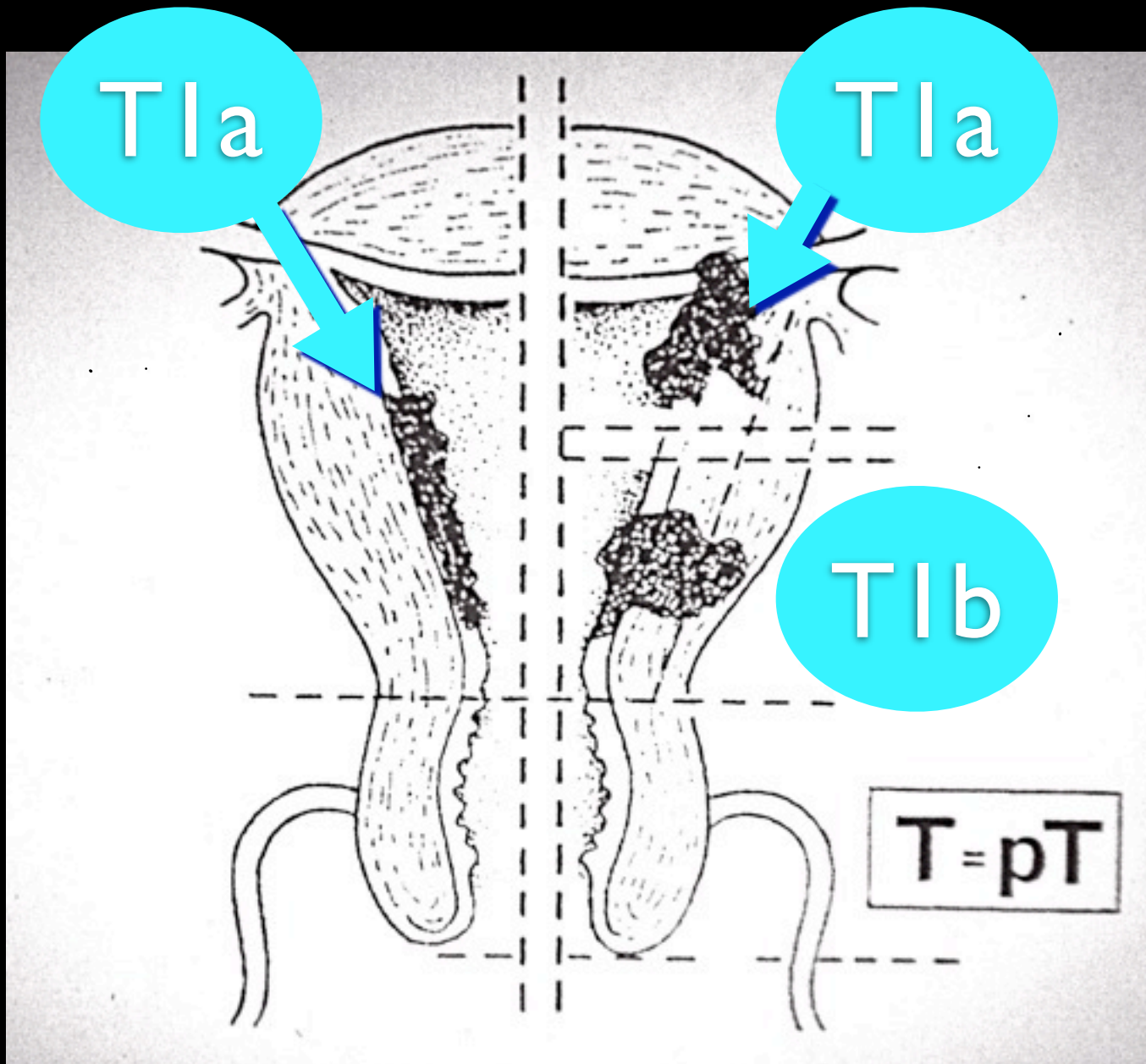


	2008FIGO分期	1988FIGO分期
I*	肿瘤局限于子宫体	
Ia*	肿瘤浸润深度 < 1/2肌层	Ia, Ib
Ib*	肿瘤浸润深度 > 1/2肌层	Ic
II*	肿瘤侵犯宫颈间质, 但无宫体外蔓延**	IIb
III*	肿瘤局部和/或区域扩散	
IIIa*	肿瘤累及浆膜层和/或附件 #	IIIa
IIIb*	阴道和/或宫旁受累 #	IIIb
IIIc*	盆腔淋巴结和/或主动脉旁淋巴结转移 #	
IIIc1*	盆腔淋巴结阳性	IIIc
IIIc2*	腹主动脉旁淋巴结阳性和/或盆腔淋巴结阳性	IVb
IV*	远处转移	
IVa*	肿瘤侵及膀胱或直肠粘膜	IVa
IVb*	远处转移	IVb

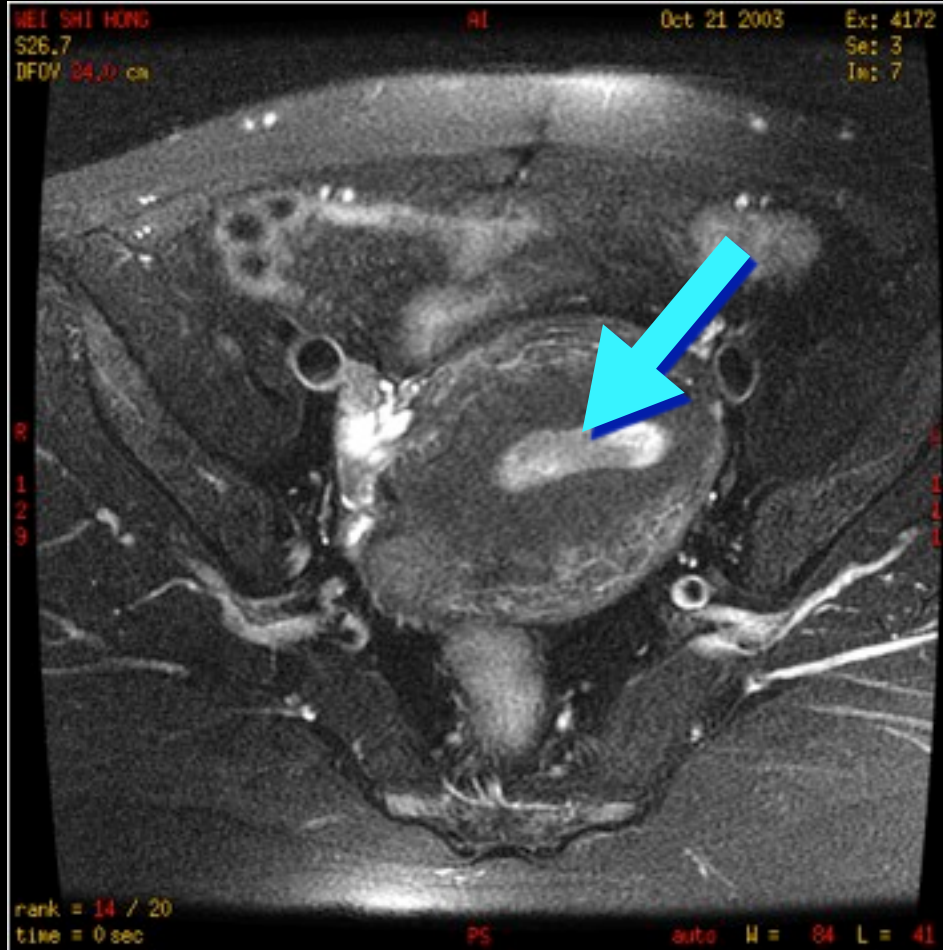
\* 无论G1,G2,G3 \*\* 仅宫颈内膜腺体受累应认为是I期, 不再认为是II期  
# 细胞学检查阳性单独报告, 不改变分期



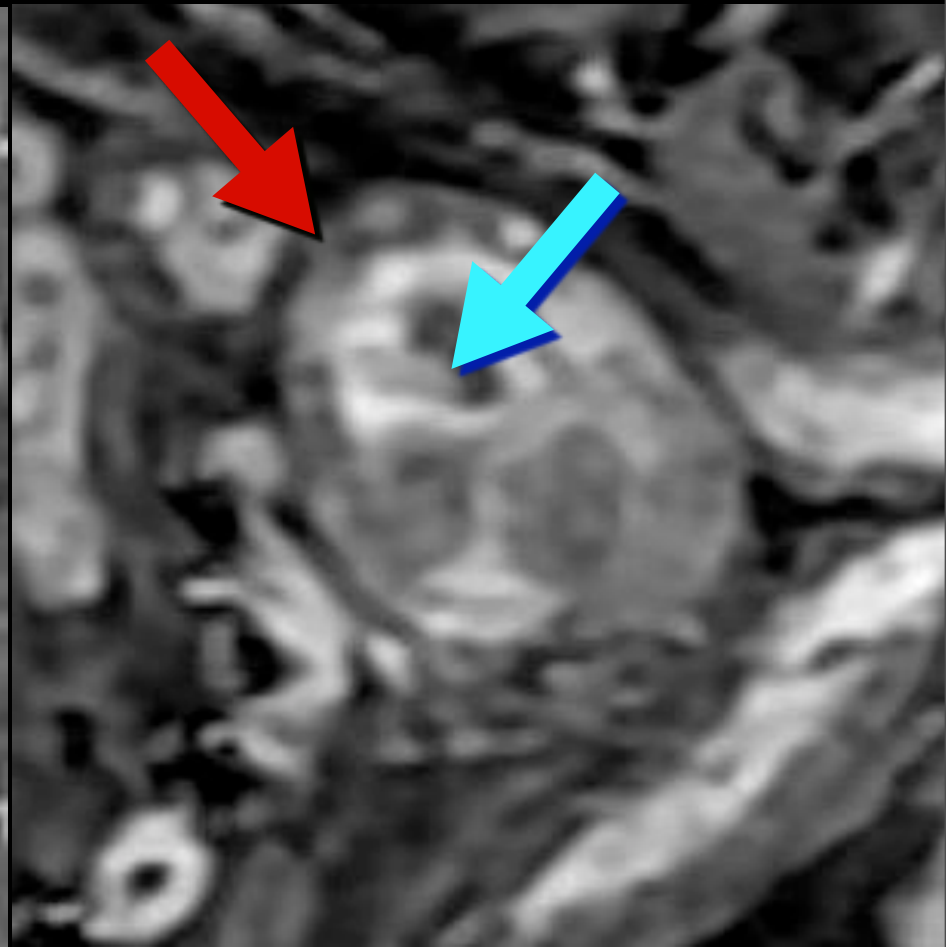
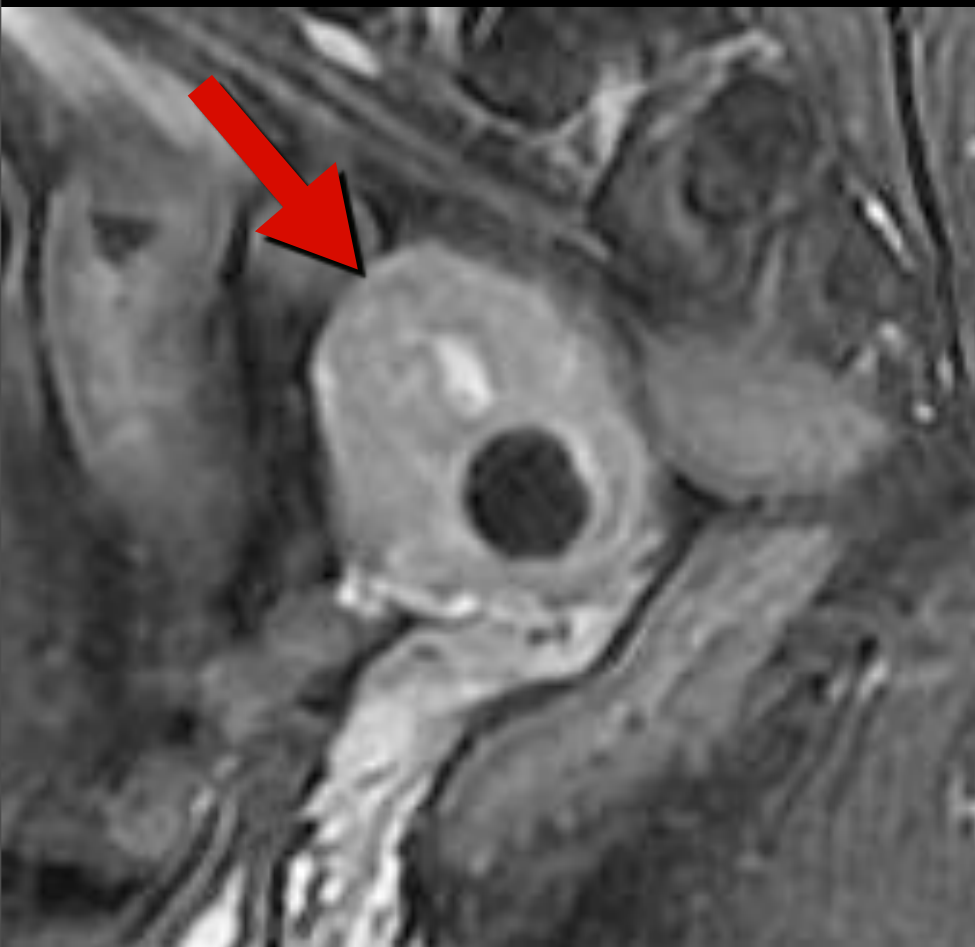
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<b>Vagina</b>	<p><b>SUMMARY OF CHANGES</b></p> <ul style="list-style-type: none"> <li>The definition of TNM and the stage grouping for this chapter have not changed from the Sixth Edition.</li> </ul>
<b>Cervix Uteri</b>	<p><b>SUMMARY OF CHANGES</b></p> <ul style="list-style-type: none"> <li>The definition of TNM and the stage grouping for this chapter have changed from the Sixth Edition and reflect new staging adopted by the International Federation of Gynecology and Obstetrics (FIGO) (2008).</li> </ul>
<b>Corpus Uteri</b>	<p><b>SUMMARY OF CHANGES</b></p> <ul style="list-style-type: none"> <li>The definition of TNM and the stage grouping for this chapter have changed from the Sixth Edition and reflect new staging adopted by the International Federation of Gynecology and Obstetrics (FIGO) (2008).</li> <li>A separate staging schema adopted by FIGO for uterine sarcoma has been added.</li> </ul>
<b>Ovary and Primary Peritoneal Carcinoma</b>	<p><b>SUMMARY OF CHANGES</b></p> <ul style="list-style-type: none"> <li>The definition of TNM and the stage grouping for this chapter have not changed from the Sixth Edition.</li> <li>Primary peritoneal carcinoma has been included in this chapter.</li> </ul>
<b>Fallopian Tube</b>	<p><b>SUMMARY OF CHANGES</b></p> <ul style="list-style-type: none"> <li>The definition of TNM and the stage grouping for this chapter have not changed from the Sixth Edition.</li> </ul>
<b>Gestational Trophoblastic Tumors</b>	<p><b>SUMMARY OF CHANGES</b></p> <ul style="list-style-type: none"> <li>The definition of TNM and the stage grouping for this chapter have not changed from the Sixth Edition.</li> </ul>



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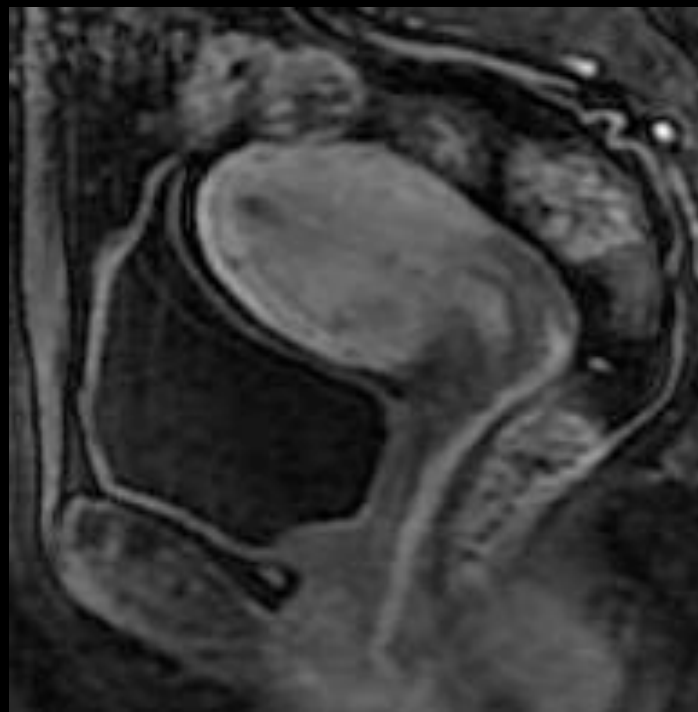
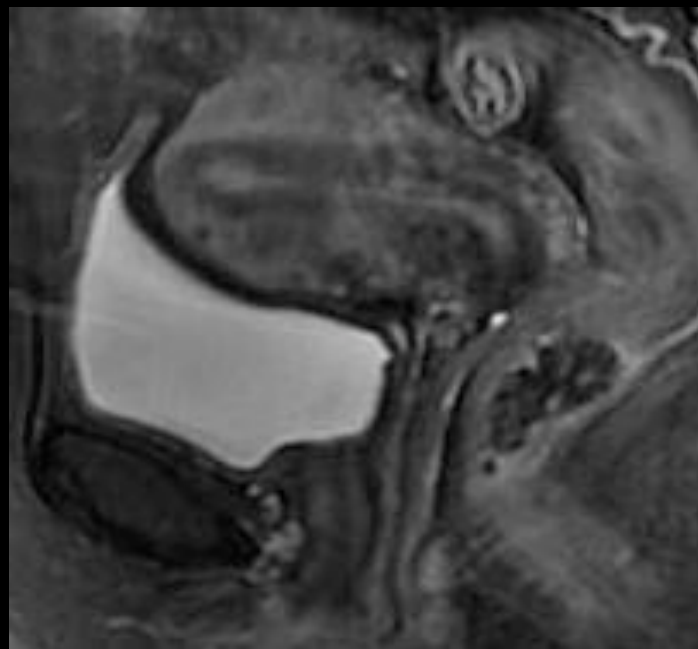


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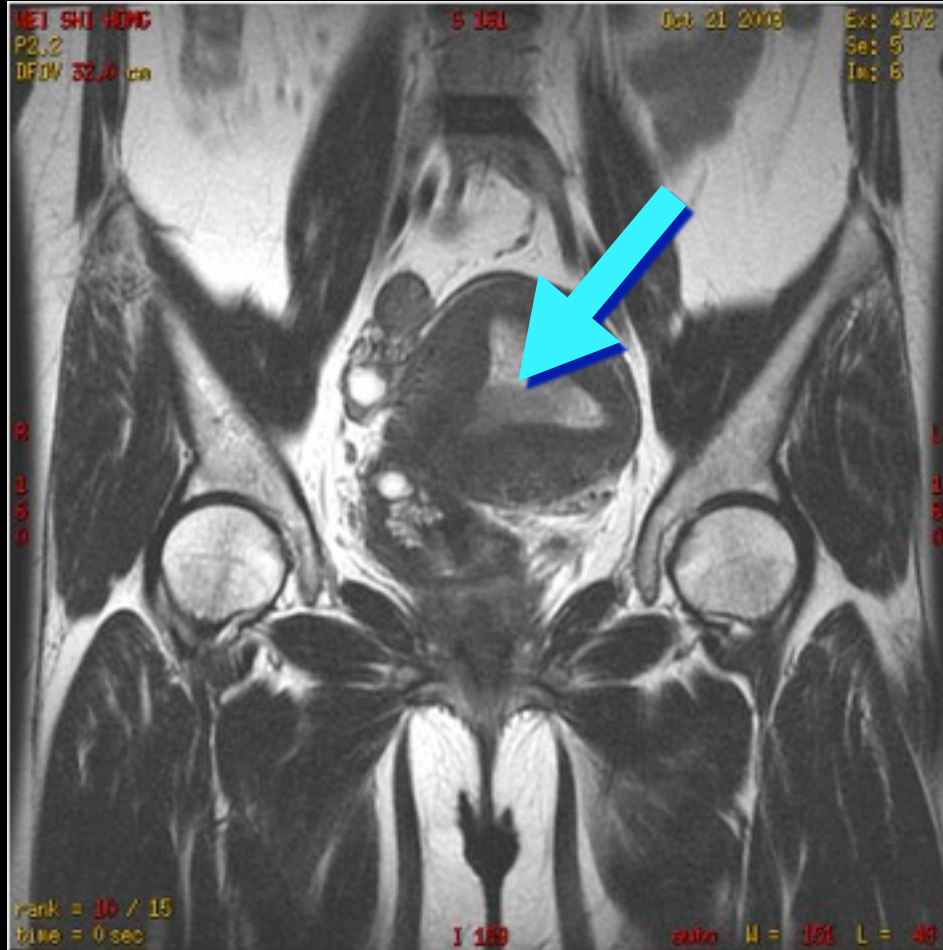




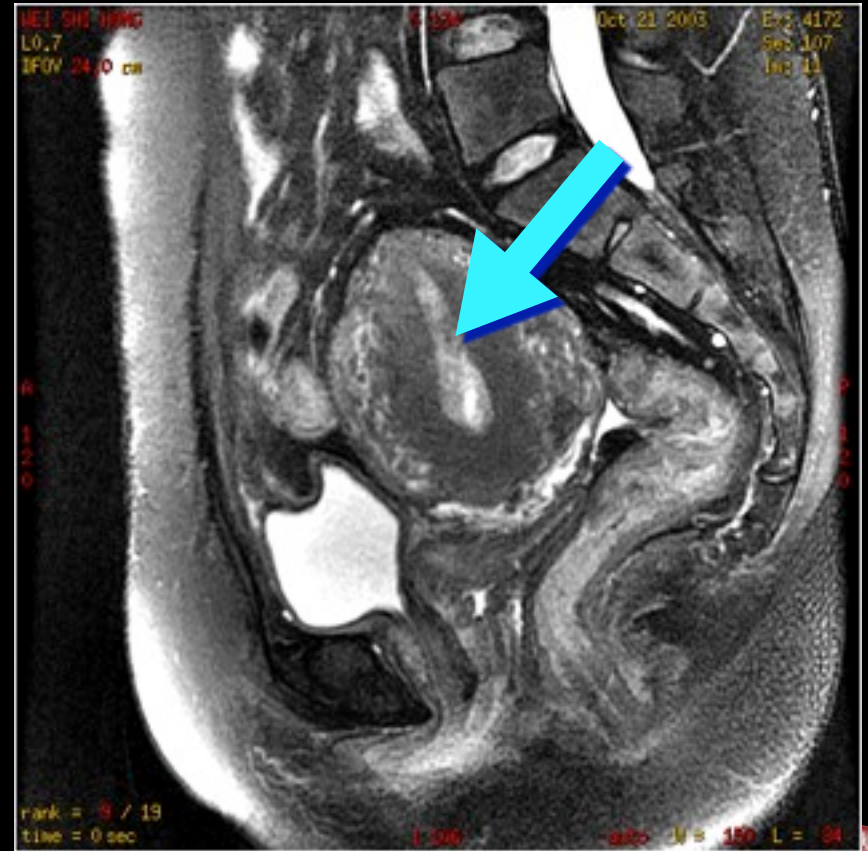
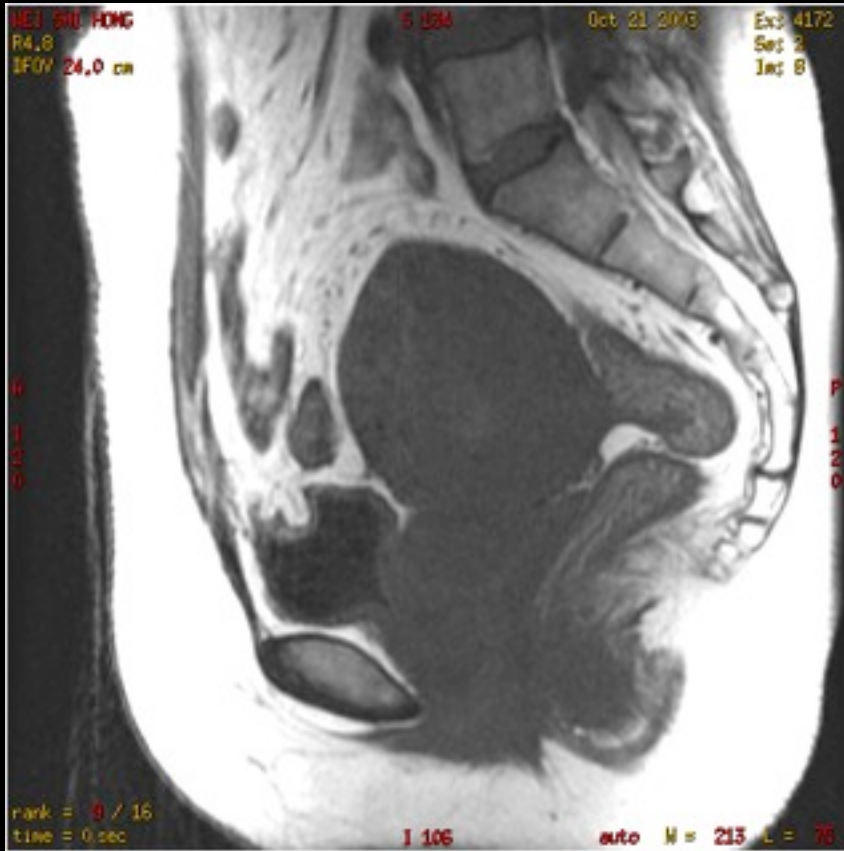
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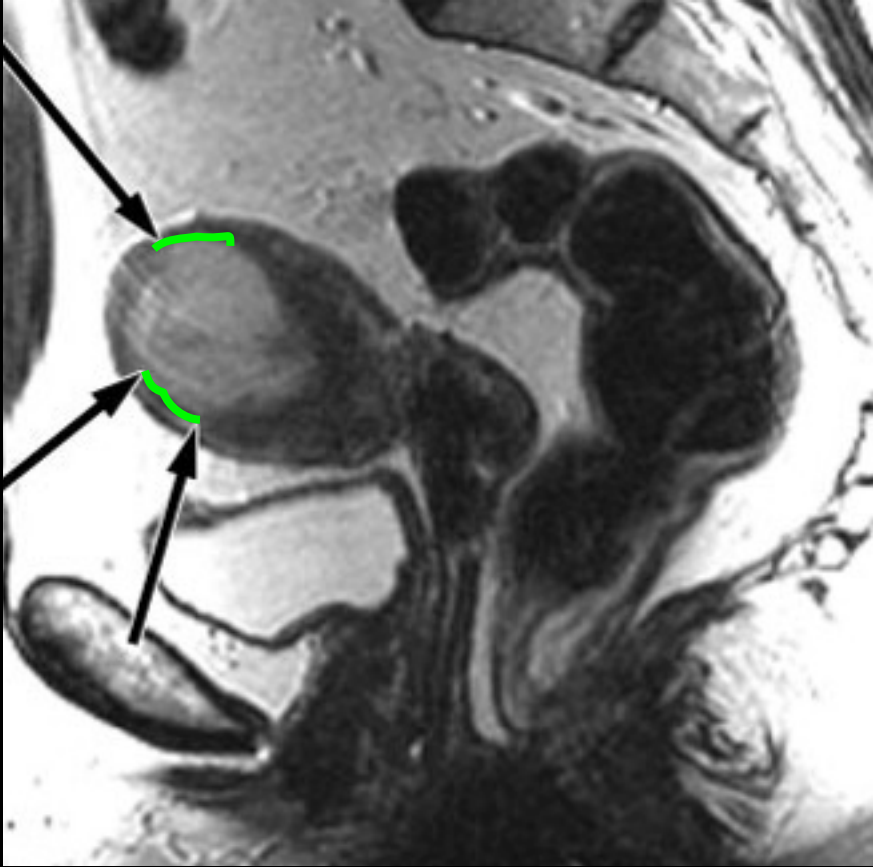
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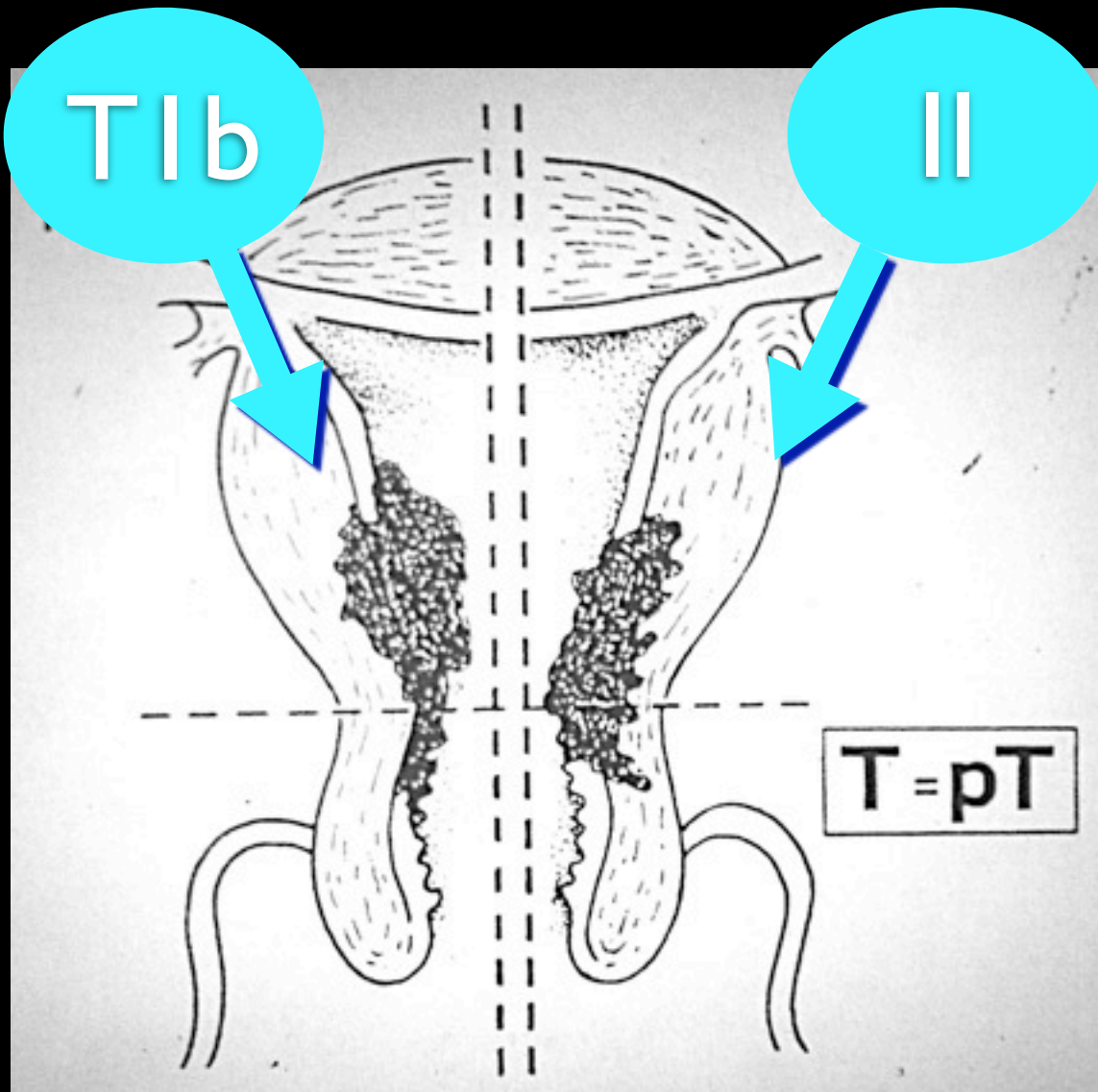


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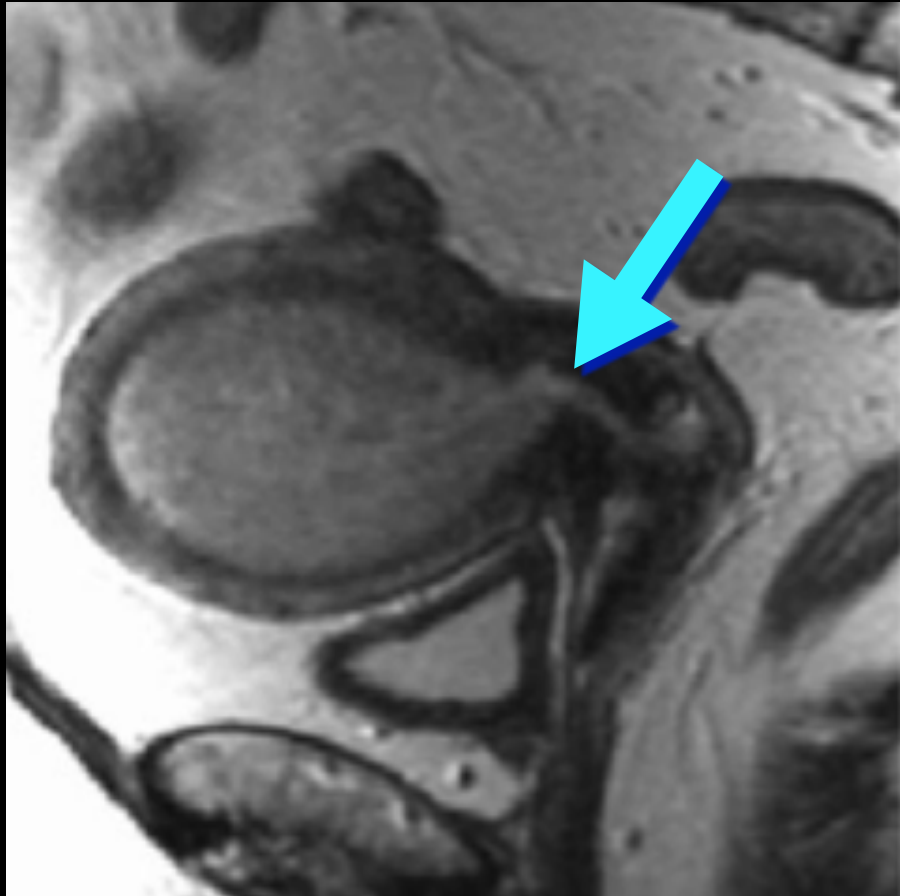


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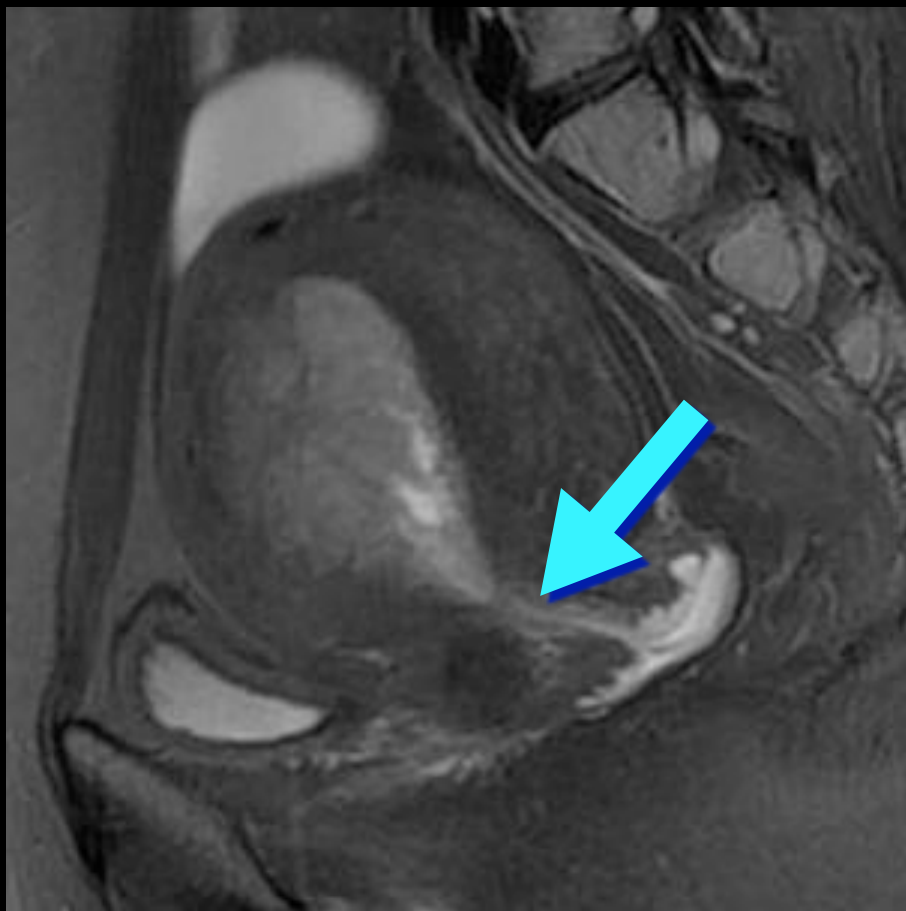




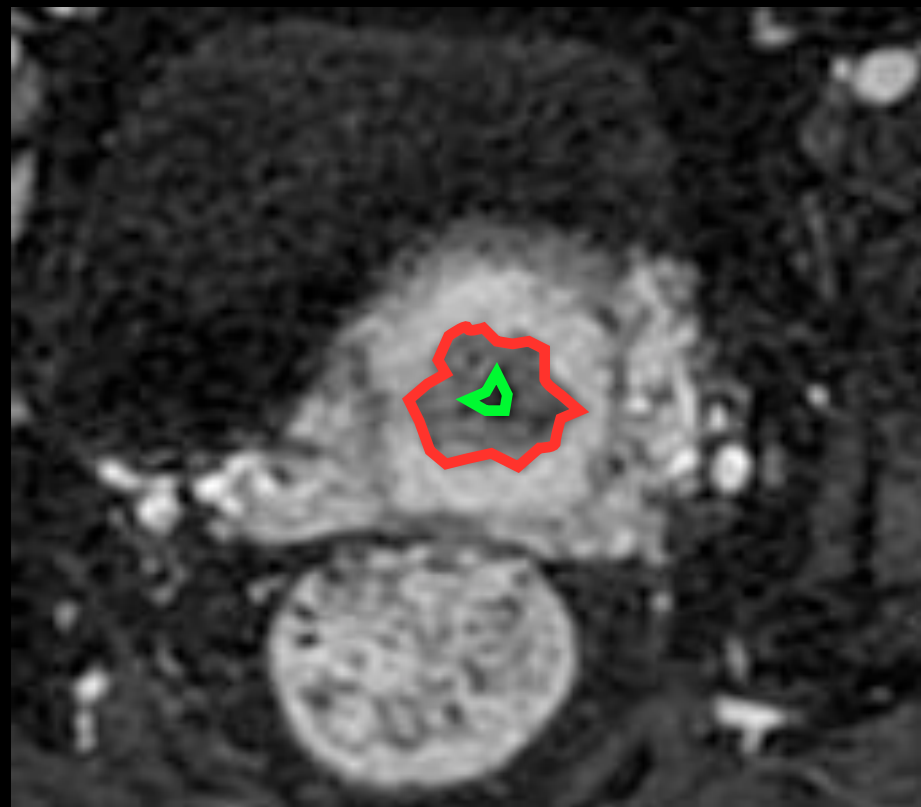
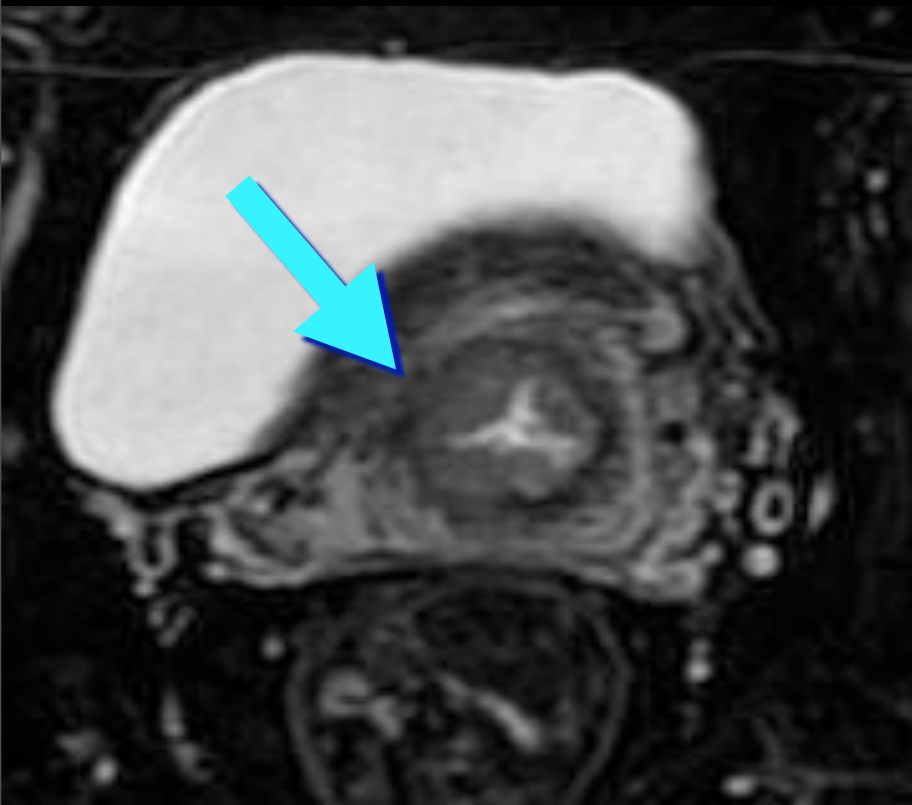
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# I (T1b)

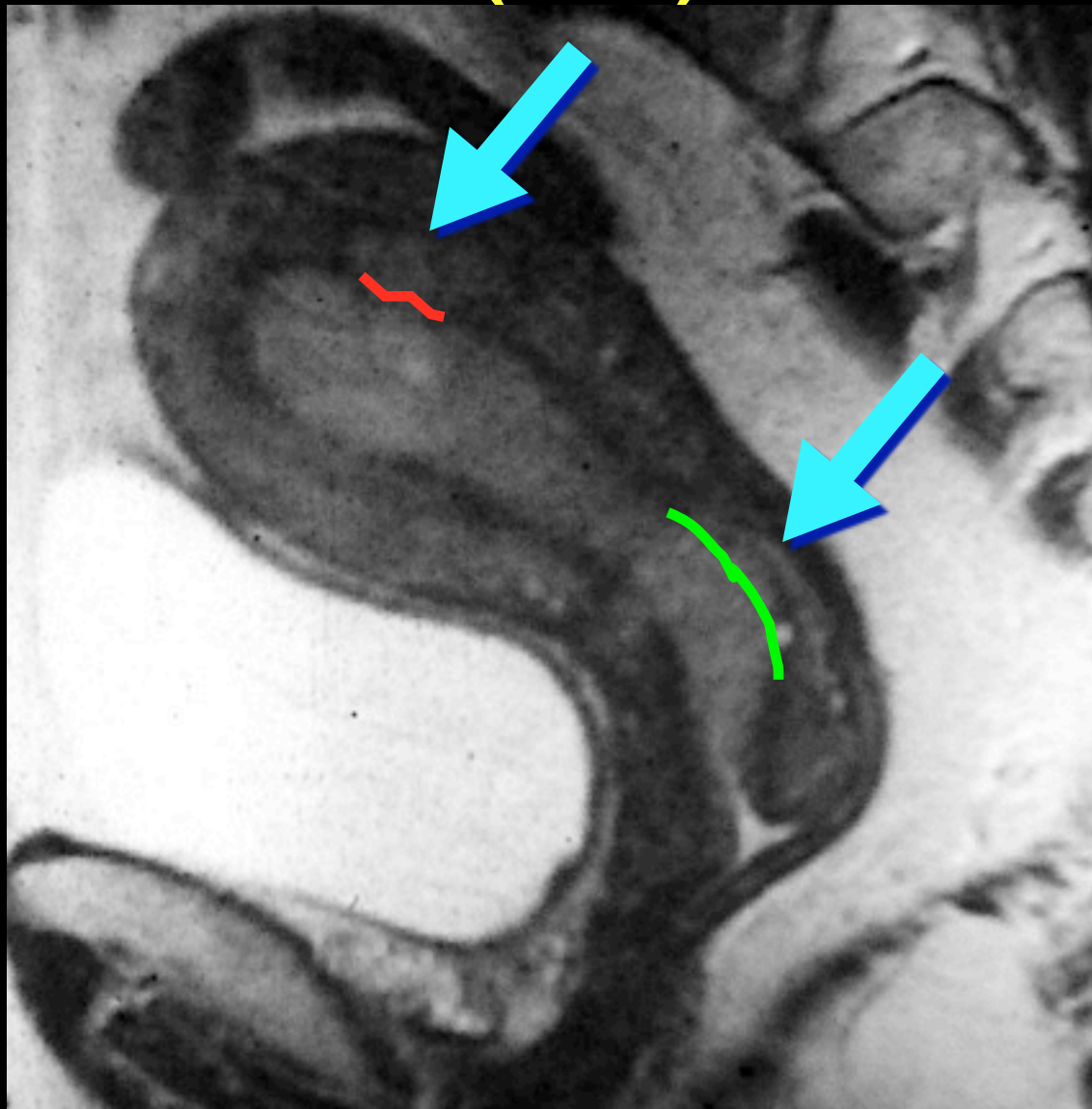


# II(T2)





# II(T2)

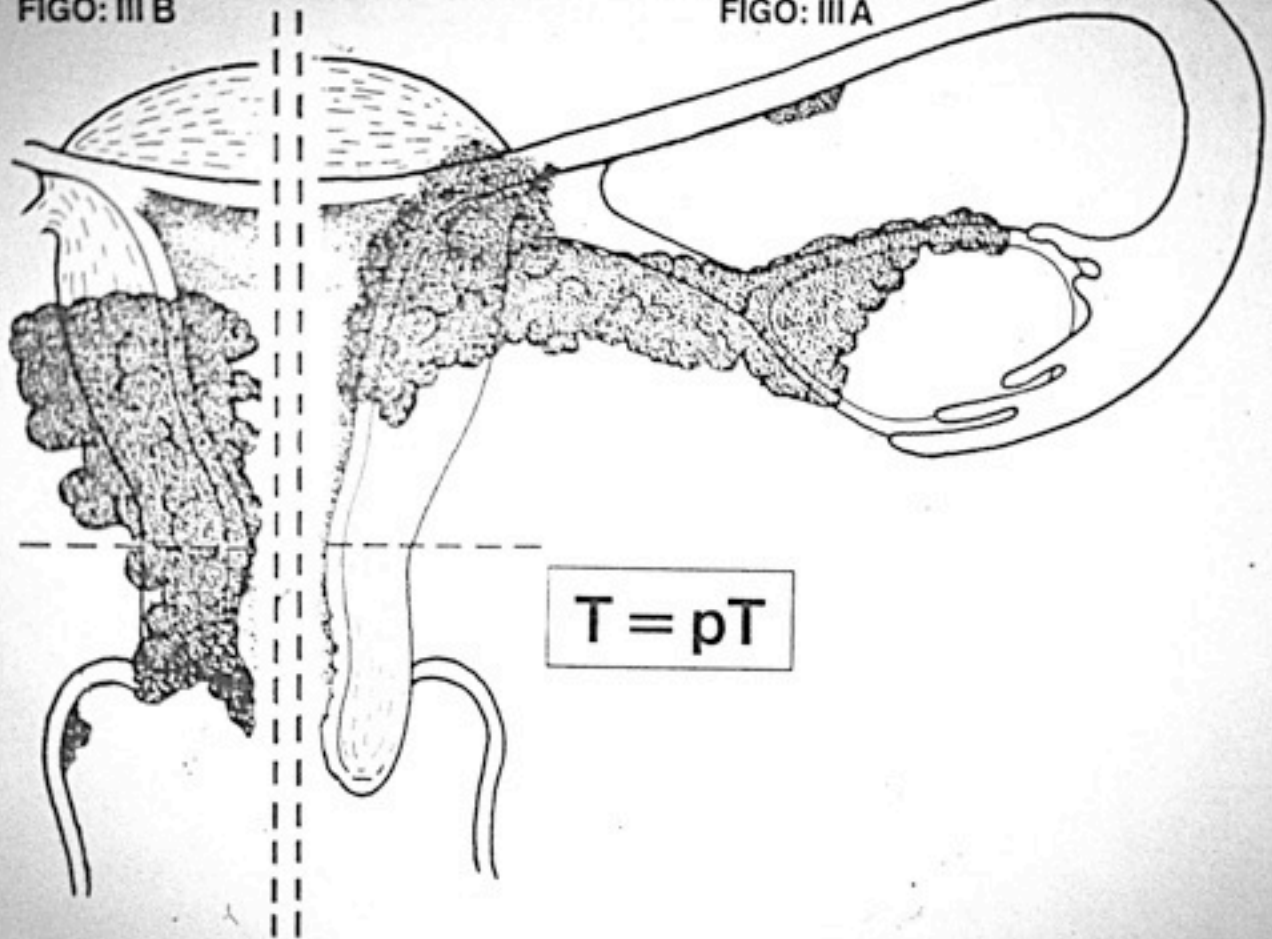


# II (T2)



TNM: **T3b**  
FIGO: III B

TNM: **T3a**  
FIGO: III A



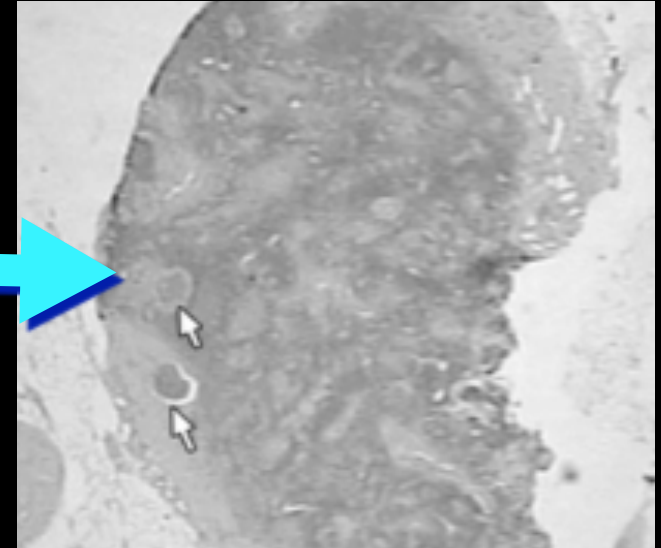
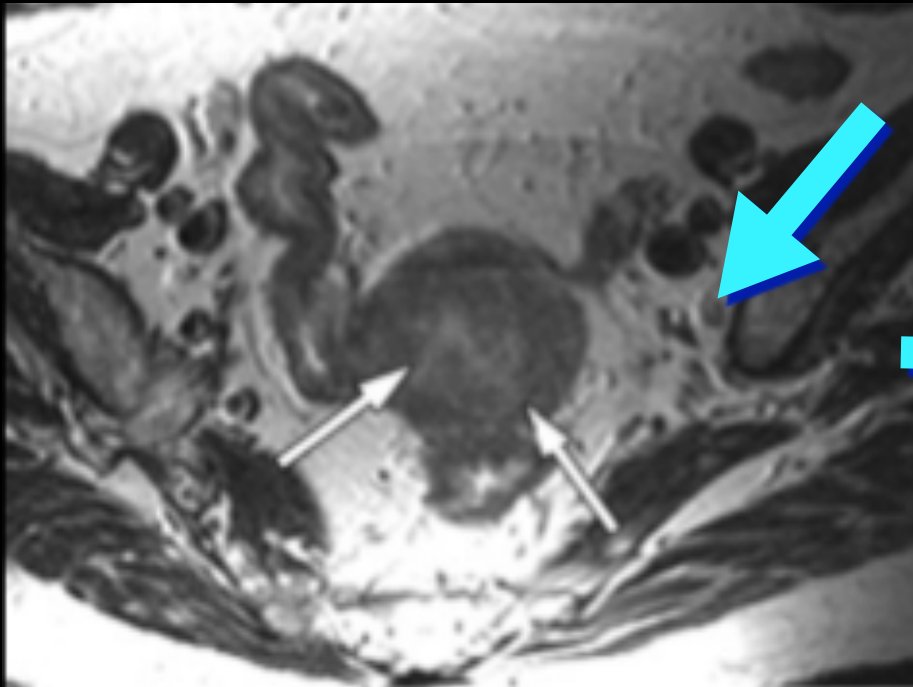


TNM: T4  
FIGO: IVA

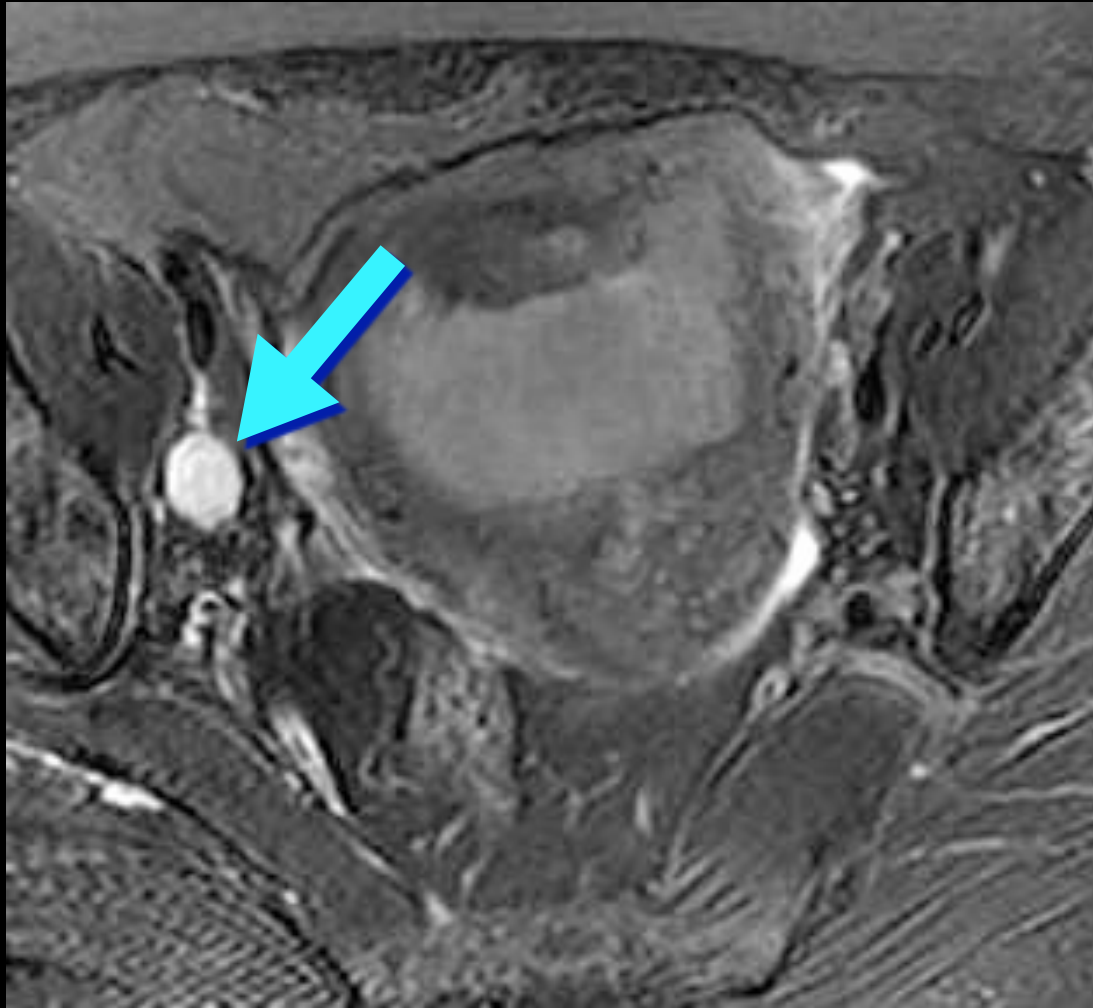
pT4



# III CI (T1b NI)



# III CI (T1b NI)



- MR检查技术
- 正常子宫的MR表现
- 子宫体病变
- 子宫颈病变





# MR Protocol of Cervix

Time	Pulse Sequence	Location	Resolution	Observations
4min	Axial T2WI without fatsat	Cervix	high	tumor and parametrium invasion
4min	Coronal T2 without fatsat	Cervix and pelvis	high	tumor and parametrium invasion; lymph node
2min	Axial T1WI	Pelvis		parametrium invasion; bone metastasis
2min	Axial T2WI with or without fatsat	Pelvis		lymph node



# 正常分层

- 宫颈内膜
- 纤维基质
- 最外层



# 正常解剖及生理变异

## 高分辨率T2W

- 粘液层:高信号带
- 粘膜层:中等信号.常见毛刷子样粘膜皱襞
- 纤维基质:低信号带,3-8mm
- 外层:中等信号,为平滑肌,与宫体外肌层延续

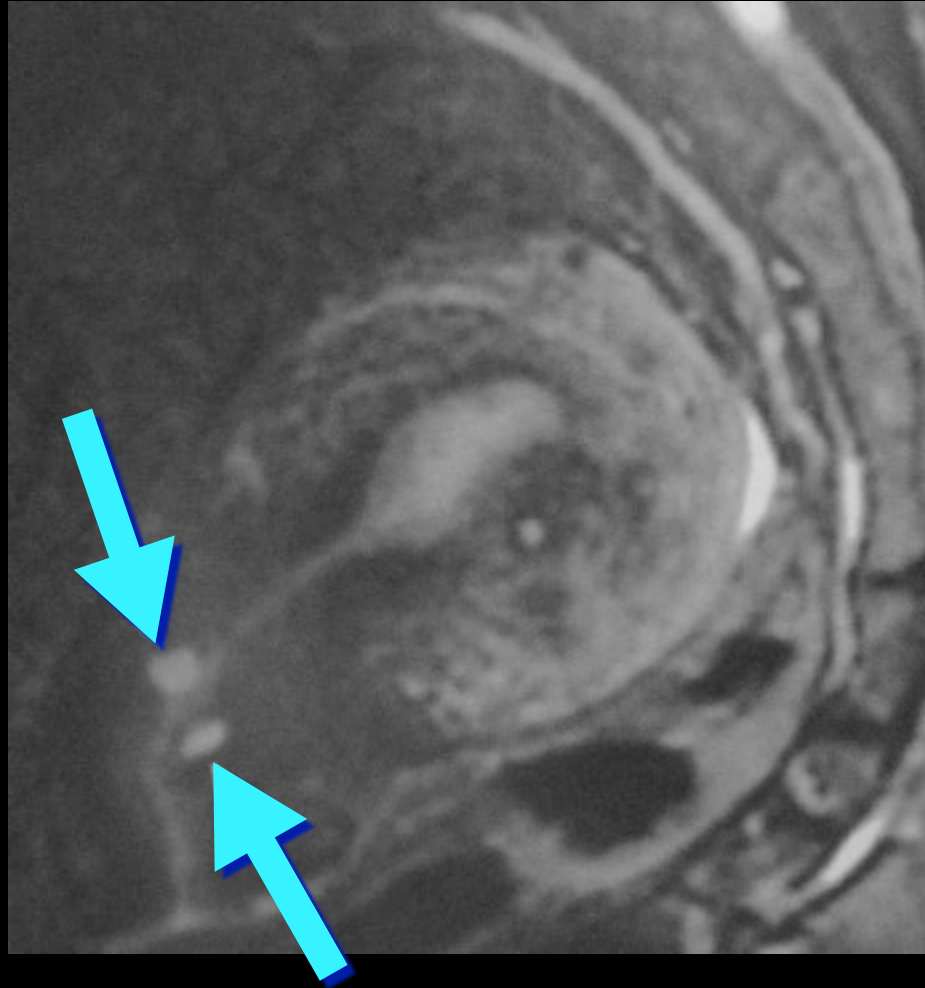


# 宫颈良性病变

- Nabothian 囊肿
- 宫颈狭窄(stenosis)



# Nabothian 囊肿



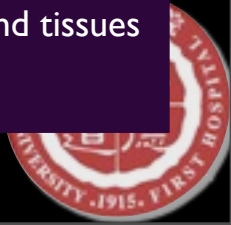
# 宫颈癌

- 95%以上为鳞癌，平均发病年龄45-55岁
- 宫颈肿块，宫腔积液
- MR: T1低信号，T2中高信号，增强后有强化



# 2008 FIGO Staging

Stage	Description
0	Carcinoma in situ. Tumor is present only in the epithelium (cells lining the cervix) and has not invaded deeper tissues.
I	Invasive cancer with tumor strictly confined to the cervix.
IA	In this earliest form of stage I, a very small amount of tumor can be seen under a microscope.
IA1	Tumor has penetrated an area less than 3 millimeters deep and less than 7 millimeters wide.
IA2	Tumor has penetrated an area 3 to 5 millimeters deep and less than 7 millimeters wide.
IB	This stage includes tumors that can be seen without a microscope. It also includes tumors that cannot be seen without a microscope but that are more than 7 millimeters wide and have penetrated more than 5 millimeters of connective cervical tissue.
IB1	Tumor that is no bigger than 4 centimeters.
IB2	Tumor that is bigger than 4 centimeters. Tumor has spread to organs and tissues outside the cervix but is still limited to the pelvic area.



# 2008 FIGO Staging

Stage	Description
II	Invasive cancer with tumor extending beyond the cervix and/or the upper two-thirds of the vagina, but not onto the pelvic wall.
IIA1	Tumor has spread beyond the cervix to the upper part of the vagina. No parametrium invasion. Tumor that is no bigger than 4 centimeters.
IIA2	Tumor has spread beyond the cervix to the upper part of the vagina. No parametrium invasion. Tumor is bigger than 4 centimeters.
IIB	Tumor has spread to the tissue next to the cervix.
III	Invasive cancer with tumor spreading to the lower third of the vagina or onto the pelvic wall; tumor may be blocking the flow of urine from the kidneys to the bladder.
IIIA	Tumor has spread to the lower third of the vagina.
IIIB	Tumor has spread to the pelvic wall and/or blocks the flow of urine from the kidneys to the bladder.



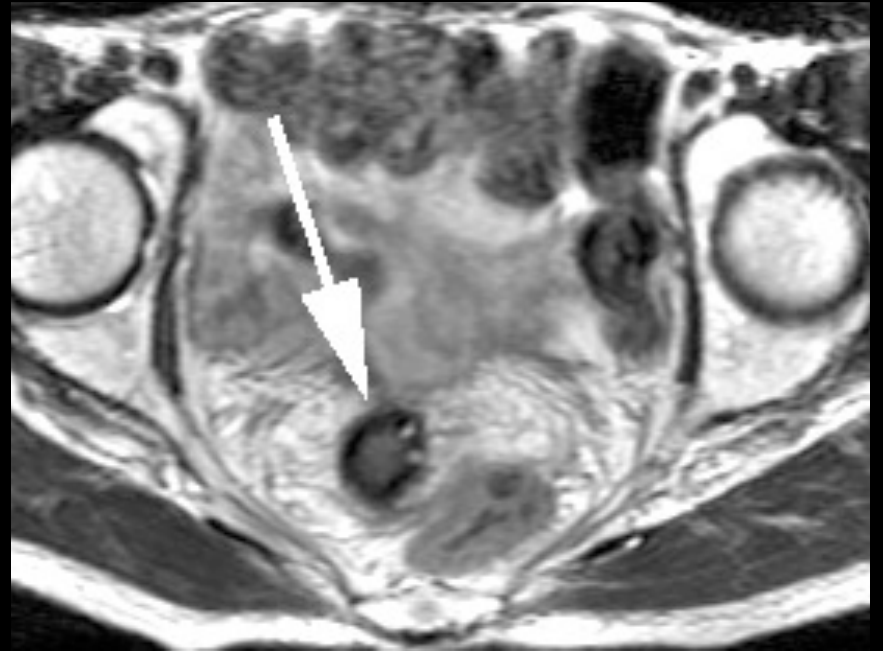
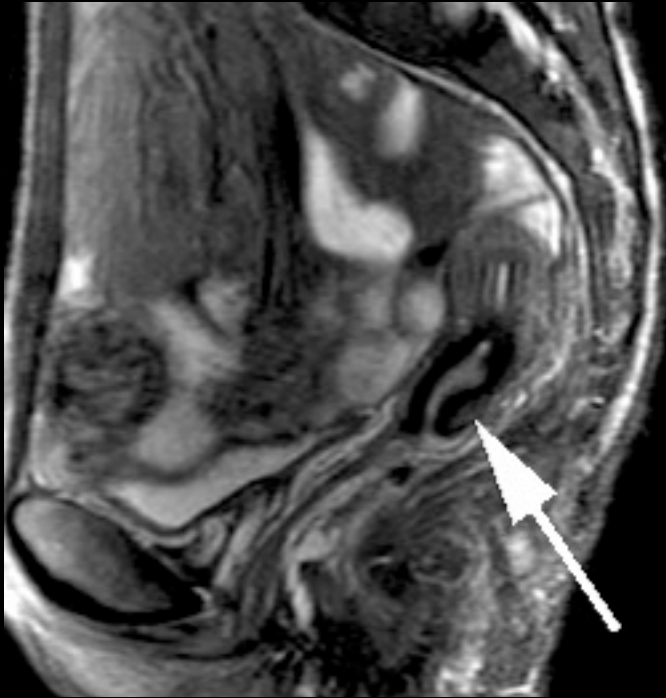


# 2008 FIGO Staging

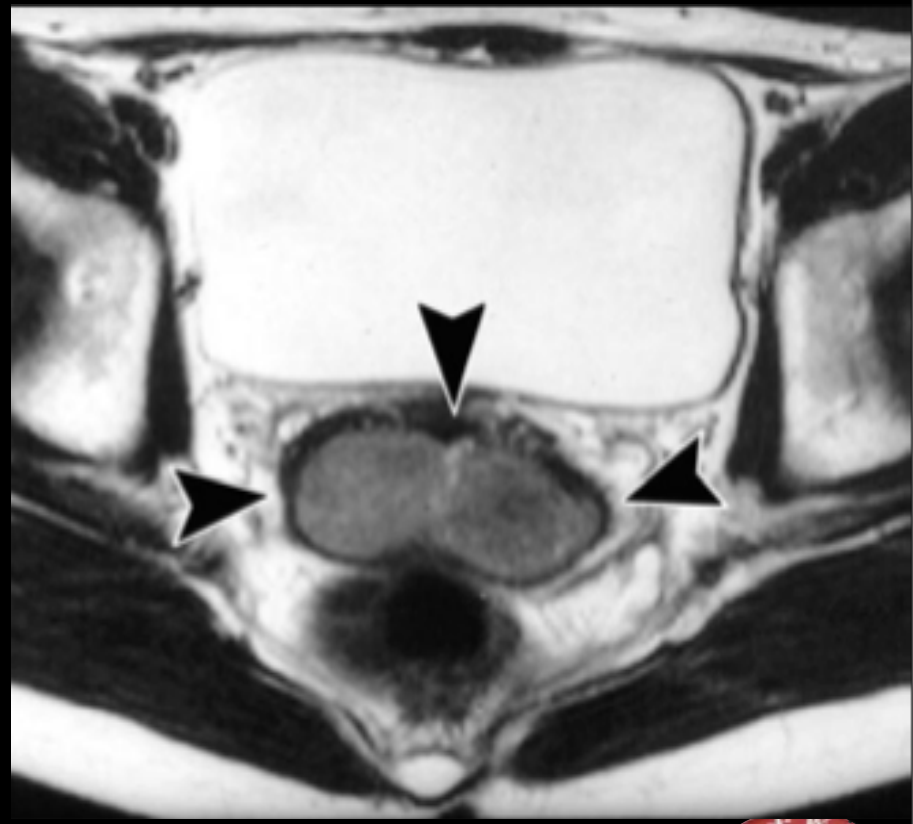
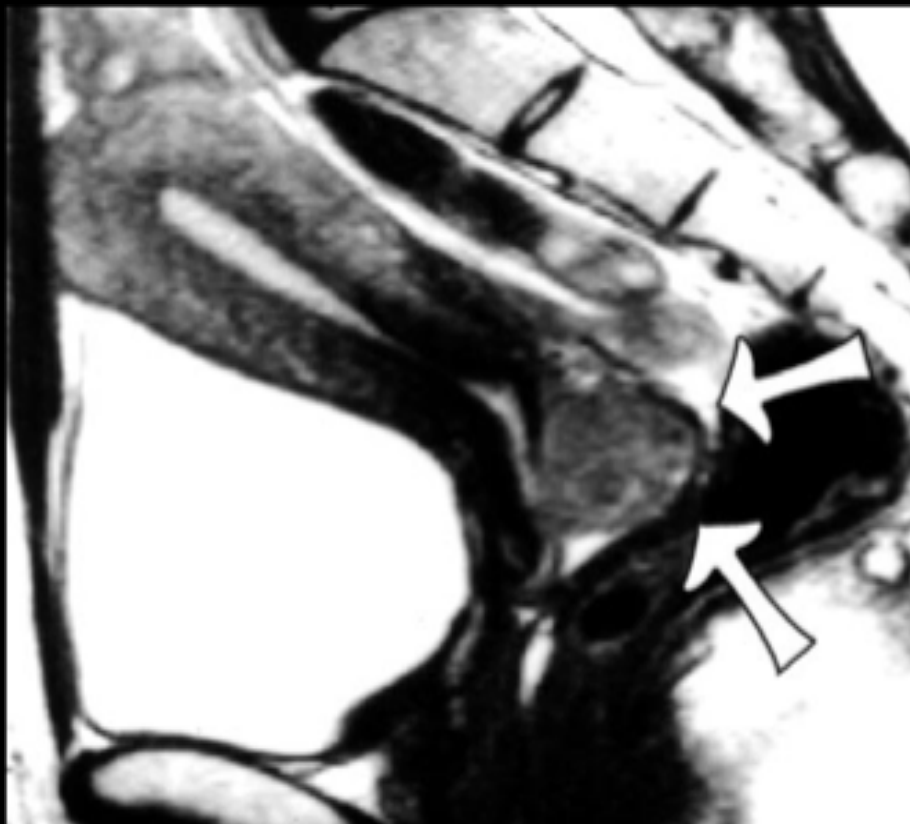
Stage	Description
IV	Invasive cancer with tumor spreading to other parts of the body. This is the most advanced stage of cervical cancer.
IVA	Tumor has spread to organs located near the cervix, such as the bladder or rectum.
IVB	Tumor has spread to parts of the body far from the cervix.



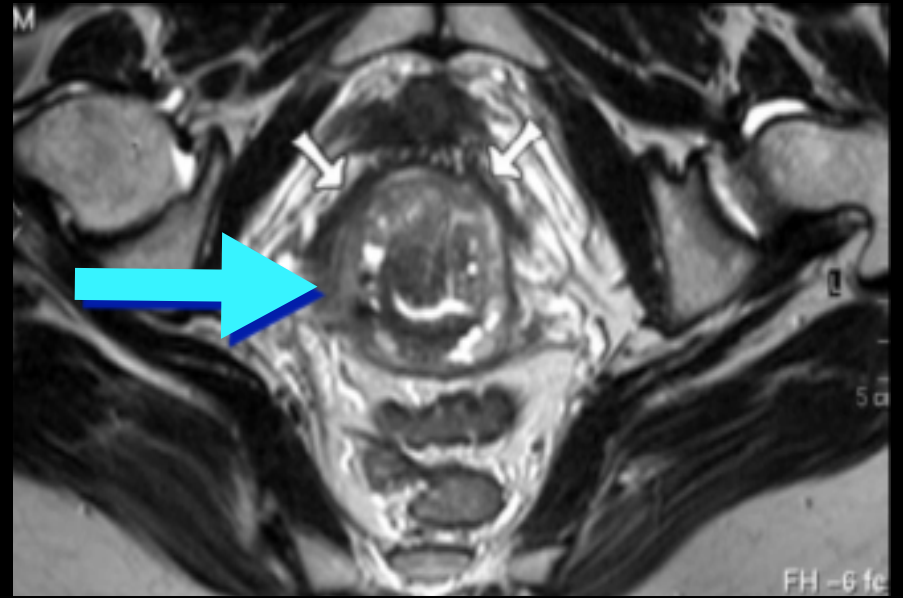
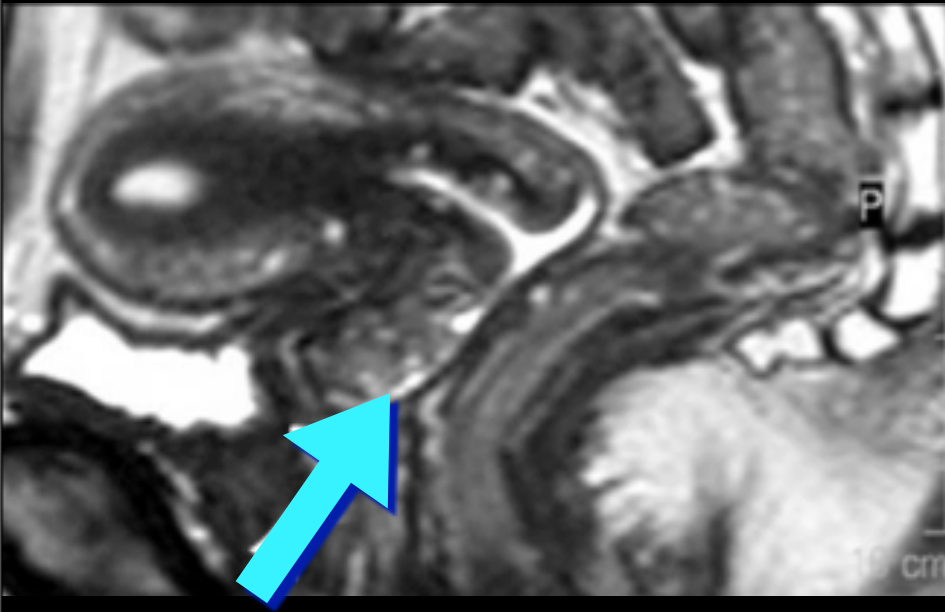
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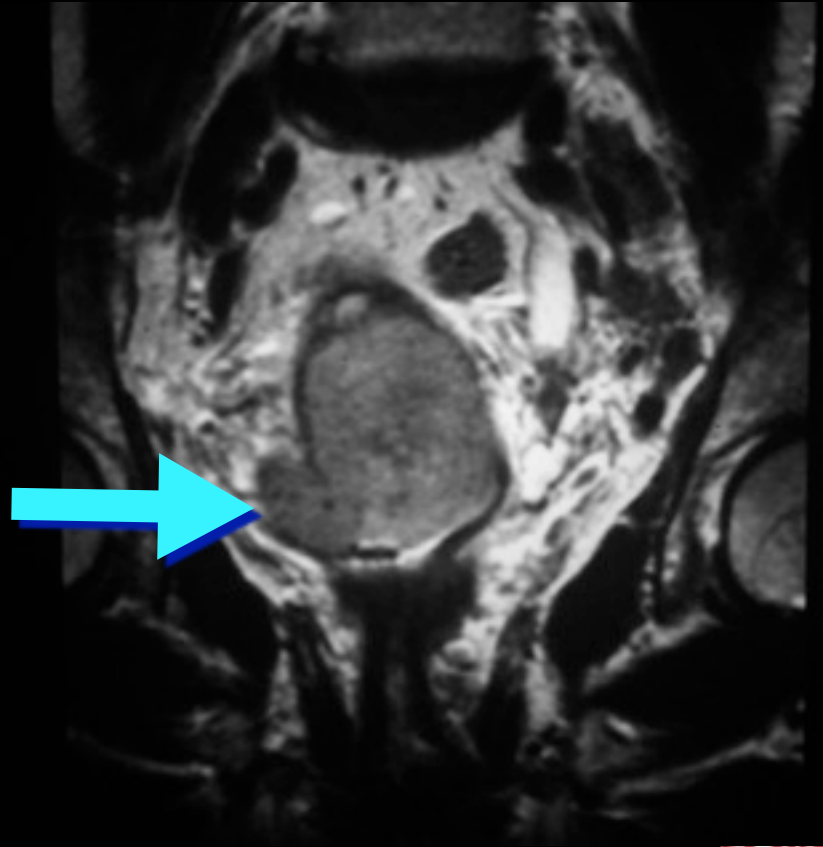
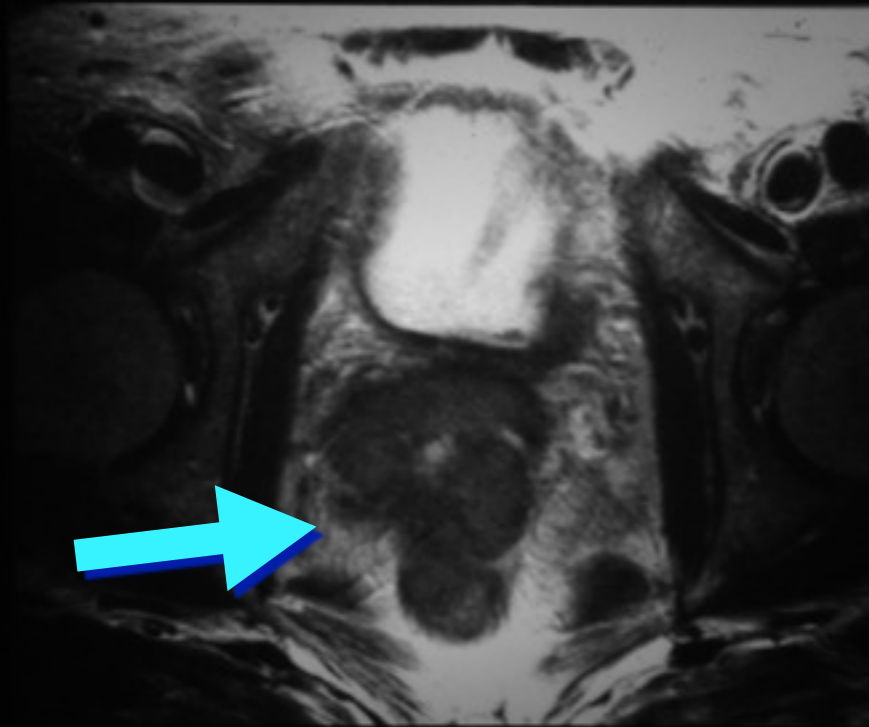
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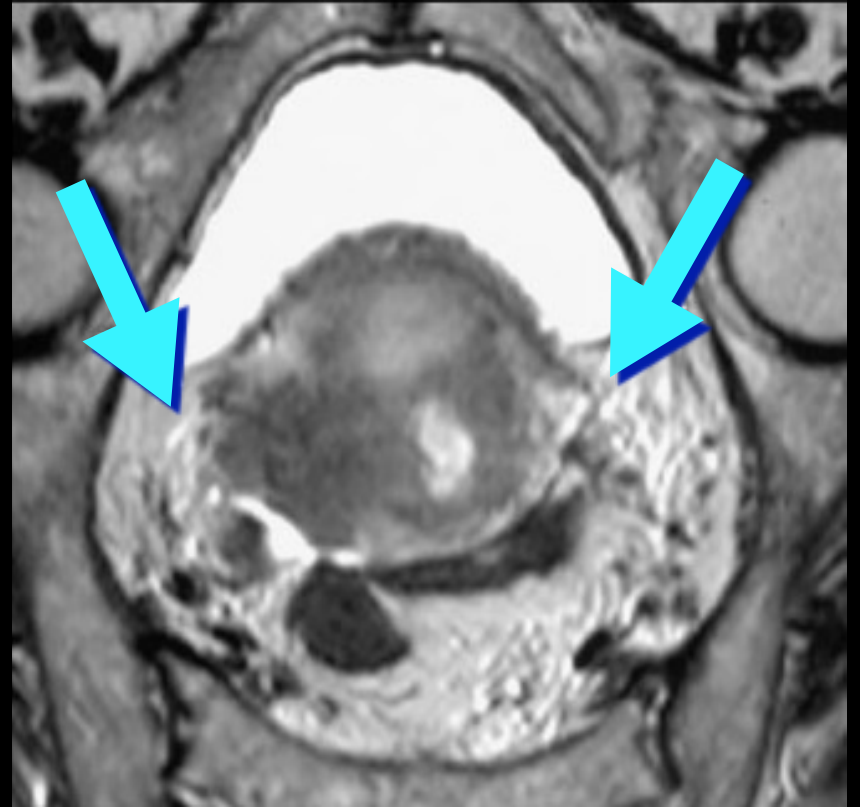
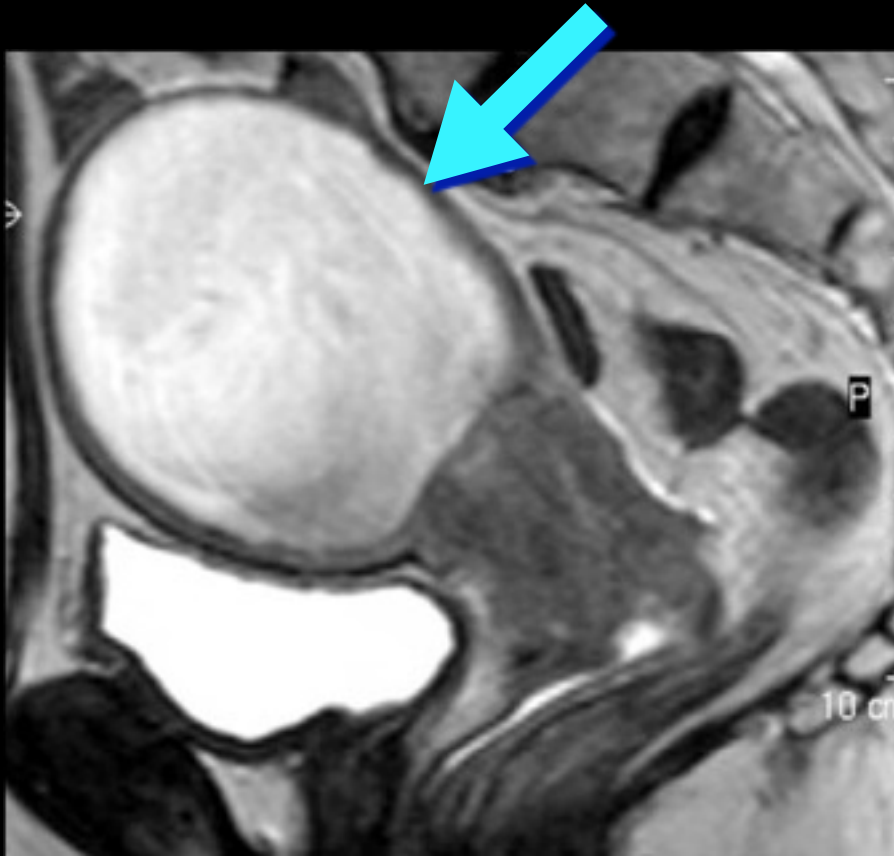
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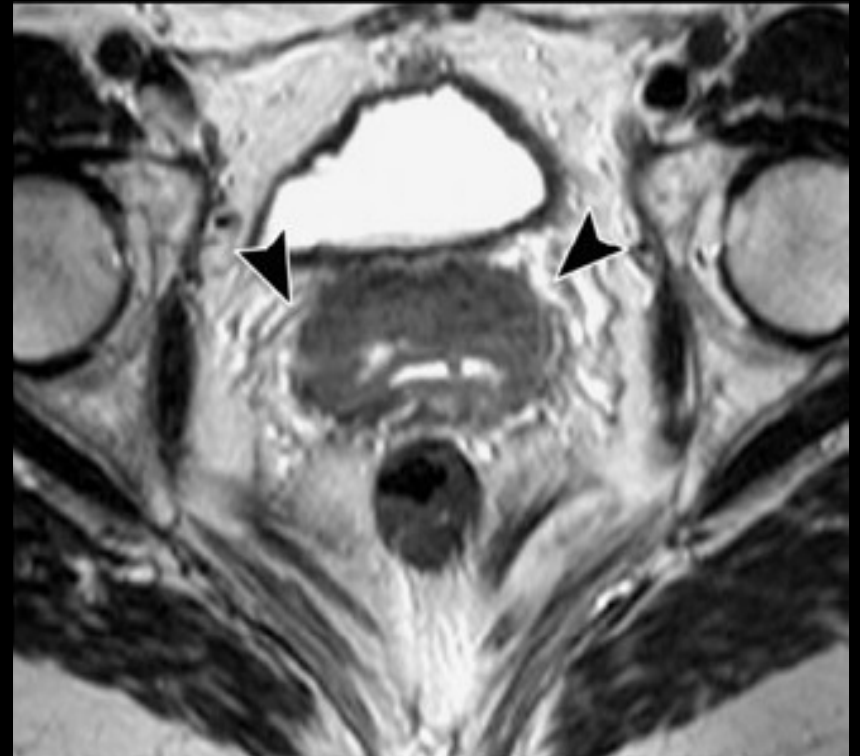
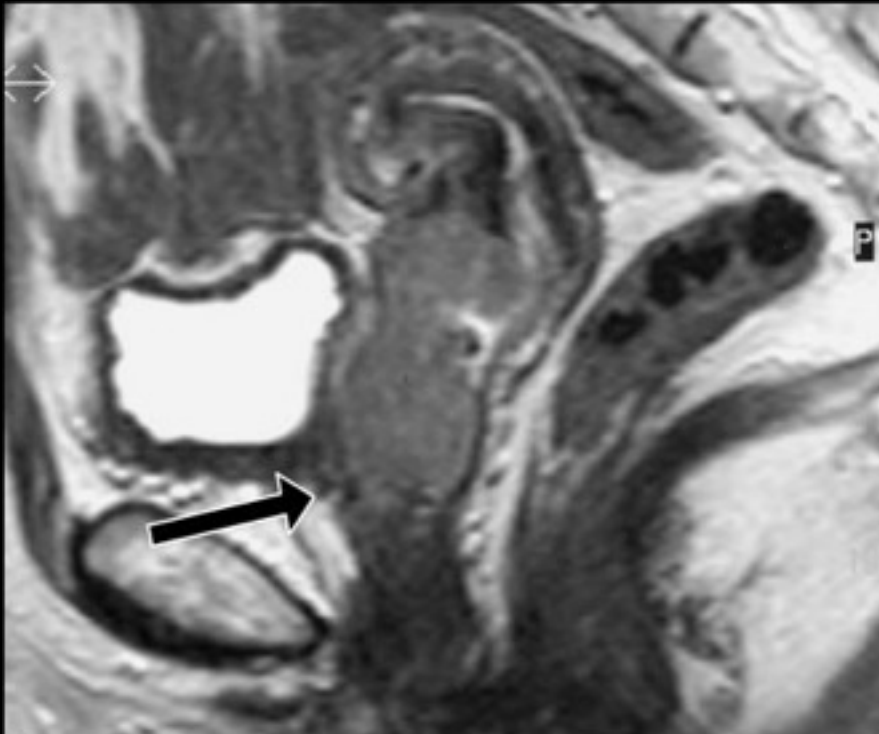
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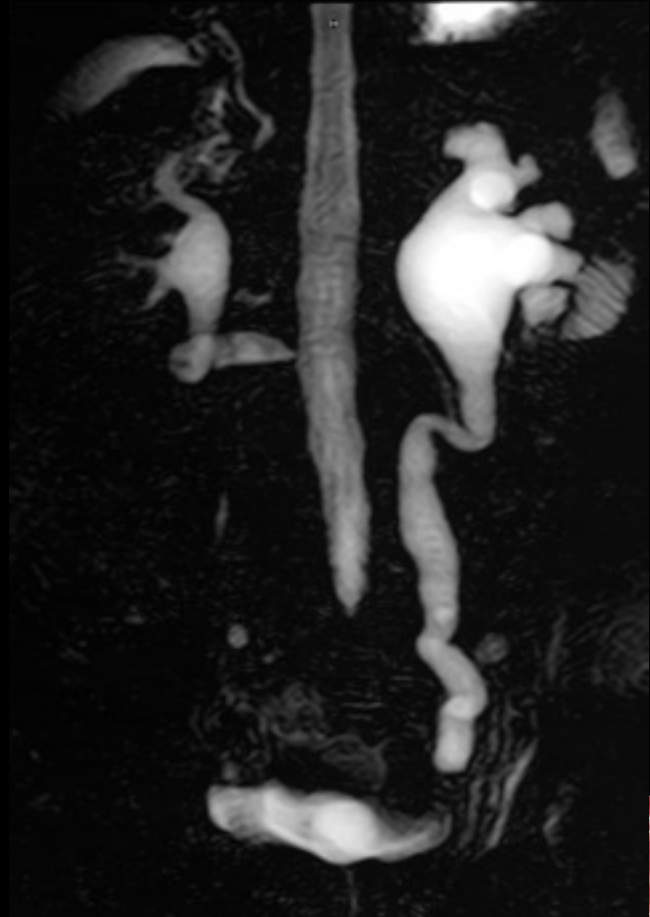
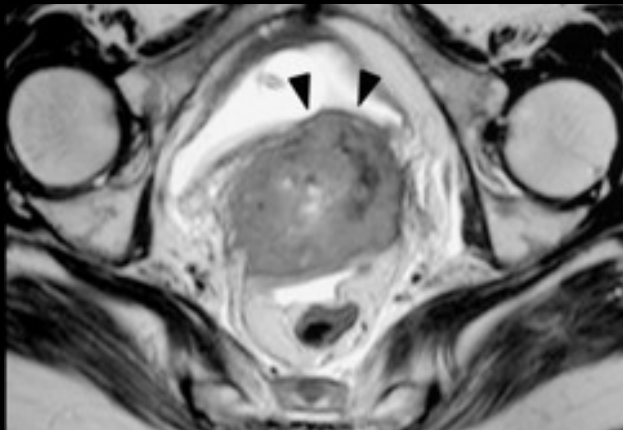
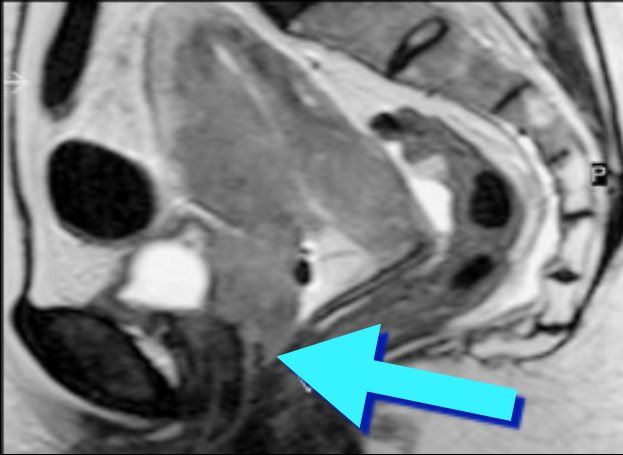
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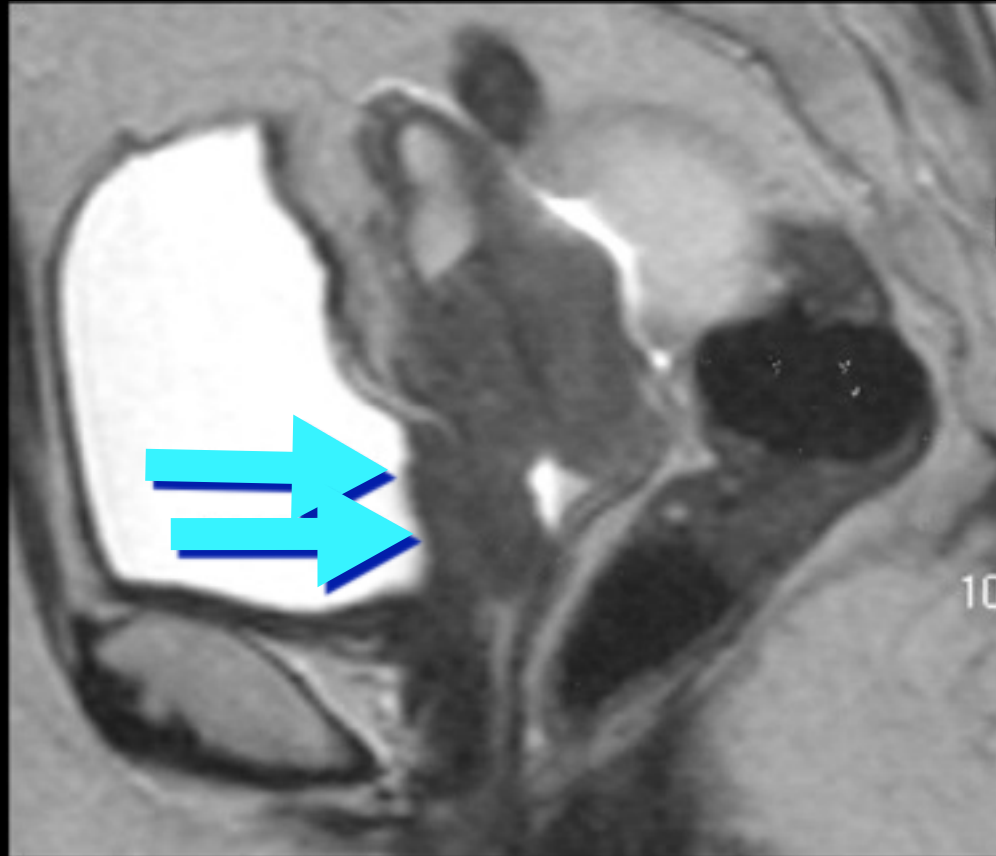


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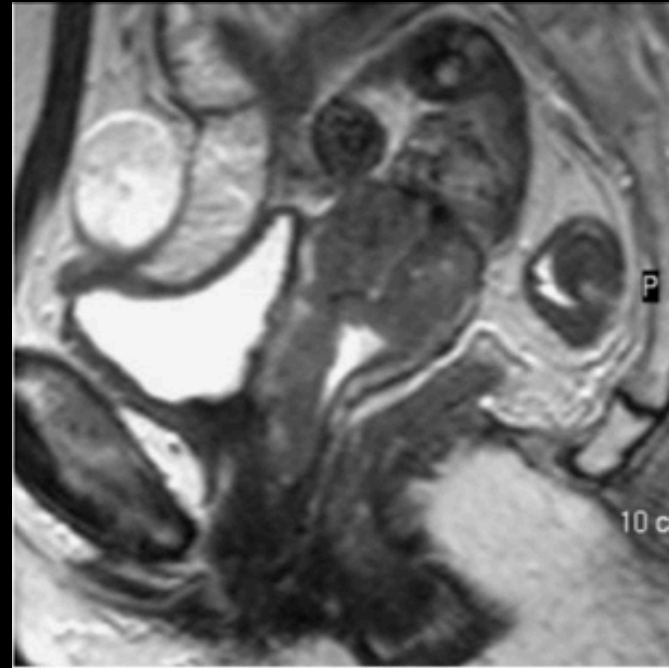
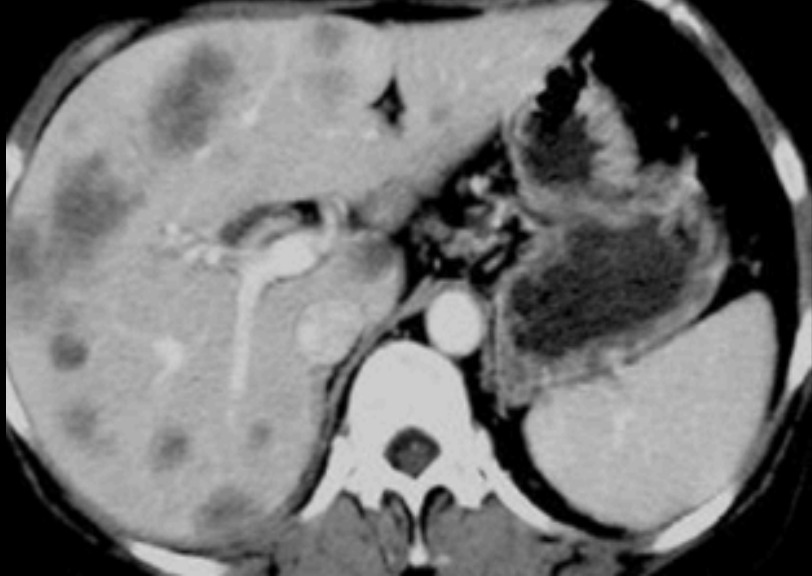




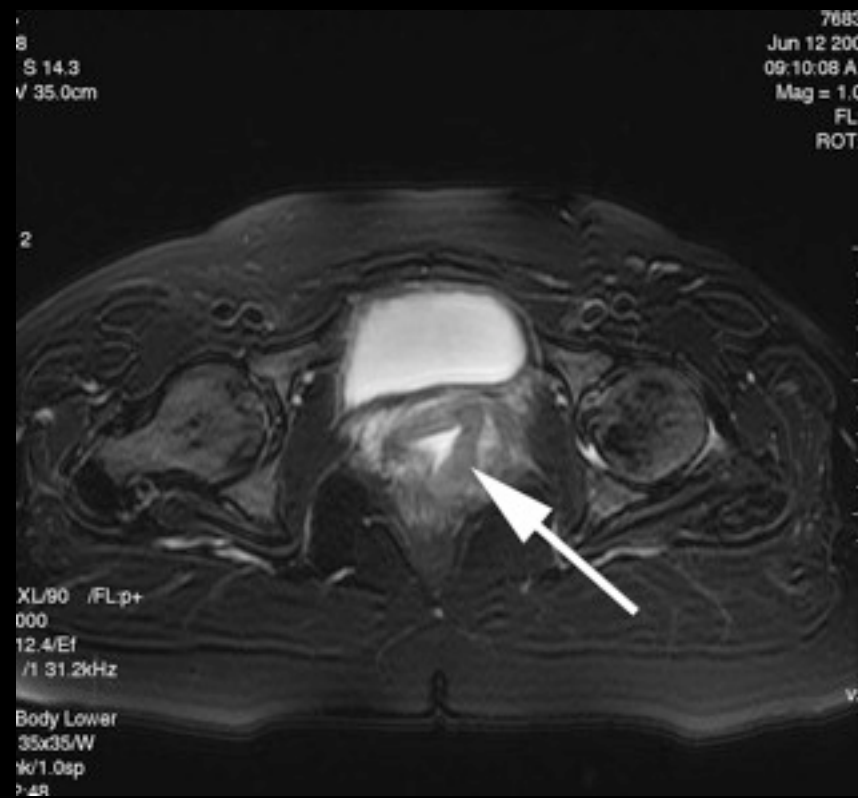
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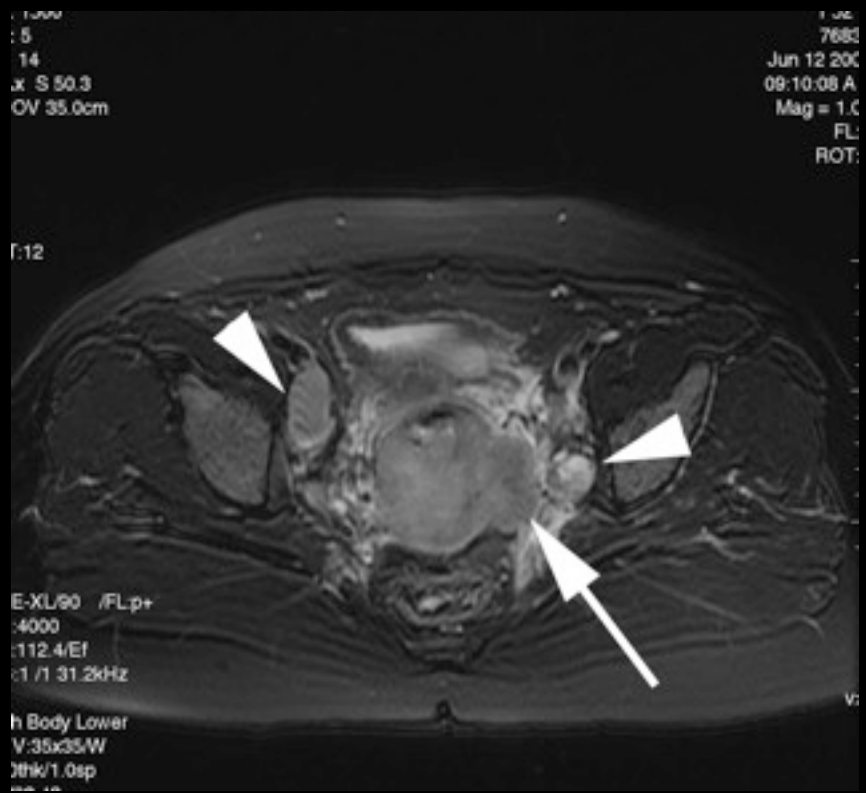


# IVB



# IIIB





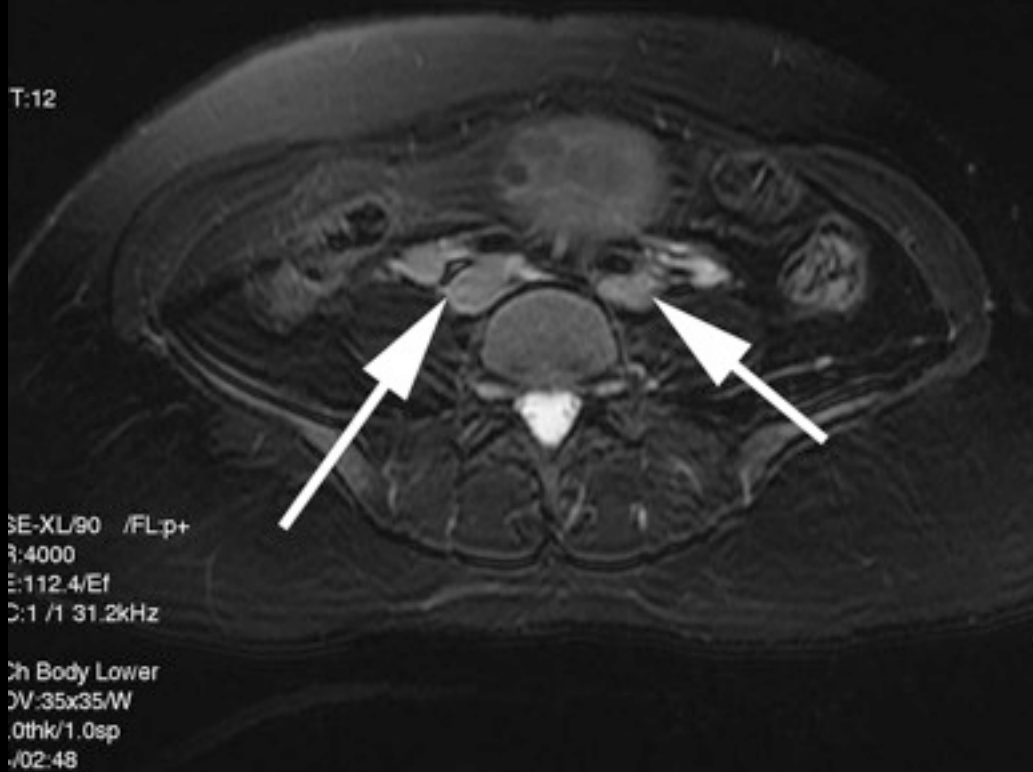
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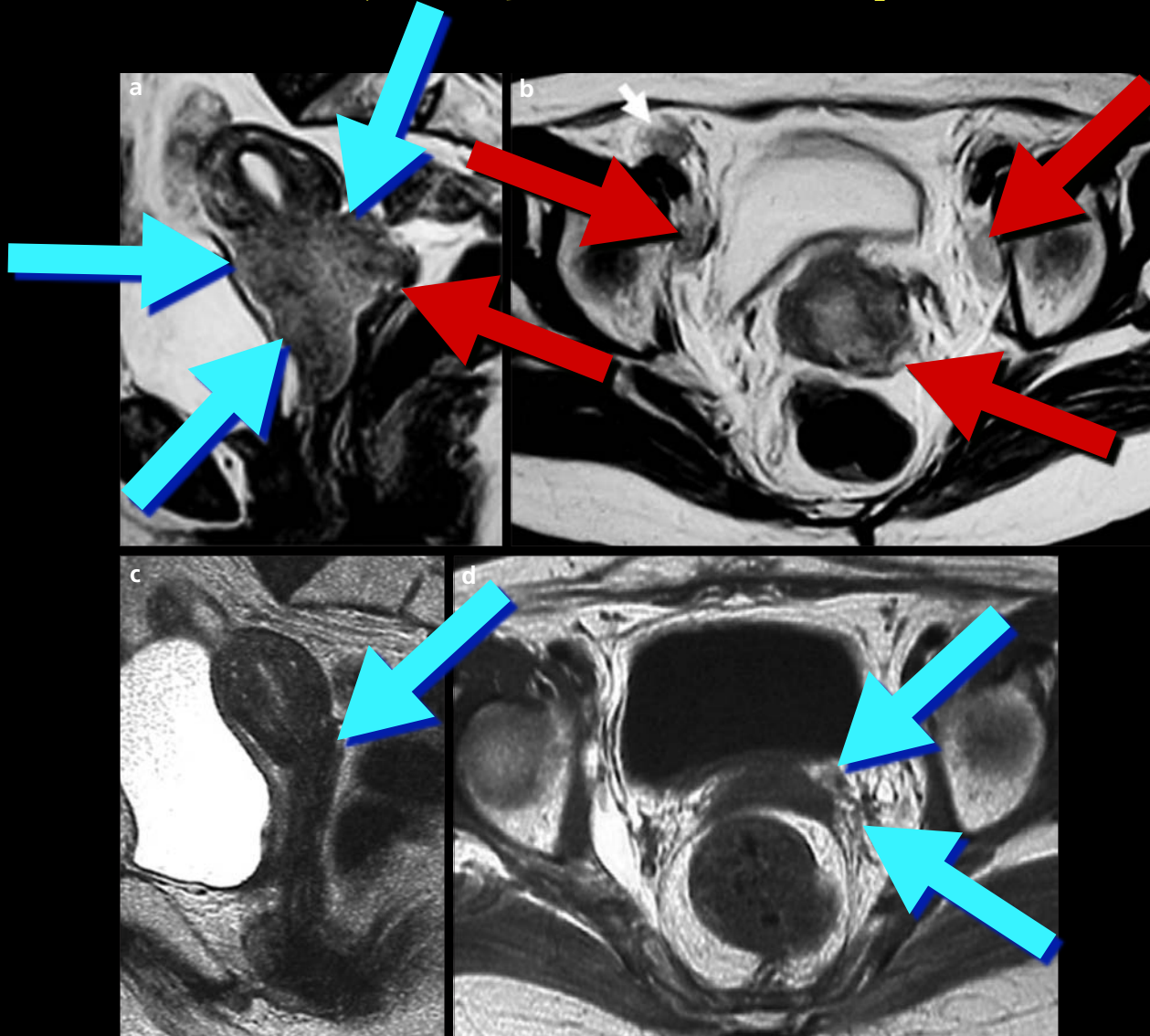
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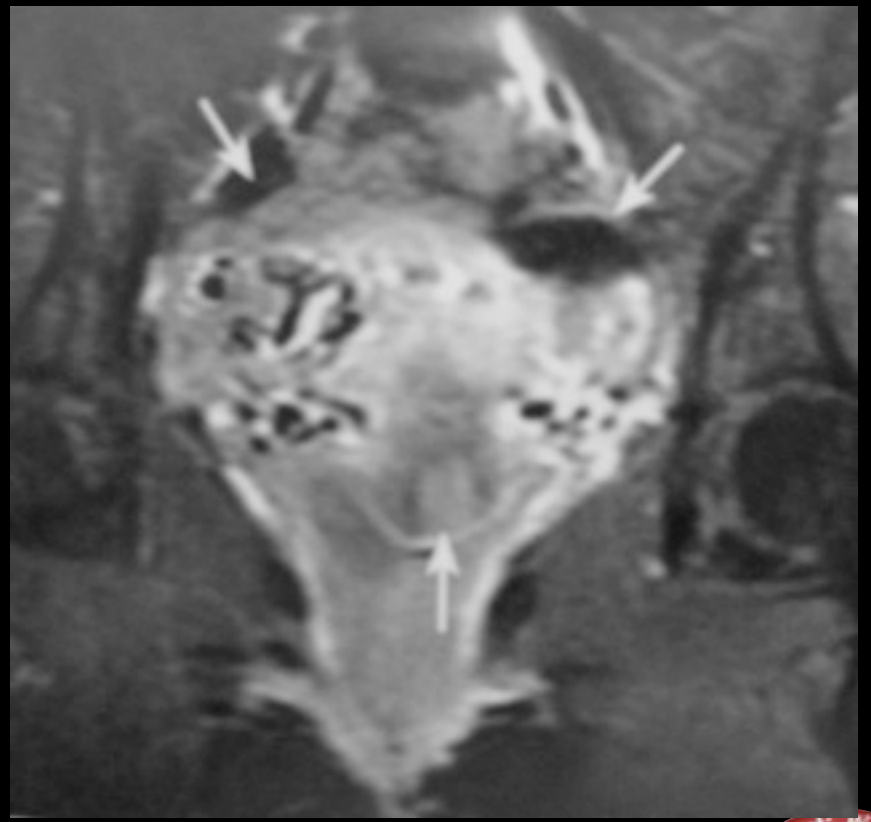
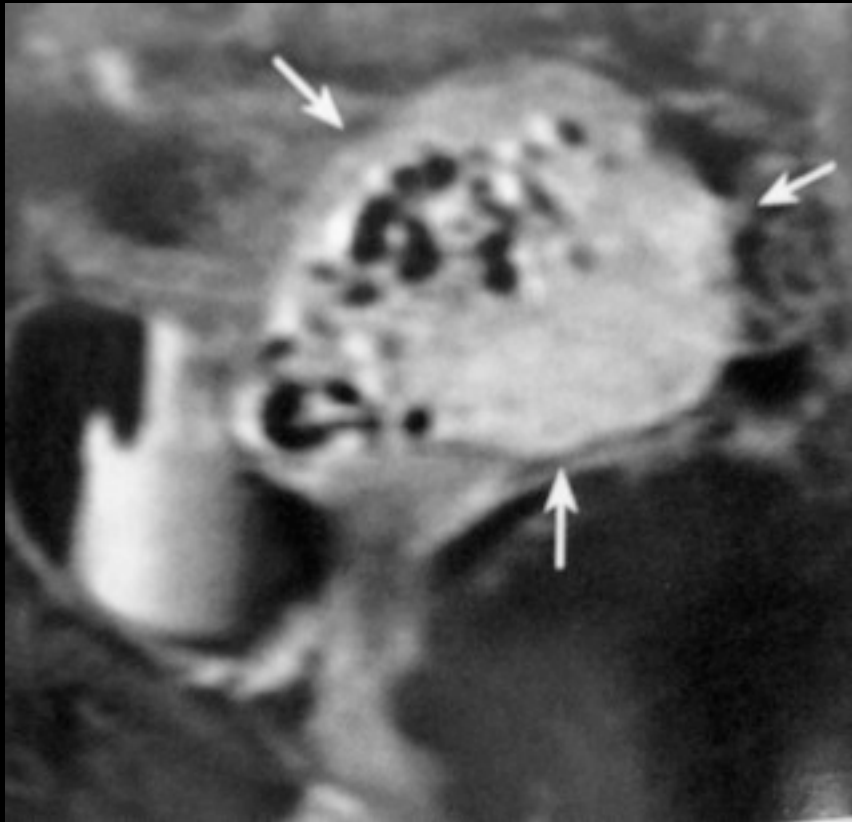
# 放疗后变化



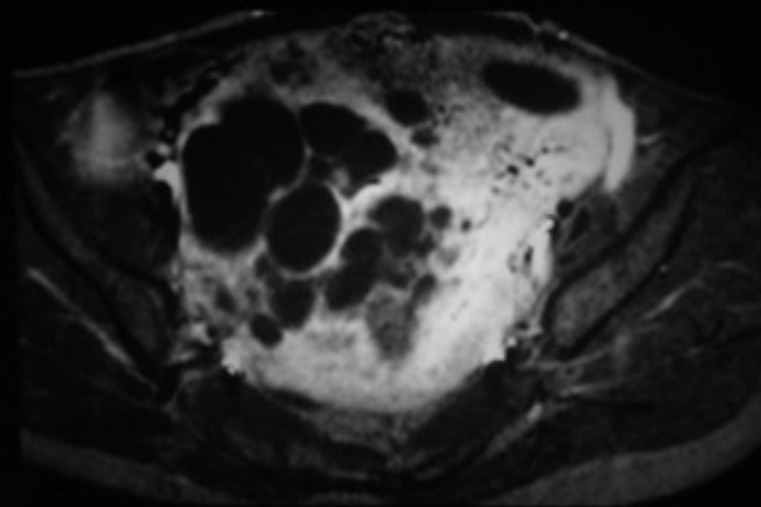
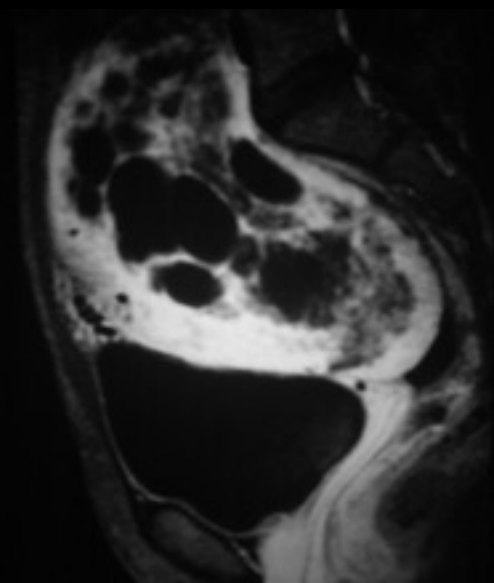
# 妊娠滋养细胞的肿瘤

- 葡萄胎、恶性葡萄胎和绒癌
- MR
  - 良性：胎盘边界不清，弥漫性T2高信号
  - 恶性：T1等信号或出血，T2不均匀高信号，边界不清，有迂曲增粗的血管
  - 治疗后随访有用









# 总结

- 盆腔MR具有良好的组织对比，可以对疾病进行很好的定性
- 女性盆腔脏器的表现应结合激素水平进行评估
- 对盆腔恶性肿瘤的准确分期是MR检查的最主要优势





# 谢谢

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2011-5-22