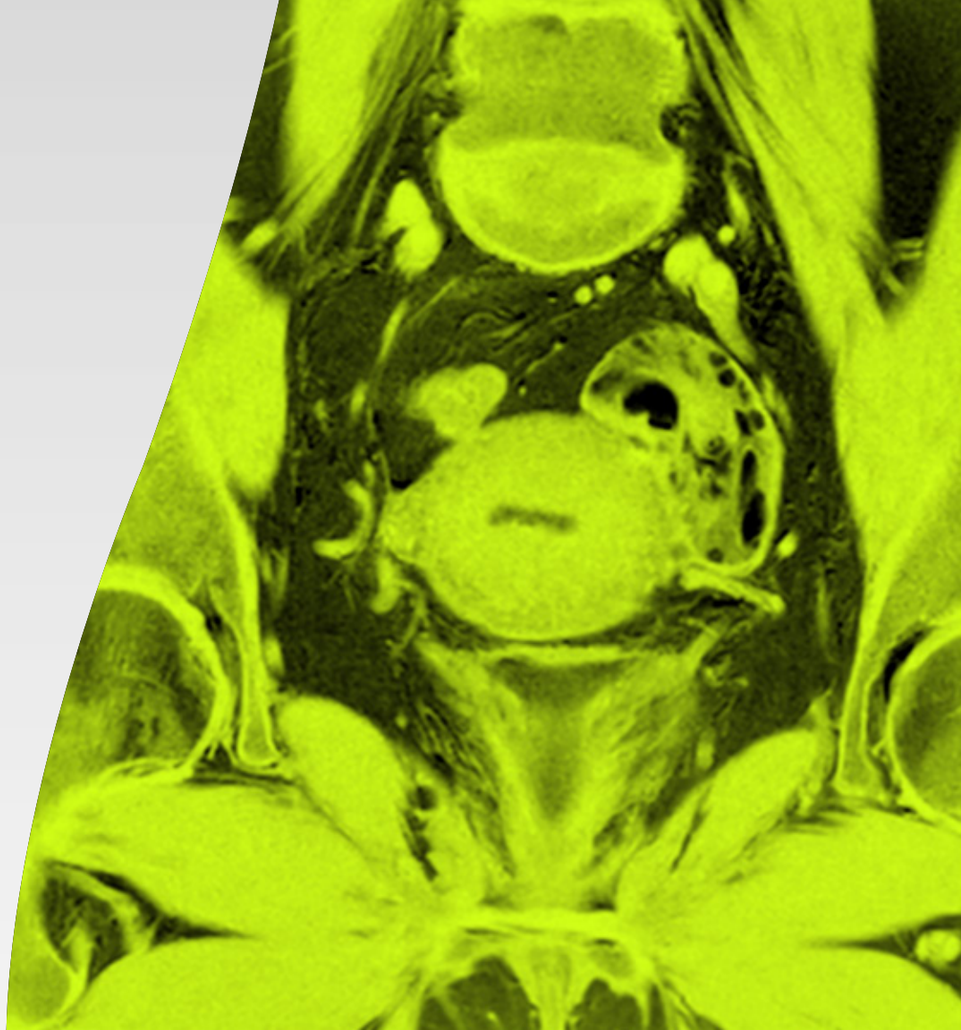
MODERN RADIOLOGY eBook

Imaging of the Female Pelvis

女性盆腔影像学



EUROPEAN SOCIETY OF RADIOLOGY

Preface

Modern Radiology is a free educational resource for radiology published online by the European Society of Radiology (ESR). The title of this second, rebranded version reflects the novel didactic concept of the ***ESR eBook*** with its unique blend of text, images, and schematics in the form of succinct pages, supplemented by clinical imaging cases, Q&A sections and hyperlinks allowing to switch quickly between the different sections of organ-based and more technical chapters, summaries and references.

Its chapters are based on the contributions of over 100 recognised European experts, referring to both general technical and organ-based clinical imaging topics. The new graphical look showing Asklepios with fashionable glasses, symbolises the combination of classical medical teaching with contemporary style education.

Although the initial version of the ***ESR eBook*** was created to provide basic knowledge for medical students and teachers of undergraduate courses, it has gradually expanded its scope to include more advanced knowledge for readers who wish to 'dig deeper'. As a result, *Modern Radiology* covers also topics of the postgraduate levels of the *European Training Curriculum for Radiology*, thus addressing postgraduate educational needs of residents. In addition, it reflects feedback from medical professionals worldwide who wish to update their knowledge in specific areas of medical imaging and who have already appreciated the depth and clarity of the ***ESR eBook*** across the basic and more advanced educational levels.

I would like to express my heartfelt thanks to all authors who contributed their time and expertise to this voluntary, non-profit endeavour as well as Carlo Catalano, Andrea Laghi and András Palkó, who had the initial idea to create an ***ESR eBook***, and - finally - to the ESR Office for their technical and administrative support.

Modern Radiology embodies a collaborative spirit and unwavering commitment to this fascinating medical discipline which is indispensable for modern patient care. I hope that this ***educational*** tool may encourage curiosity and critical thinking, contributing to the appreciation of the art and science of radiology across Europe and beyond.

Minerva Becker, Editor
Professor of Radiology, University of Geneva, Switzerland

Imaging of the Female Pelvis

CHAPTER OUTLINE:

女性盆腔影像学

章节大纲：

前言

*《现代放射学》*是由欧洲放射学协会 (European Society of Radiology, ESR) 在线发布的免费放射学教育资源。第二版（更名版）标题反映了 ***ESR 电子书***新颖的教学概念，它以简洁页面的形式巧妙地融合文本、图像和示意图，并辅以临床影像学案例、问答部分和内容超链接，使读者能够在各基于器官的部分、更具技术性的章节、摘要以及参考文献之间快速切换浏览。

其章节以 100 多名公认欧洲专家的优秀稿件为根基，涉及各类一般技术和基于器官的临床影像学主题。同时采用了全新的图形外观，展示了佩戴时尚眼镜的 Asklepios，象征着传统医学教学与现代风格教育的结合。

虽然初版 ***ESR 电子书***旨在为医学生和本科生教师提供医学基础知识，但现已逐渐扩充其知识领域，为希望“深入挖掘”的读者提供了更多高阶技术知识。因此，*《现代放射学》*还涵盖了*欧洲放射学培训课程*研究生水平的各类主题，旨在解决住院医师的研究生教育需求。此外，书中还囊括了全球医疗专业人士的反馈，他们希望更新自己在医学影像特定领域的知识，并对 ***ESR 电子书***在基础和高等教育水平上的深度和清晰度表示高度赞赏。

我要衷心感谢所有为这项非营利活动自愿贡献时间和专业知识的作者，以及最初提出创作 ***ESR 电子书***的 Carlo Catalano、Andrea Laghi 和 András Palkó，最后还要感谢 ESR 办公室所提供的技术和行政支持。

*《现代放射学》*充分体现了医者的协作精神和对这门热门医学学科坚定不移的承诺，这是现代患者护理必须具备的优秀精神品质。我希望这款***教育***工具能够激励各位始终保持好奇心和批判性思维，从而促进整个欧洲乃至欧洲以外地区对放射学艺术和科学的认识。

Minerva Becker，编辑
瑞士日内瓦大学放射学教授

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CHAPTER OUTLINE:

章节大纲：

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This is a translation of the Chapter of the **Modern Radiology eBook.**

ORIGINAL TITLE:
Imaging of the Female Pelvis

TRANSLATED BY:
Prof. Huadan Xue, Peking Union Medical College Hospital, Chinese Academy of Medical Sciences
Prof. Jiejun Cheng, Shanghai First Maternity and Infant Hospital

COORDINATED BY:
Prof. Shiyuan Liu, Shanghai Changzheng Hospital
Prof. Yi Xiao, Shanghai Changzheng Hospital

ENDORSED BY:
Chinese Society of Radiology

NOTE FROM THE COORDINATORS:
Thank you to Chinese radiology experts for bridging languages and open the world-class English resource by ESR to every Mandarin-speaking student, fueling global radiology talent with a single click

bjdanna95@163.com
drchjj@163.com

翻译致谢

CHAPTER OUTLINE:

章节大纲：

本章节为《现代放射学电子书》的部分译文。

原文标题：
女性盆腔影像学

翻译：
薛华丹教授，中国医学科学院北京协和医院
程杰军教授，上海市第一妇婴保健院

联合翻译：
刘士远教授，长征医院
萧毅教授，长征医院

审定：
中华医学会放射学分会

译者寄语：
感谢中国放射学专家们的倾力奉献！你们跨越了语言的鸿沟，将欧洲放射学会 (ESR) 的世界级学术宝库呈献给广大中文学子。如今，前沿智慧一键即达，为全球放射学人才的蓬勃发展注入了强劲动力。

bjdanna95@163.com
drchjj@163.com

Signage

<▪> CORE KNOWLEDGE

<!> ATTENTION

<↑> HYPERLINKS

>▪< FURTHER KNOWLEDGE

>|< COMPARE

<∞> REFERENCES

<?> QUESTIONS

Imaging of the Female Pelvis

女性盆腔影像学

导示

CHAPTER OUTLINE:

章节大纲：

<▪> 核心知识

<!> 注意

<↑> 超链接

>▪< 进阶知识

>|< 比较

<∞> 参考文献

<?> 问题

MODERN RADIOLOGY eBook

Based on the ESR Curriculum for Radiological Education

Imaging of the Female Pelvis

AUTHORS

Reza Dehdab | Haidara Almansour | Saif Afat

AFFILIATION

Department of Diagnostic and Interventional Radiology, Hoppe-Seyler-Strasse 3, Eberhard Karls University Tuebingen, Tuebingen, Germany

<↑> HYPERLINK

reza.dehdab@med.uni-tuebingen.de
haidara.al-mansour@med.uni-tuebingen.de
saif.afat@med.uni-tuebingen.de

Imaging of the Female Pelvis

女性盆腔影像学

基于 ESR 课程的放射学教育

CHAPTER OUTLINE:

女性骨盆影像学

作者

Reza Dehdab | Haidara Almansour | Saif Afat

所属机构

图宾根埃伯哈德·卡尔斯大学诊断和介入放射科，Hoppe-Seyler-Strasse 3，德国图宾根

<↑> 超链接

reza.dehdab@med.uni-tuebingen.de
haidara.al-mansour@med.uni-tuebingen.de
saif.afat@med.uni-tuebingen.de

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- Anatomy and Anatomical Variants
- Diagnostic Imaging Techniques
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  - Computed Tomography
  - Magnetic Resonance Imaging
- Diseases of Female Reproductive Organs
  - Benign Pathology
    - Ovarian Cysts
    - Uterine Fibroids
    - Endometriosis
    - Ovarian Torsion
  - Malignant Pathology
    - Endometrial Cancer
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- Test Your Knowledge

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- 影像诊断技术
  - 超声
  - 计算机断层扫描
  - 磁共振成像
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  - 胎盘异常
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- 核心要点
- 参考文献
- 知识测试

Anatomy and Anatomical Variants

CHAPTER OUTLINE:

章节大纲：

解剖学和解剖结构变异

/ Anatomy

The female pelvis is an anatomically complex structure, housing the reproductive and some parts of the urinary system. The changes it undergoes throughout life, especially during pregnancy, make it a focal point of medical imaging.

The female reproductive system consists of:

- Ovaries: Produce and store eggs (ova)
- Fallopian tubes: Transport eggs from the ovaries to the uterus
- Uterus: Site for fetal development during pregnancy
- Cervix: Connects the uterus to the vagina
- Vagina: Birth canal

The pelvic organs are surrounded by the peritoneum. Anterior to the uterus, the peritoneal cavity extends between the uterine isthmus and the posterior bladder wall to form the vesicouterine pouch. The rectouterine pouch, called also the cul-de-sac or pouch of Douglas, is the extension of the peritoneal cavity between the rectum and the cervix and posterior uterine wall.

/ **Imaging** of the Female **Pelvis**

/ 女性**盆腔**影像学

/ 解剖结构

CHAPTER OUTLINE:

章节大纲：

女性盆腔是一个解剖结构复杂的结构，容纳了生殖系统和部分泌尿系统的器官。它在一生中发生的变化，尤其是在怀孕期间的变化，使其成为医学成像的焦点。

女性生殖系统包括：

- 卵巢：生产和储存卵子
- 输卵管：将卵子从卵巢输送到子宫
- 子宫：妊娠期胎儿发育之处
- 子宫颈：连接子宫和阴道
- 阴道：产道

盆腔器官被腹膜包围。在子宫前方，腹膜腔在子宫峡部和膀胱后壁之间延伸，形成膀胱子宫陷凹。直肠子宫陷凹又称道格拉斯陷凹或道格拉斯窝，是直肠与宫颈和子宫后壁之间的腹膜腔延伸部分。

/ Ovaries

Anatomy: The ovaries are bilateral, almond-shaped organs situated laterally in the pelvic cavity and measure approximately 1.5-3.0 cm × 1.5-3.0 cm × 1.0-2.0 cm (length x width x thickness) (corresponding to a volume of 1.2-9.4 cm3). Each ovary is divided into:

- **Medulla:** The central part containing blood vessels, lymphatic vessels, and nerves
- **Cortex:** The outer layer where oogenesis occurs, containing various stages of ovarian follicles
- **Germinal epithelium:** The outermost layer
- **Tunica albuginea:** A dense connective tissue layer beneath the germinal epithelium

Function: The ovaries are responsible for oogenesis (production of ova or eggs) and hormone production, including estrogen and progesterone, which play vital roles in the menstrual cycle, pregnancy, and secondary sexual characteristics.

Physiology: The primary structures are the follicles, ranging from primordial to mature Graafian follicles. The ovarian stroma supports these follicles and contains interstitial cells which produce hormones.

/ 卵巢

CHAPTER OUTLINE:

章节大纲：

解剖结构：卵巢为双侧杏仁状器官，位于盆腔两侧，大小约为1.5～3.0 cm×1.5～3.0 cm×1.0～2.0 cm（长×宽×厚）（对应体积为1.2～9.4 cm^3）。每个卵巢分为：

- **髓质：**中央部分，包含血管、淋巴管和神经
- **皮质：**外层，卵子发生部位，包含不同发育阶段的卵泡
- **生发上皮：**最外层
- **白膜：**生发上皮下方的致密结缔组织层

功能：卵巢负责卵子发生（产生卵细胞或卵子）和激素分泌，包括雌激素和孕激素，这些激素在月经周期、妊娠及第二性征形成中起着至关重要的作用。

生理：主要结构为卵泡，从原始卵泡到成熟的格拉夫卵泡不等。卵巢基质支持这些卵泡，并含有产生激素的间质细胞。

Blood Supply

- **Ovarian Arteries:**
  Directly arise from the abdominal aorta, usually inferior to the renal arteries.
  The ovarian arteries travel within the suspensory ligament of the ovary, called the infundibulopelvic ligament, to reach the ovaries.

- **Uterine Arteries:**
  Arise from the internal iliac arteries. A part of the blood from the uterine arteries also supplies the ovaries via anastomoses with the branches of the ovarian arteries. This ensures a rich vascular network, facilitating hormonal transportation and follicular development.

- **Venous Drainage:**
  - **Ovarian Veins:** These veins are responsible for venous drainage of the ovaries. The right ovarian vein usually drains directly into the inferior vena cava, whereas the left ovarian vein typically drains into the left renal vein.

Lymphatic Drainage:

- **Para-aortic Lymph Nodes:**
  The majority of the lymphatic drainage from the ovaries flows to the para-aortic or lumbar lymph nodes, which are located alongside the abdominal aorta. This is crucial in the context of ovarian cancers, as these nodes are frequently assessed for metastatic spread.

- **Pelvic Lymph Nodes:**
  A small portion of lymph from the ovaries may also drain to pelvic lymph nodes. However, this is a less common pathway compared to the para-aortic nodes.

血供

- **卵巢动脉：**
  直接起自腹主动脉，通常位于肾动脉下方。
  卵巢动脉在卵巢悬韧带（骨盆漏斗韧带）内走行，到达卵巢。

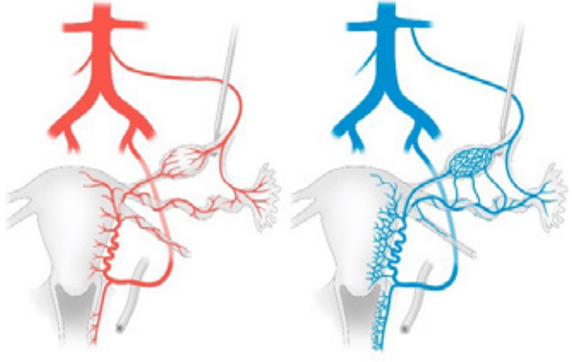
- **子宫动脉：**
  起自髂内动脉。子宫动脉的部分血液也通过与卵巢动脉分支的吻合支供应卵巢。这确保了丰富的血管网络，有助于激素转运和卵泡发育。

- **静脉引流：**
  - **卵巢静脉：**这些静脉负责卵巢的静脉引流。右侧卵巢静脉通常直接汇入下腔静脉，而左侧卵巢静脉通常汇入左肾静脉。

淋巴引流：

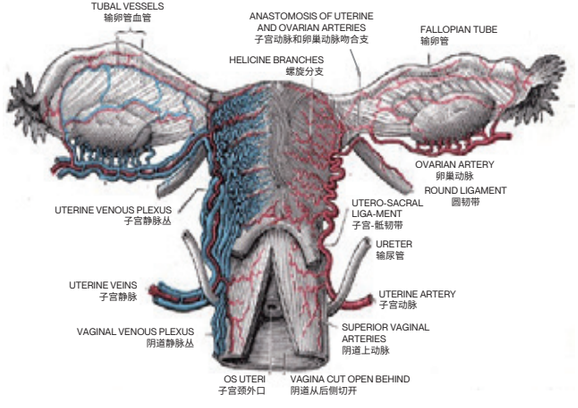
- **主动脉旁淋巴结：**
  卵巢的大部分淋巴引流汇入腹主动脉旁的主动脉旁或腰淋巴结。这在卵巢癌诊疗中至关重要，因为通常会评估这些淋巴结的转移扩散情况。

- **盆腔淋巴结：**
  卵巢的一小部分淋巴也可能引流至盆腔淋巴结。然而，与主动脉旁淋巴结相比，这是一条较不常见的引流途径。



Female reproductive system blood supply

Reproduced from: Freytag D. et al. Challenges Posed by Embryonic and Anatomical Factors in Systematic Lymphadenectomy for Endometrial Cancer. J. Clin. Med. 2020, 9, 4107. https://doi.org/10.3390/jcm9124107



Female reproductive system anatomy and blood supply: Tubal vessels, anastomosis of uterine and ovarian arteries, helicine branches, Fallopian tub, ovarian artery, uterine venous plexus, uterosacral ligament, ureter, uterine artery and veins, superior vaginal arteries, vaginal venous plexus, os uteri.

Reproduced from: Henry Gray (1918) Anatomy of the Human Body, Bartleby.com: Gray's Anatomy, Illustration 589

Imaging of the Female **Pelvis**

女性**盆腔**影像学

CHAPTER OUTLINE:

章节大纲：

女性生殖系统的血供

来源：Freytag D. et al. Challenges Posed by Embryonic and Anatomical Factors in Systematic Lymphadenectomy for Endometrial Cancer. J. Clin. Med. 2020, 9, 4107. https://doi.org/10.3390/jcm9124107

女性生殖系统解剖及血供：输卵管血管、子宫动脉与卵巢动脉吻合支、螺旋支、输卵管、卵巢动脉、子宫静脉丛、子宫骶韧带、输尿管、子宫动静脉、阴道上动脉、阴道静脉丛、子宫颈外口。

来源：Henry Gray (1918) Anatomy of the Human Body，Bartleby.com：格雷氏解剖学，插图 589

/ Changes Over Time

Postmenopausal Ovaries:

- Decrease in size with age, often hard to detect on ultrasound.
- Visualised in about 96% of premenopausal cases, but only 63.5% of postmenopausal cases.

Premenarchal Ovaries:

- Best viewed transabdominally or transrectally before puberty.
- Display as small structures, with early signs of folliculogenesis evident as puberty nears.
- During adolescence, there's a diverse growth of follicles; sometimes mistaken for polycystic ovaries.

Reproductive Age Ovaries:

- Morphological changes occur due to hormone fluctuations.
- Newborns have around two million follicles; only a fraction mature and ovulate during a woman's life.
- From the fifth to the seventh day of the menstrual cycle, secondary antral follicles are visible. One dominant follicle typically emerges during the cycle.

Anatomical Variants:

- **Accessory Ovary:** A rare occurrence of an additional smaller ovary.
- **Ectopic Ovary:** An ovary located outside its typical position.

Imaging of the Female Pelvis

女性盆腔影像学

/ 随时间的变化

CHAPTER OUTLINE:

章节大纲：

绝经后卵巢：

- 体积随年龄增长而缩小，超声通常难以检测到。
- 在约 96% 的绝经前女性中可见，但绝经后女性中仅 63.5% 可见。

初潮前卵巢：

- 青春期前经腹或经直肠观察最佳。
- 表现为小结构，青春期临近时有明显的卵泡生成早期迹象。
- 在青春期，卵泡呈现多样化生长；有时会被误认为是多囊卵巢。

育龄期卵巢：

- 因激素波动发生形态学变化。
- 新生儿卵巢约有 200 万个卵泡；女性一生中仅有小部分卵泡成熟并排卵。
- 月经周期的第 5~7 天可见次级窦卵泡。每个周期通常有一个优势卵泡形成。

解剖结构变异：

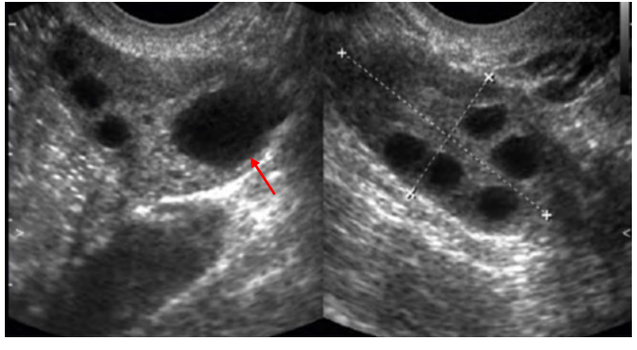
- **副卵巢：**一种罕见的额外小卵巢。
- **异位卵巢：**位于典型位置以外的卵巢。

/ Radiological Features

Radiological Features: On ultrasound, the ovaries appear as elliptical structures with an echogenic stroma. During the early menstrual cycle, multiple anechoic follicles can be seen.

Normal ovary of a healthy woman, aged 21 years in the early proliferative phase. Several follicles of 4-6 mm are located along its perimeter

Reproduced from: Abdullaiev R Ya et al. (05 2018). EC GYNAECOLOGY Research Article Transvaginal Echography in Assessing of Structures and Functional Changes in Polycystic Ovaries



Normal ovaries. In the middle proliferative phase, the ripening follicle is visualised in the right ovary (red arrow)

Reproduced from: Abdullaiev R Ya et al. (05 2018). EC GYNAECOLOGY Research Article Transvaginal Echography in Assessing of Structures and Functional Changes in Polycystic Ovaries

/ 影像学特征

CHAPTER OUTLINE:

影像学特征：超声检查中，卵巢表现为具有高回声基质的椭圆形结构。月经周期早期可见多个无回声卵泡。

21 岁健康女性的正常卵巢，处于增殖期早期，其周边可见数个 4～6 mm 的卵泡

来源：Abdullaiev R Ya et al. (05 2018). EC GYNAECOLOGY Research Article Transvaginal Echography in Assessing of Structures and Functional Changes in Polycystic Ovaries

正常卵巢。在增殖期中期，右侧卵巢可见成熟卵泡（红色箭头）

来源：Abdullaiev R Ya et al. (05 2018). EC GYNAECOLOGY Research Article Transvaginal Echography in Assessing of Structures and Functional Changes in Polycystic Ovaries

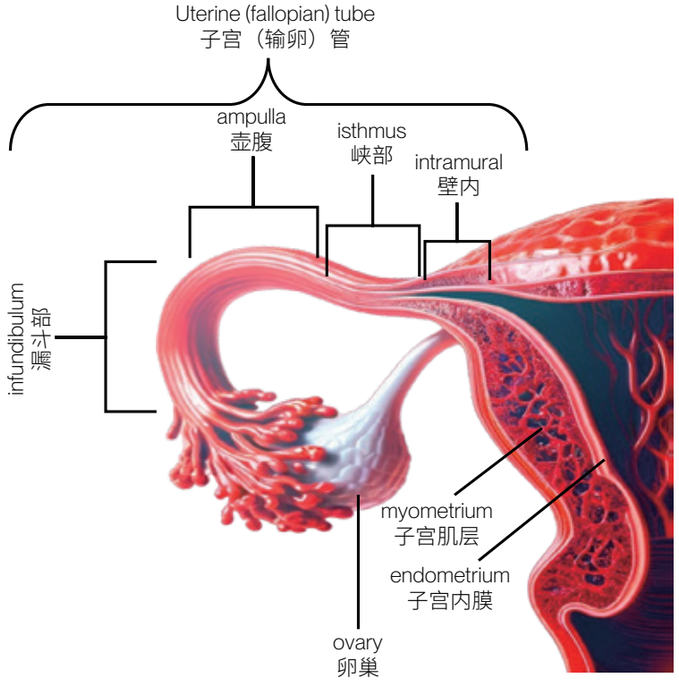
/ Fallopian Tubes

Anatomy: The fallopian tubes are bilateral tubular structures connecting the ovaries and uterus. They're divided into:

- **Infundibulum:** The funnel-shaped segment with fimbriae
- **Ampulla:** The longest segment
- **Isthmus:** The thicker-walled segment closer to the uterus
- **Interstitial part:** Located within the uterine wall

Function: The fallopian tubes transport mature ova from the ovaries to the uterus. They are also the site where fertilisation commonly takes place if spermatozoa are present.

Blood supply to the fallopian tubes is derived from branches of both the ovarian and uterine arteries. The blood drainage from the fallopian tubes is via the corresponding veins, i.e., the ovarian and uterine veins.



Anatomy of the Fallopian Tube

CHAPTER OUTLINE:

章节大纲：

/ 输卵管

解剖结构：输卵管是连接卵巢和子宫的双侧管状结构，可分为：

- **漏斗部：**呈漏斗状，末端有输卵管伞
- **壶腹部：**最长的一段
- **峡部：**靠近子宫的厚壁部分
- **间质部：**位于子宫壁内

功能：输卵管将成熟的卵子从卵巢输送到子宫。如果存在精子，输卵管也是受精的常见部位。

输卵管的**血液供应**来自卵巢动脉和子宫动脉的分支。输卵管的血液回流通过相应的静脉进行，即卵巢静脉和子宫静脉。

输卵管的解剖结构

/ Radiological Features

Anatomical Variants:

- **Duplicate tubes:** Rare duplication of a section or the entirety of the tube.
- **Congenital absence:** Absence of one or both tubes.

Radiological features: Generally not distinctly visualised under ultrasound unless pathology like hydrosalpinx or ectopic pregnancy is suspected (see later).

Hysterosalpingography (HSG) is an X-ray imaging technique to assess fallopian tube patency and to outline the internal shape of the uterus. In HSG a thin tube is inserted into the vagina and cervix and contrast material is injected into the uterus.

In a normal HSG, the uterine cavity is well-defined, and the contrast fills both fallopian tubes and spills into the peritoneal cavity, indicating tubal patency.

Normal hysterosalpingogram (HSG), with bilateral intraperitoneal spill of contrast. No filling defects. Case courtesy of Mohammad Taghi Niknejad, Radiopaedia.org, rID: 93384

CHAPTER OUTLINE:

章节大纲：

/ 影像学特征

解剖结构变异：

- **双输卵管：**罕见的输卵管节段性或完全性重复。
- **先天性缺失：**单侧或双侧输卵管缺失。

影像学特征：通常在超声下无法清晰显示，除非怀疑存在输卵管积水或异位妊娠等病理情况（见后文）。

子宫输卵管造影（Hysterosalpingography，HSG）是一种 X 线成像技术，可评估输卵管的通畅性并勾勒子宫内部形态。在 HSG 中，将一根细管插入阴道和宫颈，并将对比剂注入子宫。

正常 HSG 中，宫腔边界清晰，对比剂充满双侧输卵管并溢出进入腹膜腔，表明输卵管通畅。

正常子宫输卵管造影 (HSG)，双侧腹腔内有对比剂溢出。无充盈缺损。病例来源：Mohammad Taghi Niknejad，Radiopaedia.org，rID：93384

/ Uterus

Anatomy: The uterus is a pear-shaped muscular organ positioned anterior to the rectum and posterior to the bladder. In non-pregnant females, it lies mostly within the pelvic cavity. In non-pregnant women, it typically measures about 7.5 cm in length, 5 cm in breadth at its upper part, and nearly 2.5 cm in thickness. It's divided into:

- **Fundus:** The top portion
- **Body or Corpus:** The central segment
- **Cervix:** The lower portion projecting into the vagina
- **The uterine corpus is composed of three layers:**
- **Endometrium:** The inner mucosal layer, which undergoes cyclic changes during the menstrual cycle and is shed during menstruation
- **Myometrium:** The thick, muscular middle layer responsible for uterine contractions during menstruation and childbirth
- **Perimetrium (or Serosa):** The outermost thin Peritoneal layer covering the uterus

Physiology: Estrogen causes proliferation of the endometrial lining, while progesterone prepares it for potential implantation. If pregnancy doesn't occur, a drop in these hormone levels leads to menstruation.

Function: The uterus houses and nourishes the developing fetus during pregnancy. During menstrual cycles, its inner lining (endometrium) thickens in preparation for a potential implantation of an embryo.

Blood Supply:

- **Uterine Arteries:** These arise from the internal iliac arteries and provide the primary blood supply
- **Ovarian Arteries:** They also contribute to the blood supply, especially to the lateral part of the uterus

Lymphatic Drainage:

Lymph from the uterus primarily drains into the internal and external iliac lymph nodes, as well as the sacral and aortic lymph nodes.

CHAPTER OUTLINE:

章节大纲：

/ 子宫

解剖结构：子宫是一个梨形的肌性器官，位于直肠前方、膀胱后方。未妊娠女性的子宫大部分位于盆腔内。未妊娠女性的子宫通常长约 7.5 cm，上部宽约 5 cm，厚近 2.5 cm。它可分为：

- **宫底：**顶部
- **宫体：**中央部分
- **子宫颈：**突入阴道的下部
- **子宫体由三层组成：**
- **子宫内膜：**内层黏膜层，在月经周期中发生周期性变化，并在月经期脱落
- **子宫肌层：**厚层肌性中间层，负责在月经和分娩时引起子宫收缩
- **子宫浆膜（或浆膜层）：**覆盖子宫的最外层薄腹膜层

生理：雌激素促使子宫内膜增殖，而孕激素使其为潜在的着床做准备。如果没有怀孕，这些激素水平的下降会导致月经来潮。

功能：子宫在怀孕期间容纳和滋养发育中的胎儿。在月经周期中，子宫内膜增厚，为可能的胚胎着床做准备。

血供：

- **子宫动脉：**这些动脉起自髂内动脉，是主要的血供来源
- **卵巢动脉：**也参与血液供应，尤其是供应子宫外侧部分

淋巴引流：

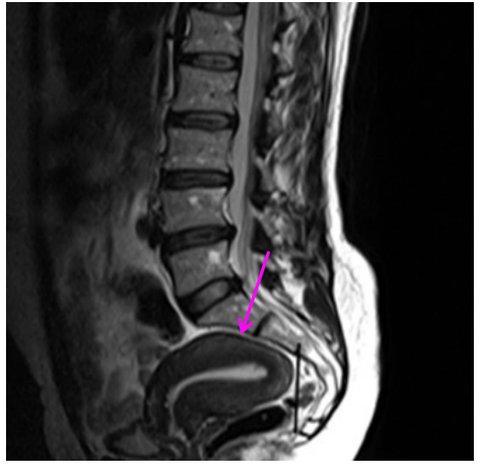
子宫的淋巴主要引流至髂内和髂外淋巴结，以及骶淋巴结和主动脉淋巴结。

/ Anatomical Variants and Anomalies

In the study of female pelvic radiology, understanding the diversity in the anatomy of the uterus is crucial. While there are numerous variants and anomalies, this section focuses on the most common ones. For a comprehensive understanding of less common conditions, readers are encouraged to refer to ASRM Müllerian anomalies classification [6].

Most Common Uterine Variants

- Anteverted Uterus
  Description: The most common uterine position, where the uterus tilts forward at the cervix.
  Clinical Implication: Generally, no symptoms.
- Retroverted Uterus
  Description: The uterus tilts backward at the cervix, also known as a "tipped uterus."
  Clinical Implication: Often asymptomatic, may cause discomfort during menstruation or intercourse in some cases.
- Retroflexed Uterus
  Description: A posteriorly oriented uterus with the body flexed backward on the cervix.
  Clinical Implication: Typically, a normal variant, sometimes with symptoms similar to a retroverted uterus.



MRI of the pelvis showing a retroverted (pink arrow) uterus

Reproduced from: Zidan MMA et al. Incidental extraspinal findings in the lumbar spine during magnetic resonance imaging of intervertebral discs. Heliyon. 2018;4(9):e00803. Published 2018 Sep 19. doi:10.1016/j.heliyon.2018.e00803

Imaging of the Female Pelvis

CHAPTER OUTLINE:

女性盆腔影像学

章节大纲：

/ 解剖变异与异常

在女性盆腔放射学研究中，了解子宫解剖结构的多样性至关重要。尽管存在众多变异和异常情况，本节将重点介绍最常见的类型。如需全面了解不太常见的情况，建议读者参考美国生殖医学学会 (ASRM) 苗勒管异常分类[6]。

最常见的子宫变异

- 子宫前倾
  描述：最常见的子宫位置，即子宫在宫颈处向前倾斜。
  临床意义：一般无症状。
- 子宫后倾
  描述：子宫在宫颈处向后倾斜，也称为“倾斜子宫”。
  临床意义：通常无症状，有时在月经期或性交时引起不适。
- 子宫后屈
  描述：子宫向后倾斜，宫体向后弯曲抵住宫颈。
  临床意义：通常为正常变异，有时可出现与后倾子宫相似的症状。

盆腔 MRI 显示子宫后倾（粉色箭头）

来源：Zidan MMA et al. Incidental extraspinal findings in the lumbar spine during magnetic resonance imaging of intervertebral discs. Heliyon. 2018;4(9):e00803. Published 2018 Sep 19. doi:10.1016/j.heliyon.2018.e00803

Most Common Müllerian Duct Anomalies

- Unicornuate Uterus (upper figure):
  > Underdevelopment of one Müllerian duct leading to a uterus with a single horn.

- Bicornuate Uterus (Unicollis and Bicollis, B):
  > Uterus with two cavities, either sharing a single cervix (unicollis) or with two separate cervixes (bicollis).
  Clinical Implication: Generally, no symptoms.
  Both types associated with Increased miscarriage risk, preterm labor and malpresentation (e.g., breech presentation). Reduced fertility reported.

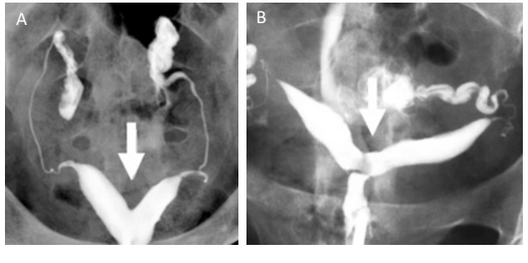
- Septate Uterus (A):
  > Most common anomaly and features a normal external shape but has an internal septum dividing it into two cavities.
  Clinical Implication: Associated with High miscarriage rate and Infertility.

- Subseptate Uterus:
  > Similar to septate uterus but with a partial septum.
  Clinical Implication: Associated with miscarriage and preterm delivery.

- Arcuate Uterus:
  > Mild form of septate uterus, with slight indentation at the top of the uterine cavity
  Clinical Implication: Generally minimal implications but slight increase in miscarriage rate.

Hysterosalpingography showing a left unicornuate uterus with an ipsilateral patent left tube.

Reproduced from: Sönmezer, M etal- (2006). Laparoscopic management of rudimentary uterine horn pregnancy: case report and literature review. JSLS: Journal of the Society of Laparoendoscopic Surgeons, 10(3), 396–399



Hysterosalpingogram showing acute angle in a septate uterus (A) and wider angle in a bicornuate uterus (B)

Reproduced from: Jayaprakasan K, Ojha K. Diagnosis of Congenital Uterine Abnormalities: Practical Considerations. Journal of Clinical Medicine. 2022; 11(5):1251. https://doi.org/10.3390/jcm11051251

Imaging of the Female Pelvis

CHAPTER OUTLINE:

女性盆腔影像学

章节大纲：

最常见苗勒管异常

- 单角子宫（上图）：
  > 一侧苗勒管发育不全，导致子宫仅形成单个宫角。

- 双角子宫（单颈和双颈，B）：
  > 子宫有两个宫腔，可共用单个宫颈（单颈）或有两个独立宫颈（双颈）。
  临床意义：一般无症状。
  这两种类型都会导致流产风险增加、早产和胎位异常（例如臀先露）。报告生育力下降。

- 纵隔子宫 (A)：
  > 最常见的异常，外部形态正常，但内部有隔膜将宫腔分为两个腔。
  临床意义：与高流产率和不孕症相关。

- 不全纵隔子宫：
  > 与纵隔子宫相似，但有部分隔膜。
  临床意义：与流产和早产相关。

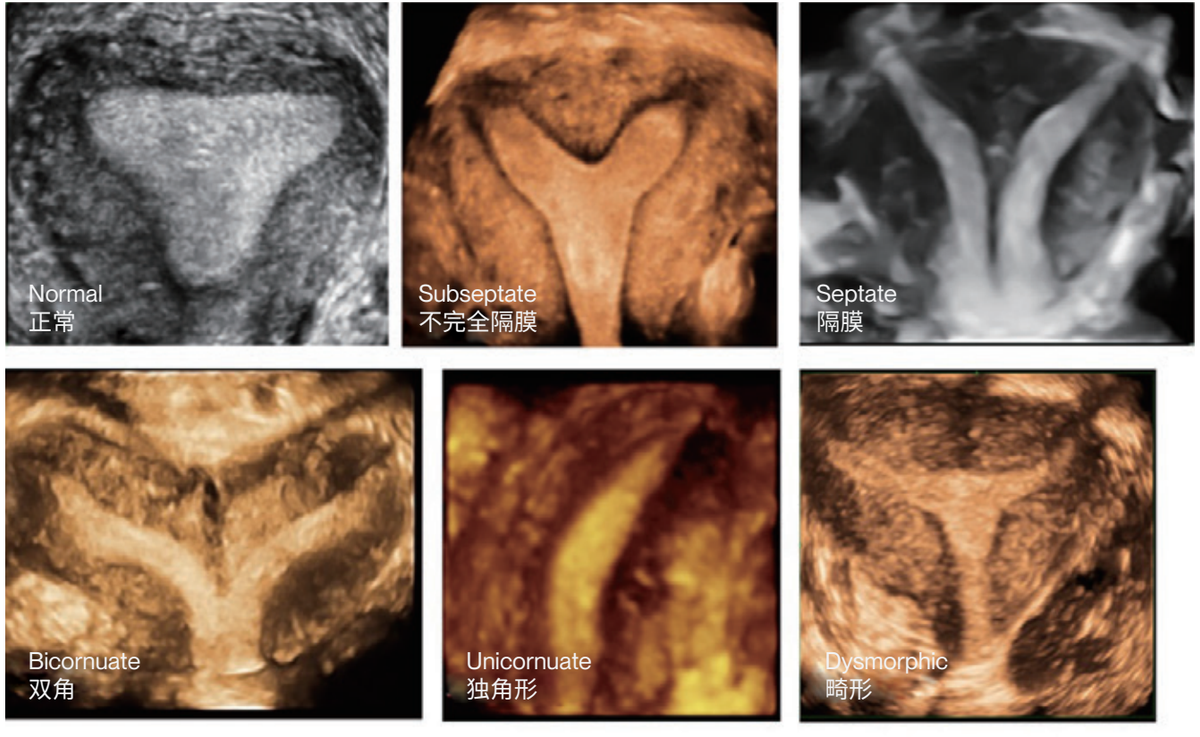
- 弓形子宫：
  > 轻度纵隔子宫，宫腔顶部有轻微凹陷
  临床意义：通常影响极小，但流产率略有增加。

子宫输卵管造影显示左侧单角子宫，同侧左侧输卵管通畅。

来源： Sönmezer, M etal- (2006). Laparoscopic management of rudimentary uterine horn pregnancy: case report and literature review. JSLS: Journal of the Society of Laparoendoscopic Surgeons, 10(3), 396–399

子宫输卵管造影显示纵隔子宫呈锐角 (A)，双角子宫呈较宽角度 (B)

来源： Jayaprakasan K, Ojha K. Diagnosis of Congenital Uterine Abnormalities: Practical Considerations. Journal of Clinical Medicine. 2022; 11(5):1251. https://doi.org/10.3390/jcm11051251



3D coronal plane of uterus: normal uterus, subseptate uterus, septate uterus, bicornuate, unicornuate uterus and dysmorphic (T-shaped) uterus.

Reproduced from: Jayaprakasan K, Ojha K. Diagnosis of Congenital Uterine Abnormalities: Practical Considerations. Journal of Clinical Medicine. 2022; 11(5):1251. https://doi.org/10.3390/jcm11051251

Imaging of the Female Pelvis

女性盆腔影像学

CHAPTER OUTLINE:

章节大纲：

子宫三维冠状位：正常子宫、不全纵隔子宫、纵隔子宫、双角子宫、单角子宫及畸形（T 形）子宫。

来源：Jayaprakasan K, Ojha K. Diagnosis of Congenital Uterine Abnormalities: Practical Considerations.Journal of Clinical Medicine. 2022; 11(5):1251. https://doi.org/10.3390/jcm11051251

Radiological Features: On ultrasound, the myometrium appears intermediate in echogenicity, with the endometrial echogenicity varying with the menstrual cycle. MRI provides detailed images of the uterus, especially useful for detecting fibroids, adenomyosis, and congenital malformations.

Transvaginal longitudinal view of a normal uterus that is anteverted. The Endometrium myometrium and serosa have a normal appearance.

Reproduced from: Narayanan M, Tafti D, Cohen HL. Pelvic Ultrasound. In: StatPearls. Treasure Island (FL): StatPearls Publishing; May 22, 2023.

Imaging of the Female Pelvis

女性盆腔影像学

影像学特征：超声检查时，子宫肌层表现为中等回声，而子宫内膜的回声会随月经周期发生变化。MRI 可提供详细的子宫图像，尤其有助于检测子宫肌瘤、子宫腺肌病和先天性畸形。

CHAPTER OUTLINE:

正常前倾子宫的经阴道纵切面视图。子宫内膜、子宫肌层和浆膜层外观正常。

来源：Narayanan M, Tafti D, Cohen HL. Pelvic Ultrasound. In: StatPearls. Treasure Island (FL): StatPearls Publishing；2023 年 5 月 22 日。

Diagnostic Imaging Techniques

Imaging of the Female Pelvis

CHAPTER OUTLINE:

女性盆腔影像学

章节大纲：

影像诊断技术

Imaging Techniques in Gynaecological and Obstetric Evaluation – Ultrasound

Types:

- **Transabdominal Ultrasound:** Generally used for early pregnancy scans and larger pelvic structures.
- **Transvaginal Ultrasound:** A specially designed probe is inserted into the vagina. Offers more detailed images, especially in early pregnancy or to assess the ovaries and uterine lining.

Indications:

- First-line for pregnancy evaluation: fetal position, number, and viability.
- Measurement of fetal structures for age and anomaly assessments.
- Uterine and ovarian pathology examination: fibroids, cysts, and endometrial growths.
- Procedure guidance, like follicular monitoring or needle biopsies.

Diagnostic Value:

- Provides dynamic, real-time imaging.
- Absence of ionising radiation makes it safe for fetuses and non-pregnant individuals.
- Economical and widely available.

Imaging of the Female **Pelvis**

女性**盆腔**影像学

CHAPTER OUTLINE:

章节大纲：

妇产科评估中的影像学技术 – 超声

类型：

- **经腹部超声：**通常用于妊娠早期扫描及较大盆腔结构的评估。
- **经阴道超声：**将专门设计的探头插入阴道进行检查。可提供更清晰的图像，尤其适用于早期妊娠或评估卵巢及子宫内膜。

适应证：

- 妊娠评估的一线检查：胎儿胎位、数量、存活情况。
- 测量胎儿结构以评估胎龄及畸形情况。
- 子宫和卵巢病理检查：子宫肌瘤、囊肿及子宫内膜增生。
- 操作引导，如卵泡监测或穿刺活检。

诊断价值：

- 提供动态实时成像。
- 无电离辐射，对胎儿及非孕妇安全。
- 经济且应用广泛。

>|< COMPARE

STRENGTHS:

+ **Non-invasive and painless:** Doesn't require any needles or injections.
+ **Safe:** No ionising radiation, making it ideal for pregnant women and fetuses.
+ **Real-time imaging:** Allows for dynamic assessment, such as fetal movements or blood flow.
+ **Portable and accessible:** Can be used in varied settings, including rural areas or at the bedside.

WEAKNESSES:

– **Operator dependent:** Image quality can vary based on the sonographer's skill.
– **Limited penetration:** Less effective for deeper structures or in patients with increased body mass.
– **Cannot visualise bones or air-filled structures effectively.**

/ Imaging of the Female Pelvis

/ 女性盆腔影像学

CHAPTER OUTLINE:

章节大纲：

>|< 比较

优势：

+ **无创、无痛：**不需要任何针头或注射。
+ **安全：**无电离辐射，非常适合孕妇和胎儿。
+ **实时成像：**可进行动态评估，例如胎动或血流。
+ **便携易用：**可用于各种环境，包括农村地区或床旁。

缺点：

– **依赖操作者：**图像质量可能因超声科医生的技术水平而异。
– **穿透力有限：**对深部结构或体重较大患者的检查效果较差。
– **无法有效显示骨骼或含气结构。**

Imaging Techniques in Gynaecological and Obstetric Evaluation – Computed Tomography (CT)

Indications:

- Not a first choice for pregnancy due to radiation but can be used if benefits outweigh risks.
- Evaluation of extensive pelvic masses and complex cysts.
- Staging of gynecological malignancies.
- Pre-operative assessments for intricate surgeries.

Diagnostic Value:

- High-resolution images suitable for viewing bone, soft tissue, and blood vessels simultaneously.
- Useful for surgical planning.
- Ionising radiation limits its use, especially in pregnant women.

Imaging of the Female Pelvis

女性盆腔影像学

CHAPTER OUTLINE:

章节大纲：

妇产科评估中的影像学技术 – 计算机断层扫描 (CT)

适应证：

- 由于存在辐射，通常不作为妊娠检查的首选，但在获益大于风险时可使用。
- 评估广泛盆腔肿块及复杂囊肿。
- 妇科恶性肿瘤的分期。
- 复杂手术的术前评估。

诊断价值：

- 高分辨率图像，适合同时观察骨骼、软组织和血管。
- 有助于手术规划。
- 电离辐射限制了其应用，尤其是在孕妇中。

>|< COMPARE

STRENGTHS:

+ **High-resolution:** Provides clear, detailed images.
+ **Speed:** Fast imaging, which can be critical in emergencies.
+ **Versatility:** Can image a wide range of body parts and conditions.
+ **3D reconstruction:** Allows for better visualisation of complex structures.

WEAKNESSES:

– **Radiation exposure:** Not ideal for pregnant women unless absolutely necessary.
– **Allergic reactions:** Some patients may react to contrast agents.
– **Less detailed for soft tissue differentiation:** Compared to MRI.

/ Imaging of the Female Pelvis

/ 女性盆腔影像学

CHAPTER OUTLINE:

章节大纲：

>|< 比较

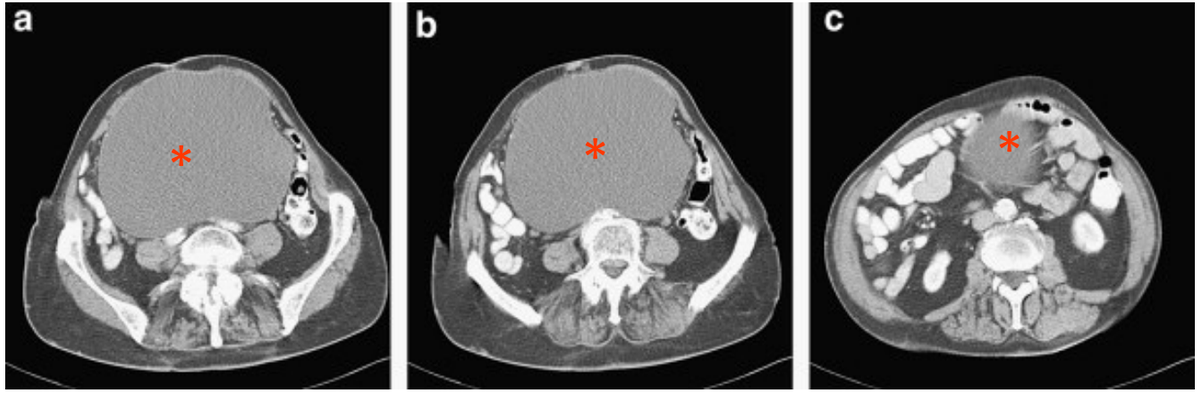
优势：

+ **高分辨率：**提供清晰、详细的图像。
+ **速度：**成像速度快，在紧急情况下至关重要。
+ **多功能性：**可对广泛的身体部位和情况进行成像。
+ **三维重建：**有助于更好地显示复杂结构。

缺点：

– **辐射暴露：**除非绝对必要，否则不适用于孕妇。
– **过敏反应：**部分患者可能对对比剂有反应。
– **对软组织的区分不够细致：**与 MRI 相比。

Simple Ovarian Cyst on Computed Tomography



Simple giant , purely cystic, unilocular ovarian cyst (asterisk), consistent with a benign cyst with aortic compression. Note the absence of internal septations or solid components which are usually associated with complex lesions

Reproduced from: J. Timmermans et al. (2009) Aortic Thrombosis Due to a Giant Ovarian Cyst. EJVES Extra, 17(4), 33-35. https://doi.org/10.1016/j.ejvsextra.2008.11.010

Imaging of the Female Pelvis

女性盆腔影像学

计算机断层扫描显示单纯性卵巢囊肿

CHAPTER OUTLINE:

单纯性巨大纯囊性单房卵巢囊肿（星号），符合良性囊肿伴主动脉受压表现。注意囊肿内无分隔或实性成分，这些结构通常与复杂性病变相关

来源：J. Timmermans et al. (2009) Aortic Thrombosis Due to a Giant Ovarian Cyst. EJVES Extra, 17(4), 33-35. https://doi.org/10.1016/j.ejvsextra.2008.11.010

Imaging Techniques in Gynaecological and Obstetric Evaluation – Magnetic Resonance Imaging (MRI)

Types:

- **Pelvic MRI:** Standard MRI for detailed examination of gynecological concerns.
- **Fetal MRI:** Provides detailed images of the fetus, especially when ultrasound results are inconclusive.

Indications:

- Deep infiltrating endometriosis.
- Placental evaluations, such as placenta accreta.
- Detailed assessment of congenital uterine anomalies.
- Fibroid mapping before myomectomy.
- Further evaluation of complex adnexal masses when ultrasound is inconclusive.

Diagnostic Value:

- Exceptional soft tissue contrast, allowing differentiation between similar tissues.
- Can visualise structures in multiple planes.
- Does not involve ionising radiation, making it safe during pregnancy.

Imaging of the Female Pelvis

女性盆腔影像学

妇产科评估中的影像学技术 - 磁共振成像 (MRI)

CHAPTER OUTLINE:

章节大纲：

类型：

- 盆腔 MRI：用于妇科问题详细检查的标准 MRI。
- 胎儿 MRI：可提供胎儿的详细图像，尤其是在超声结果不明确时。

适应证：

- 深部浸润型子宫内膜异位症。
- 胎盘评估，如胎盘粘连。
- 先天性子宫畸形的详细评估。
- 子宫肌瘤切除术前的肌瘤定位。
- 超声结果不明确时，进一步评估复杂附件包块。

诊断价值：

- 出色的软组织对比度，可用于区分相似组织。
- 可在多个平面显示结构。
- 不涉及电离辐射，因此在孕期可安全使用。

>|< COMPARE

STRENGTHS:

+ **Exceptional soft tissue contrast:** Distinguishes between tissues that appear similar on other modalities.
+ **Multi-planar imaging:** Can visualise structures in any plane without moving the patient.
+ **No ionising radiation:** Safe for most patients, including pregnant women.
+ **Functional imaging:** Can assess tissue function, not just structure.

WEAKNESSES:

– **Duration:** MRI scans can take longer than other imaging techniques.
– **Cost:** Typically more expensive than CT or US.
– **Noise:** Can be uncomfortable due to loud noises during the scan.
– **Contraindications:** Not suitable for patients with certain implants, like some pacemakers.

Imaging of the Female Pelvis

女性盆腔影像学

CHAPTER OUTLINE:

章节大纲：

>|< 比较

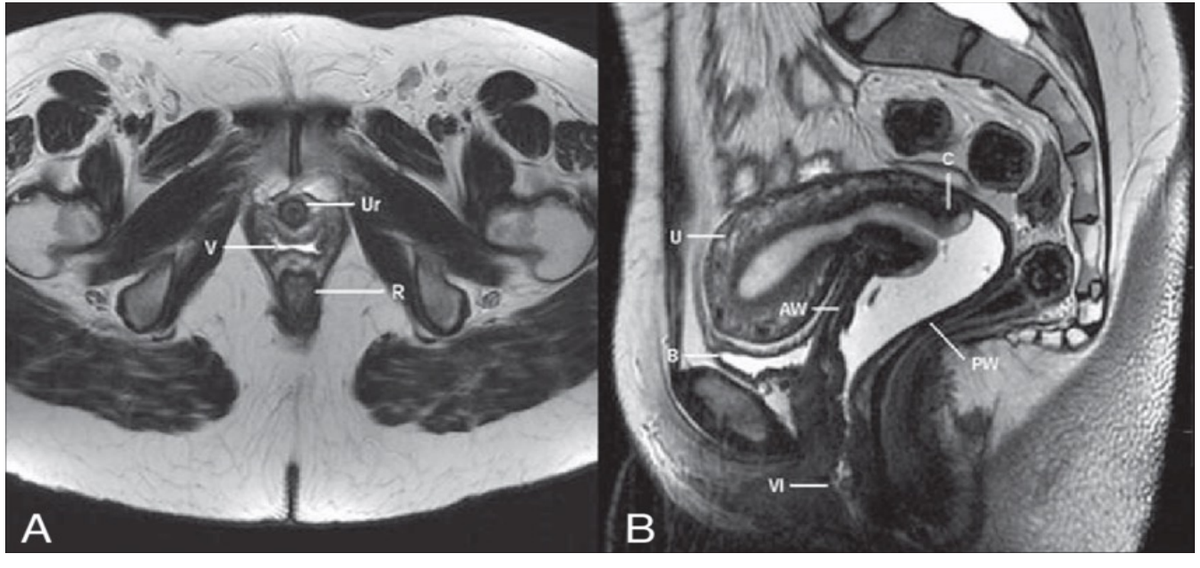
优势：

+ **出色的软组织对比度：**可区分在其他成像方式下表现相似的组织。
+ **多平面成像：**无需移动患者即可在任意平面显示结构。
+ **无电离辐射：**对大多数患者安全，包括孕妇。
+ **功能成像：**不仅能评估组织结构，还能评估组织功能。

缺点：

– **时长：**MRI 扫描所需时间可能比其他成像技术更长。
– **成本：**通常比 CT 或超声检查更贵。
– **噪音：**扫描过程中噪音较大，可能会让患者感到不适。
– **禁忌证：**不适合体内有某些植入物（如某些起搏器）的患者。

MRI of Normal Female Pelvis



Axial (A) and sagittal (B) MRI T2-weighted images showing the anterior compartment containing the urethral ostium (Ur) and the ostium of the bladder (B), the medial compartment containing the uterus (U), the uterine cervix (C), the vagina distended with gel (V), the anterior wall of the vagina (AW), the posterior wall of the vagina (PW), the vaginal vestibule (VI) and the posterior compartment with the rectum (R).

Reproduced from: Ferreira DM, Bezerra RO, Ortega CD, Blasbalg R, Viana PC, de Menezes MR, Rocha Mde S. Magnetic resonance imaging of the vagina: an overview for radiologists with emphasis on clinical decision making. Radiol Bras. 2015 Jul-Aug;48(4):249-59. doi: 10.1590/0100-3984.2013.1726. PMID: 26379324; PMCID: PMC4567364.

Imaging of the Female Pelvis

女性盆腔影像学

正常女性盆腔 MRI

CHAPTER OUTLINE:

章节大纲：

轴位 (A) 和矢状位 (B) MRI T2 加权图像显示：前盆腔：包含尿道外口 (Ur) 和膀胱口 (B)；中盆腔：包含子宫 (U)、子宫颈 (C)、充盈凝胶的阴道 (V)、阴道前壁 (AW)、阴道后壁 (PW)、阴道前庭 (VI)；后盆腔：包含直肠 (R)。

来源：Ferreira DM, Bezerra RO, Ortega CD, Blasbalg R, Viana PC, de Menezes MR, Rocha Mde S. Magnetic resonance imaging of the vagina: an overview for radiologists with emphasis on clinical decision making. Radiol Bras. 2015 Jul-Aug;48(4):249-59. doi: 10.1590/0100-3984.2013.1726. PMID: 26379324; PMCID: PMC4567364.

Diseases of Female Reproductive Organs

Imaging of the Female Pelvis

CHAPTER OUTLINE:

女性盆腔影像学

章节大纲：

女性生殖器官疾病

/ Ovarian Cysts

Ovarian cysts are fluid-filled sacs within the ovaries, encompassing several types based on their composition and origin.

Functional cysts, including follicular and corpus luteum cysts, form during the menstrual cycle and often resolve spontaneously.

Dermoid cysts, or mature teratomas, can contain various tissues such as hair, teeth, and fat.

Endometriomas are related to endometriosis and contain old blood and endometrial tissue. The characteristics of ovarian cysts vary; functional cysts are typically small and asymptomatic, while dermoid cysts and endometriomas may present more complex features and symptoms.

<!> ATTENTION

Cyst complications:

Cyst rupture:

Rupture of an ovarian cyst can lead to acute abdominal pain and, sometimes, internal bleeding. The pain is typically sudden and sharp.

Torsion:

Ovarian torsion occurs when the cyst becomes so large that it causes the ovary to twist around the ligaments that support it. This can lead to ischemia (restricted blood supply) and infarction (tissue death) of the ovary, causing severe pain and potentially affecting fertility.

Hemorrhage:

Some cysts, particularly corpus luteum cysts, can bleed internally. Hemorrhaging cysts may cause pain and can lead to significant blood loss.

/ Imaging of the Female Pelvis

/ 女性盆腔影像学

/ 卵巢囊肿

CHAPTER OUTLINE:

章节大纲：

卵巢囊肿是卵巢内充满液体的囊状结构，根据其组成和来源可分为几种类型。

功能性囊肿，包括滤泡囊肿和黄体囊肿，在月经周期中形成，通常会自行消退。

皮样囊肿或成熟畸胎瘤，可能含有多种组织，例如毛发、牙齿和脂肪。

子宫内膜异位囊肿与子宫内膜异位症有关，含有陈旧血液和子宫内膜组织。卵巢囊肿的特征各异；功能性囊肿通常较小且无症状，而皮样囊肿和子宫内膜异位囊肿可能表现出更复杂的特征和症状。

<!> 注意

囊肿并发症：

囊肿破裂：

卵巢囊肿破裂可导致急性腹痛，有时还会导致内出血。疼痛通常突然且剧烈。

蒂扭转：

当囊肿体积过大时，可导致卵巢沿其支撑韧带发生扭转，即卵巢扭转。这可能造成卵巢缺血（血供受阻）和梗死（组织坏死），引发剧烈疼痛，并可能影响生育能力。

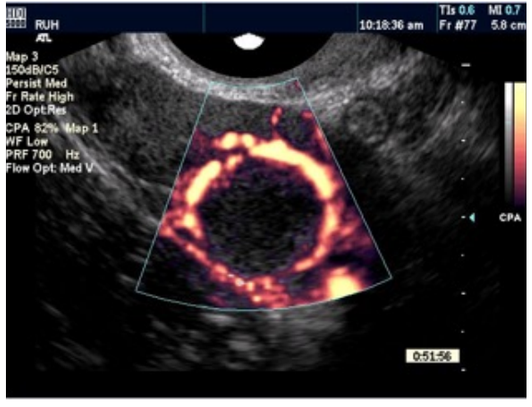
出血：

有些囊肿，尤其是黄体囊肿，可发生内部出血。出血性囊肿可能会引起疼痛，并可能导致大量失血。

/ Ovarian Cysts: Ultrasound

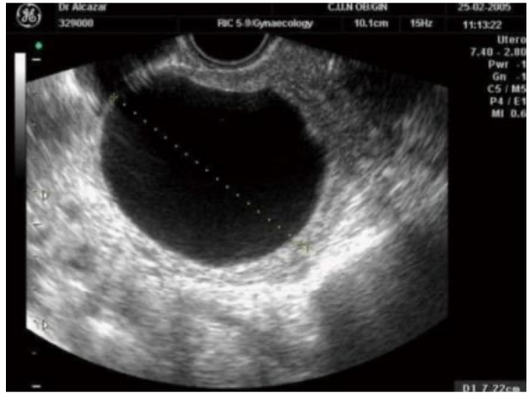
Functional Cysts:

- / Follicular cysts appear as simple, anechoic structures with a thin wall and round or oval shape, usually larger than 3 cm.
- / Corpus luteum cysts exhibit thick walls, can be hyperechoic, and may contain blood or serous fluid, giving them mixed echogenicity. Circumferential blood flow, seen during Doppler ultrasound, is a distinguishing feature, sometimes referred to as the 'ring of fire.'



Power flow Doppler image of a mature, mid-cycle luteal gland demonstrating marked periluteal vascular flow.

Reproduced from: Transvaginal ultrasonography and female infertility | GLOWM. (n.d.). Retrieved January 27, 2024, from https://www.glowm.com/section-view/heading/Transvaginal%20ultrasonography%20and%20female%20infertility/item/325#



Transvaginal ultrasound showing an ovarian simple cyst as a round anechoic thin-walled cyst with no irregularity on the internal wall measuring >7cm

Reproduced from: Alcazar JL et al. Ovarian simple cysts in asymptomatic postmenopausal women detected at transvaginal ultrasound: A review of literature. World J Obstet Gynecol 2015; 4(4): 108-112 DOI: 10.5317/wjog.v4.i4.108

Imaging of the
/ Female **Pelvis**

/ 女性**盆腔**影像学

CHAPTER OUTLINE:

章节大纲：

/ 卵巢囊肿：超声

功能性囊肿：

- / 滤泡囊肿表现为单纯无回声结构，壁薄，呈圆形或椭圆形，通常大于 3 cm。
- / 黄体囊肿的囊壁较厚，可呈高回声，可能含有血液或浆液，使其表现为混合回声。多普勒超声检查时可见周边血流，这是其特征性表现，有时被称为“火环征”。

成熟中期黄体的能量多普勒血流图像显示显著的黄体周围血管血流。

来源：Transvaginal ultrasonography and female infertility | GLOWM. (n.d.). 检索日期：2024 年 1 月 27 日，来源：https://www.glowm.com/section-view/heading/Transvaginal%20ultrasonography%20and%20female%20infertility/item/325#

经阴道超声显示卵巢单纯性囊肿，表现为圆形无回声薄壁囊肿，内壁无不规则（测量值 > 7 cm）

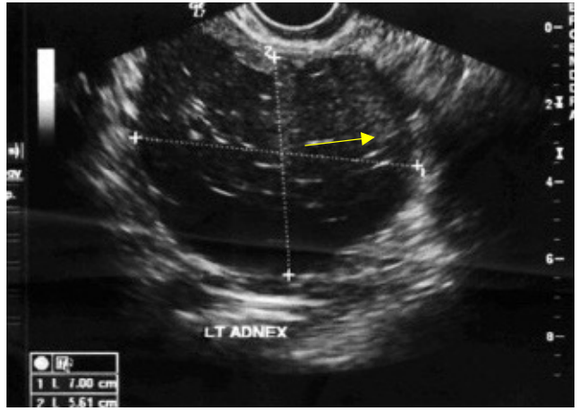
来源：Alcazar JL et al. Ovarian simple cysts in asymptomatic postmenopausal women detected at transvaginal ultrasound: A review of literature. World J Obstet Gynecol 2015; 4(4): 108-112 DOI: 10.5317/wjog.v4.i4.108

Dermoid Cysts (Mature Cystic Teratomas):

Present with complex features due to multiple tissue types, including echogenic elements for fat and hair, and possibly a Rokitansky nodule. The "dermoid mesh" is a sonographic feature of ovarian dermoid cysts, characterised by echogenic lines representing hair within the cyst.

Endometriomas:

Typically manifest as homogeneous cysts with low-level internal echoes "ground-glass", also known as "chocolate cysts."



Transvaginal ultrasound showing dermoid cyst with the characteristic dermoid mesh. (yellow arrow)

Reproduced from: Shetty NS et al. Unreported location and presentation for a parasitic ovarian dermoid cyst in an indirect inguinal hernia. Hernia. 2013;17(2):263-265. doi:10.1007/s10029-011-0876-z

Endometrioma with the ground-glass appearance

Reproduced from: Manero, M.G., Royo, P., Olartecoechea, B. et al. Endometriosis in a postmenopausal woman without previous hormonal therapy: a case report. J Med Case Reports 3, 135 (2009). https://doi.org/10.1186/1752-1947-3-135

Imaging of the Female Pelvis

女性盆腔影像学

CHAPTER OUTLINE:

章节大纲：

皮样囊肿（成熟囊性畸胎瘤）：

因包含多种组织类型而表现出复杂特征，包括脂肪和毛发的强回声成分，可能伴有 Rokitansky 结节。“皮样网”是卵巢皮样囊肿的超声特征，表现为代表囊肿内毛发的强回声线。

子宫内膜异位囊肿：

典型表现为内部低水平回声的均质囊肿（“磨玻璃样”），又称“巧克力囊肿”。

经阴道超声显示皮样囊肿伴特征性皮样网状结构（黄色箭头）。

来源：Shetty NS et al. Unreported location and presentation for a parasitic ovarian dermoid cyst in an indirect inguinal hernia. Hernia. 2013;17(2):263-265. doi:10.1007/s10029-011-0876-z

具有磨玻璃样表现的子宫内膜异位囊肿

来源：Manero, M.G., Royo, P., Olartecoechea, B. et al. Endometriosis in a postmenopausal woman without previous hormonal therapy: a case report. J Med Case Reports 3, 135 (2009). https://doi.org/10.1186/1752-1947-3-135

/ Ovarian Cysts: CT

Functional Cysts:

Can be identified as well-circumscribed, low-density lesions without significant enhancement, except in the case of corpus luteum cysts, which may show wall enhancement.

Dermoid Cysts:

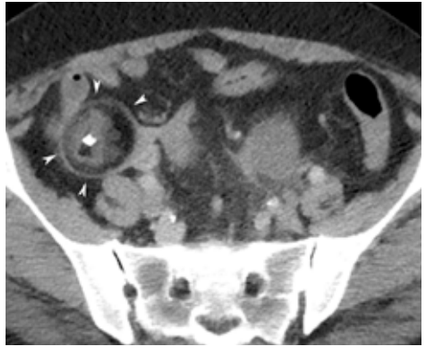
Display fat attenuation and may have calcifications, illustrating their complex composition.

Endometriomas:

While CT is not the primary modality for these lesions, they may appear as cystic masses with higher attenuation due to their haemorrhagic content.

Typical appearance of an uncomplicated corpus luteum in the second half (luteal phase) of the menstrual cycle on axial CT images: the normal-sized right ovary (arrowhead) contains a 1.5-cm cystic structure demarcated by a crenulated, strongly enhancing peripheral rim (arrow).

Reproduced from:Tonolini, M., Foti, P.V., Costanzo, V. et al. Cross-sectional imaging of acute gynaecologic disorders: CT and MRI findings with differential diagnosis—part I: corpus luteum and haemorrhagic ovarian cysts, genital causes of haemoperitoneum and adnexal torsion. Insights Imaging 10, 119 (2019). https://doi.org/10.1186/s13244-019-0808-5



Axial contrast-enhanced CT image shows a mature cystic teratoma and rounded Rokitansky nodule (arrowheads) made up of fat and a tooth-like structure in a high-density cystic mass.

Reproduced from: Sahin H, Abdullazade S, Sanci M. Mature cystic teratoma of the ovary: a cutting edge overview on imaging features. Insights Imaging. 2017 Apr;8(2):227-241. doi: 10.1007/s13244-016-0539-9. Epub 2017 Jan 19. PMID: 28105559; PMCID: PMC5359144.

CHAPTER OUTLINE:

章节大纲：

/ 卵巢囊肿：CT

功能性囊肿：

除黄体囊肿可能出现囊壁强化外，其他囊肿表现为边界清晰的低密度病变，无明显强化。

皮样囊肿：

显示脂肪衰减，可能伴有钙化，体现其复杂的成分构成。

子宫内膜异位囊肿：

虽然 CT 并非这些病变的首选检查方式，但由于其存在出血内容物，病变可能表现为衰减值较高的囊性肿块。

月经周期后半期（黄体期）单纯性黄体在轴位 CT 图像上的典型表现：正常大小的右侧卵巢（箭头端）内可见一个 1.5 cm 的囊性结构，其边界为锯齿状、强化明显的周围环（箭头）。

来源：Tonolini, M., Foti, P.V., Costanzo, V. et al. Cross-sectional imaging of acute gynaecologic disorders: CT and MRI findings with differential diagnosis—part I: corpus luteum and haemorrhagic ovarian cysts, genital causes of haemoperitoneum and adnexal torsion. Insights Imaging 10, 119 (2019). https://doi.org/10.1186/s13244-019-0808-5

轴位增强 CT 图像显示成熟囊性畸胎瘤及圆形 Rokitansky 结节（箭头），该结节由脂肪和高密度囊性肿块内的类牙齿结构组成。

来源：Sahin H, Abdullazade S, Sanci M. Mature cystic teratoma of the ovary: a cutting edge overview on imaging features. Insights Imaging. 2017 Apr;8(2):227-241. doi: 10.1007/s13244-016-0539-9. Epub 2017 Jan 19. PMID: 28105559; PMCID: PMC5359144.

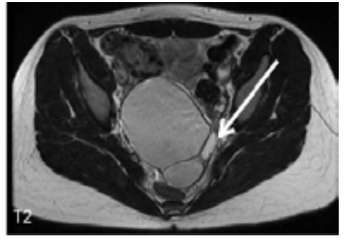
/ Ovarian Cysts: MRI

Functional Cysts:

- Appear hyperintense on T2-weighted images.
- Generally, hypointense on T1-weighted images unless they have haemorrhagic content.

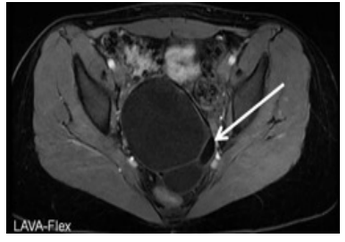
Dermoid Cysts:

- Exhibit variable signal intensities on both T1 and T2-weighted images.
- This variability is due to their heterogenous content, which can include fat, sebaceous material, hair, and calcifications.

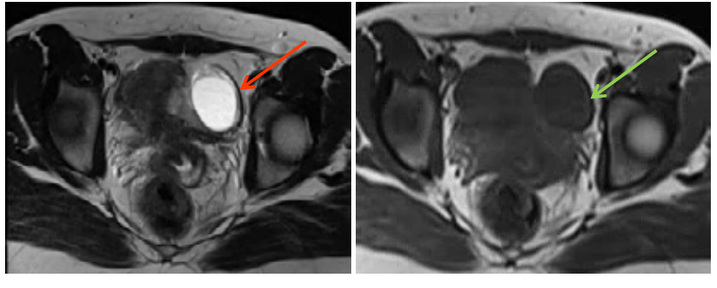


Axial T2W MRI demonstrates a pelvic cystic structure containing fat (white arrow) as indicated by the signal corresponding to that of the subcutaneous fat

Reproduced from: https://radiologypics.com/2014/03/19/ovarian-dermoid-cyst-mri/ , Last accessed on 01 Jan 2024



Axial LAVA-Flex (T1W 3D GRE (LAVA) with 2-point Dixon fat/water separation) MRI demonstrates a pelvic cystic structure containing fat (white arrow) as indicated by the signal corresponding to that of the subcutaneous fat.



Axial T2W MRI demonstrates a T2-WI hyperintense ovarian cyst (red arrow). The cyst is hypointense (green arrow) on T1W MRI.

Case courtesy of Shailaja Muniraj, Radiopaedia.org, rID: 49380

CHAPTER OUTLINE:

章节大纲：

/ 卵巢囊肿：MRI

功能性囊肿：

- 在 T2 加权成像上呈高信号。
- 通常在 T1 加权成像上呈低信号，除非囊肿内有出血内容物。

皮样囊肿：

- 在 T1 和 T2 加权成像上均表现出可变的信号强度。
- 这种信号差异源于其异质性内容物，可能包括脂肪、皮脂腺物质、毛发和钙化成分。

轴位 T2 加权 MRI 显示盆腔囊性结构内含有脂肪（白色箭头），其信号与皮下脂肪信号一致

来源：https://radiologypics.com/2014/03/19/ovarian-dermoid-cyst-mri/，最后访问日期：2024 年 1 月 1 日

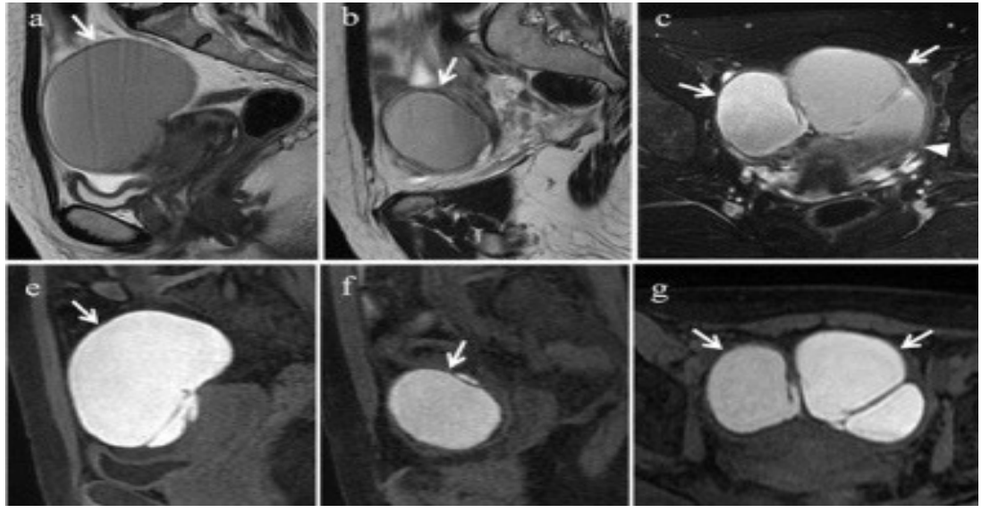
轴位 LAVA-Flex 序列（T1 加权三维扰相梯度回波 [3D GRE LAVA]，两点 Dixon 脂肪/水分离技术）MRI 显示盆腔囊性结构内含有脂肪（白色箭头），其信号与皮下脂肪信号一致。

轴位 T2 加权 MRI 显示 T2 加权成像高信号的卵巢囊肿（红色箭头）。该囊肿在 T1 加权 MRI 上呈低信号（绿色箭头）。

病例来源：Shailaja Muniraj，Radiopaedia.org，rID：49380

Endometriomas:

The criteria to identify endometriomas on MRI include the presence of numerous cysts that are bright on T1 sequences OR at least one cyst that not only shows high T1 signal intensity but also displays a gradient of intensity on T2 sequences, often described as "shading."



(a, b) Sagittal, (c) oblique axial T2-weighted images show bilateral endometriomas with intermediate to low signal intensity (white arrows). The ovaries are joined together behind the uterus (kissing ovaries). Note the low signal intensity in the declivous portion of the left cyst ("shading" sign, white arrowhead in c). On (e, f) sagittal and (g) oblique axial fat-suppressed T1-weighted images the cysts demonstrate high signal intensity (white arrows)

Reproduced from: Foti PV, Farina R, Palmucci S, Vizzini IAA, Libertini N, Coronella M, Spadola S, Caltabiano R, Iraci M, Basile A, Milone P, Cianci A, Ettorre GC. Endometriosis: clinical features, MR imaging findings and pathologic correlation. Insights Imaging. 2018 Apr;9(2):149-172. doi: 10.1007/s13244-017-0591-0. Epub 2018 Feb 15. PMID: 29450853; PMCID: PMC5893487.

Imaging of the Female Pelvis

女性盆腔影像学

CHAPTER OUTLINE:

章节大纲：

子宫内膜异位囊肿：

MRI 上识别子宫内膜异位囊肿的标准包括：存在多个 T1 序列明亮信号囊肿，或至少有一个囊肿不仅表现为 T1 高信号，且在 T2 序列上呈现信号梯度（常称为“阴影征”）。

（a、b）矢状位、(c) 斜轴位 T2 加权成像显示双侧子宫内膜异位囊肿呈中低信号（白色箭头）。卵巢在子宫后方相连（“接吻卵巢”）。注意左侧囊肿下垂部分的低信号（“阴影征”，c 图中白色箭头）。在（e、f）矢状位及 (g) 斜轴位脂肪抑制 T1 加权成像上，囊肿呈高信号（白色箭头）。

来源：Foti PV, Farina R, Palmucci S, Vizzini IAA, Libertini N, Coronella M, Spadola S, Caltabiano R, Iraci M, Basile A, Milone P, Cianci A, Ettorre GC. Endometriosis: clinical features, MR imaging findings and pathologic correlation. Insights Imaging. 2018 Apr;9(2):149-172. doi: 10.1007/s13244-017-0591-0. Epub 2018 Feb 15. PMID: 29450853; PMCID: PMC5893487.

/ Uterine Fibroids (Leiomyomas)

Uterine fibroids, or leiomyomas, are benign growths originating from the smooth muscle tissue of the uterus. They are categorised into several types based on their location within the uterus.

Sub-serosal fibroids: These fibroids develop on the outer surface of the uterus and may grow outward, potentially causing pressure on adjacent organs, such as the bladder or rectum.

Intramural fibroids: Intramural fibroids are located within the muscular wall of the uterus. They can lead to uterine enlargement and distortion, often causing heavy menstrual bleeding and pelvic pain.

Submucosal fibroids: Submucosal fibroids protrude into the uterine cavity and can significantly affect fertility by interfering with implantation or causing recurrent miscarriages.

<!> ATTENTION

Uterine fibroids are hormonally responsive and often grow during reproductive years. Their size can vary from small nodules to large masses, with symptoms ranging from heavy menstrual bleeding to pelvic pressure and pain.

/ 子宫肌瘤（平滑肌瘤）

CHAPTER OUTLINE:

章节大纲：

子宫肌瘤，又称子宫平滑肌瘤，是起源于子宫平滑肌组织的良性增生。根据其在子宫内的位置，可分为多种类型。

浆膜下肌瘤：这类肌瘤生长于子宫外表面，可能向外突出，有可能对邻近器官（如膀胱或直肠）产生压迫。

肌壁间肌瘤：肌壁间肌瘤位于子宫肌壁内。它们可导致子宫增大和形态改变，常引起月经量过多及盆腔疼痛。

黏膜下肌瘤：黏膜下肌瘤向宫腔内突出，可通过干扰胚胎着床或导致反复流产，显著影响生育能力。

<!> 注意

子宫肌瘤对激素敏感，通常在育龄期生长。其大小可从小结节至巨大肿块不等，症状包括月经量过多、盆腔压迫感及疼痛。

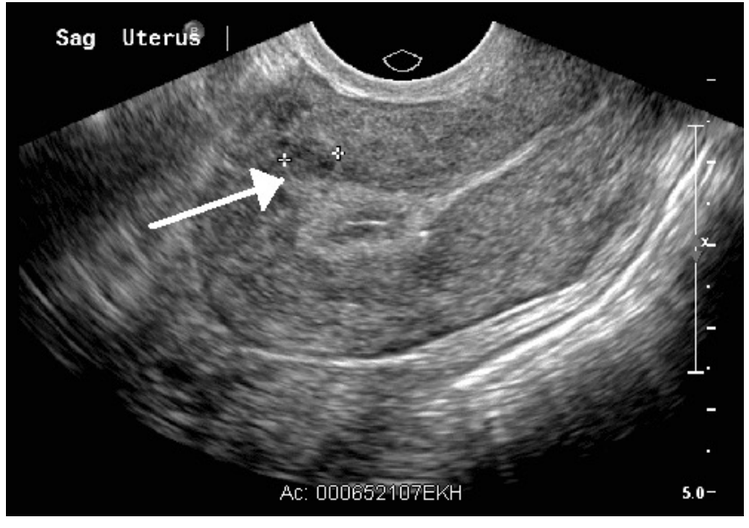
/ Uterine Fibroid: Ultrasound

Uterine fibroids appear as well-defined, hypoechoic (darker) masses.

Subserosal fibroids may be observed on the uterine surface, intramural fibroids within the uterine wall, and submucosal fibroids projecting into the uterine cavity. Their echogenicity can vary depending on their composition.

Larger fibroids may have a heterogeneous texture due to degenerative changes.

Calcified fibroids present with acoustic shadowing.



A hypoechoic intramural fibroid on pelvic ultrasound.

Reproduced from: James Heilman, MD, https://en.wikipedia.org/wiki/File:UterineFirboid.png

Imaging of the
/ Female
Pelvis

/ 女性**盆腔**影像学

/ 子宫肌瘤：超声

CHAPTER OUTLINE:

章节大纲：

子宫肌瘤表现为边界清晰的低回声（暗色）肿块。

浆膜下肌瘤可在子宫表面观察到，肌壁间肌瘤位于子宫肌壁内，黏膜下肌瘤则向宫腔内突出。其回声强度因成分不同而异。

较大的肌瘤因退行性变可能回声不均匀。

钙化的肌瘤可出现声影。

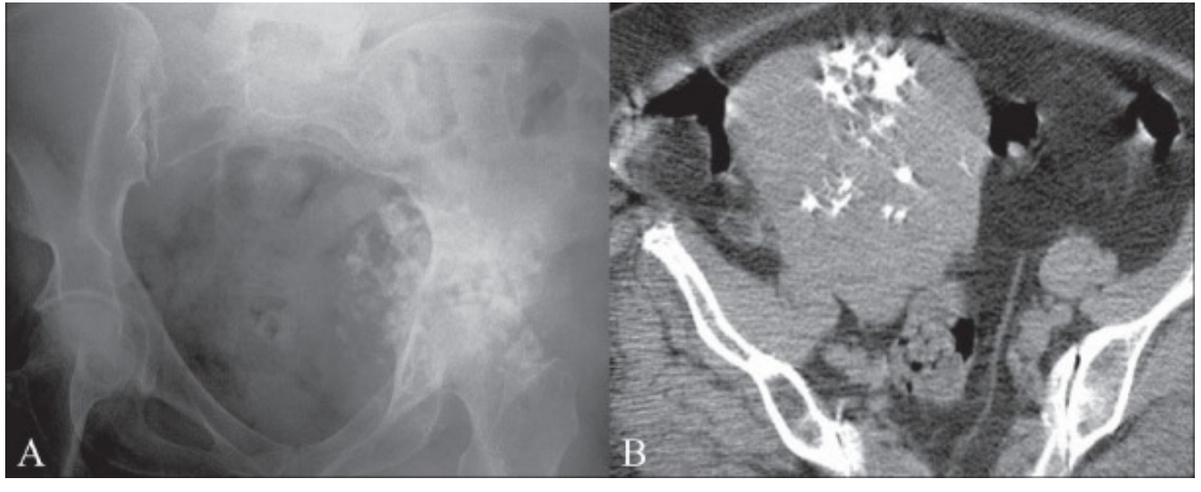
盆腔超声显示低回声的肌壁间肌瘤。

来源：James Heilman 医学博士，https://en.wikipedia.org/wiki/File:UterineFirboid.png

/ Uterine Fibroid: CT

<!> ATTENTION

Uterine fibroids may be incidentally detected on CT as well-circumscribed, low-density lesions within the uterine wall. CT is not the primary modality for fibroid evaluation but may show their presence. Fibroids may not be distinguishable from the normal myometrium on non-contrast scans.



A 58-year-old woman with sacral pain. A frontal pelvic radiograph (A) shows calcification overlying the left hip, initially thought to be suggestive of a chondrosarcoma. A subsequent CT scan (B) reveals an incidental calcified fibroid

Reproduced from: Wilde, S., & Scott-Barrett, S. (2009). Radiological appearances of uterine fibroids. The Indian journal of radiology & imaging, 19(3), 222–231. https://doi.org/10.4103/0971-3026.54887

/ 子宫肌瘤：CT

CHAPTER OUTLINE:

章节大纲：

<!> 注意

CT 可能偶然发现子宫肌瘤，其表现为子宫壁内边界清晰的低密度病变。CT 并非评估子宫肌瘤的主要检查方式，但其可显示肌瘤的存在。非增强扫描可能无法区分肌瘤与正常子宫肌层。

58 岁女性，骶部疼痛。盆腔正位 X 线片 (A) 显示左髋关节上方钙化，最初考虑可能为软骨肉瘤。后续 CT 扫描 (B) 意外发现钙化肌瘤

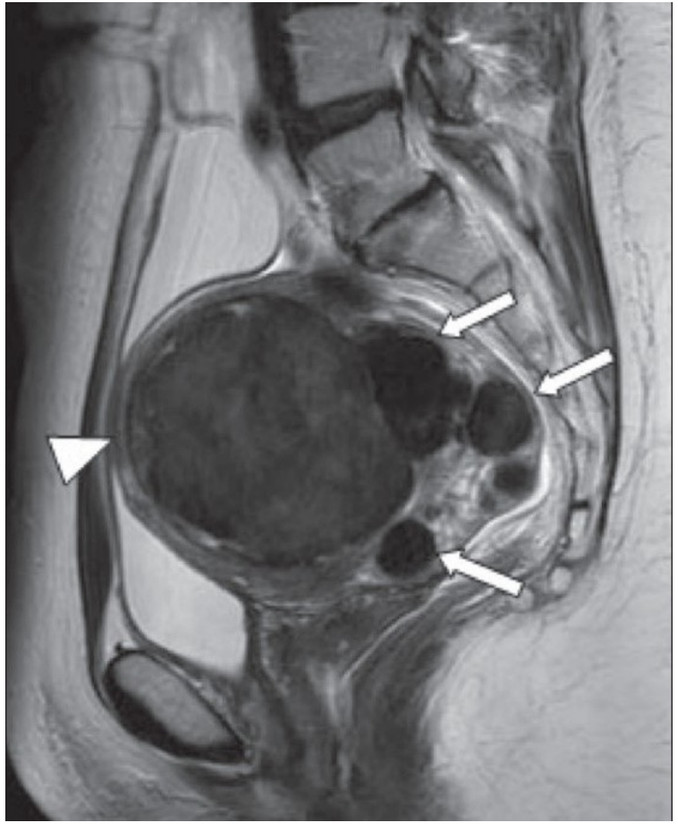
来源：Wilde, S., & Scott-Barrett, S. (2009). Radiological appearances of uterine fibroids. The Indian journal of radiology & imaging, 19(3), 222–231. https://doi.org/10.4103/0971-3026.54887

/ Uterine Fibroid: MRI

Uterine fibroids appear as well-defined masses with low signal intensity on T2-weighted images.

Degenerating fibroids may have varied signal intensity and may show enhancement after contrast administration.

MRI is superior for assessing the number, size, and location of fibroids, critical for surgical planning.



Sagittal T2W MRI image shows multiple intramural fibroids (arrows); the largest (arrowhead) lying anteriorly measures 8.5 cm. These show typical low-signal intensity.

Reproduced from: Wilde, S. et al. (2009). Radiological appearances of uterine fibroids. The Indian journal of radiology & imaging, 19(3), 222–231. https://doi.org/10.4103/0971-3026.54887

Imaging of the
/ Female
Pelvis

/ 女性**盆腔**影像学

/ 子宫肌瘤：MRI

CHAPTER OUTLINE:

章节大纲：

子宫肌瘤在 T2 加权像上表现为边界清晰的低信号肿块。

退变的肌瘤可能信号不均，增强扫描后可出现强化。

MRI 在评估肌瘤的数量、大小和位置方面更优，这对制定手术计划至关重要。

矢状位 T2 加权 MRI 图像显示多个肌壁间肌瘤（箭头）；最大的肌瘤（箭头端）位于前方，大小 8.5 cm。这些肌瘤呈典型低信号。

来源： Wilde, S. et al. (2009). Radiological appearances of uterine fibroids. The Indian journal of radiology & imaging, 19(3), 222-231. https://doi.org/10.4103/0971-3026.54887

/ Endometriosis

Endometriosis is a chronic condition characterised by the presence of tissue similar to the uterine lining outside the uterus, often involving various pelvic structures.

There are different types of endometriosis:

- **Superficial endometriosis:** it involves the peritoneal surface, where endometrial-like tissue forms small lesions or adhesions
- **Ovarian endometriosis (endometriomas):** also known as chocolate cysts or endometriotic cysts (see age 34)
- **Deep infiltrating endometriosis (DIE):** DIE extends into pelvic organs, such as the rectovaginal septum, bladder, or bowel, creating nodular lesions or thickening of tissues. DIE is defined as endometriosis lesions with a depth of more than 5 mm

Endometriosis lesions can vary in size and severity, causing symptoms such as pelvic pain, dysmenorrhea, dyspareunia, and infertility. The condition may be hormonally responsive.

/ 子宫内膜异位症

CHAPTER OUTLINE:

章节大纲：

子宫内膜异位症是一种慢性疾病，其特征为子宫外存在类似于子宫内膜的组织，常累及多种盆腔结构。

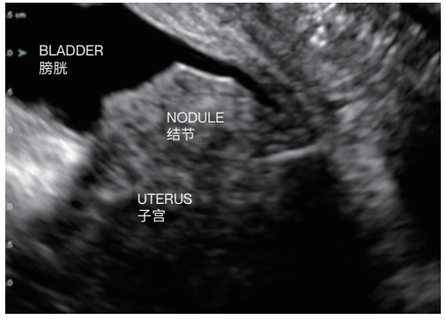
子宫内膜异位症有不同类型：

- **浅表型子宫内膜异位症：**累及腹膜表面，子宫内膜样组织在腹膜表面形成小病灶或粘连
- **卵巢型子宫内膜异位症（子宫内膜异位囊肿）：**也称为巧克力囊肿或子宫内膜异位性囊肿（见第 34 页）
- **深部浸润型子宫内膜异位症（Deep infiltrating endometriosis，DIE）：**DIE 病灶侵入盆腔器官，如直肠阴道隔、膀胱或肠道，形成结节性病变或组织增厚。DIE 定义为浸润深度超过 5 mm 的子宫内膜异位症病灶

子宫内膜异位症病灶的大小和严重程度各异，可引起盆腔疼痛、痛经、性交痛和不孕等症状。该疾病可能对激素敏感。

/ Endometriosis: Ultrasound

Superficial endometriosis may not be easily visualised on ultrasound. Endometriosis nodules typically present on ultrasound as solid, irregularly shaped masses with low echogenicity, possibly featuring echogenic spots or tiny cysts, they usually exhibit minimal to no vascular signal on colour Doppler imaging.

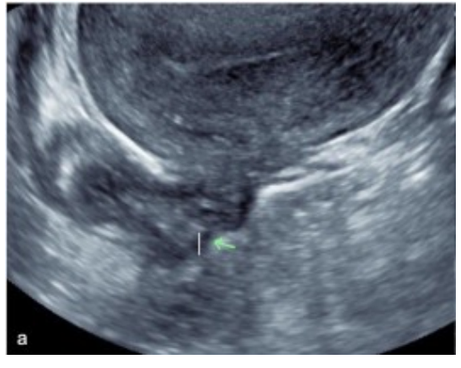


Deep infiltrating endometriosis (DIE) nodule of the bladder appearing as a protrusive nodule arising from the bladder base towards the lumen of the bladder

Reproduced from: Daniilidis, A. et al. (2022). Transvaginal Ultrasound in the Diagnosis and Assessment of Endometriosis-An Overview: How, Why, and When. Diagnostics (Basel, Switzerland), 12(12), 2912. https://doi.org/10.3390/diagnostics12122912

<!> ATTENTION

Studies have demonstrated that when a transvaginal ultrasound is expanded to evaluate not just the uterus and ovaries but also the anterior and posterior regions, its accuracy in identifying deep endometriosis exceeds 90%.



Transvaginal ultrasound image of 35-year-old female with pelvic pain and history of endometriosis, showing typical hypoechoic endometriotic nodule (arrow) invading two segments of the rectosigmoid with hyperechoic rim (arrowhead).

Reproduced from: Khatri, G. D et al. (2023). Rectal endometriosis imaging: A case based pictorial essay. WFUMB Ultrasound Open, 1(1), 100002. https://doi.org/10.1016/J.WFUMBO.2023.100002

Imaging of the
/ Female **Pelvis**

/ 女性**盆腔**影像学

CHAPTER OUTLINE:

章节大纲：

/ 子宫内膜异位症：超声

浅表型子宫内膜异位症在超声检查中可能不易发现。子宫内膜异位症结节在超声上通常表现为实性、形态不规则的低回声肿块，可能伴有强回声斑点或微小囊肿，彩色多普勒成像显示其血流信号通常极少或无血流信号。

<!> 注意

研究表明，当经阴道超声检查范围不仅包括子宫和卵巢，还扩展至前、后区域时，其识别深部子宫内膜异位症的准确率超过 90%。

膀胱深部浸润型子宫内膜异位症 (DIE) 结节，表现为从膀胱底部向膀胱腔内突出的结节

来源：Daniilidis, A. et al. (2022). Transvaginal Ultrasound in the Diagnosis and Assessment of Endometriosis-An Overview: How, Why, and When. Diagnostics (Basel, Switzerland), 12(12), 2912. https://doi.org/10.3390/diagnostics12122912

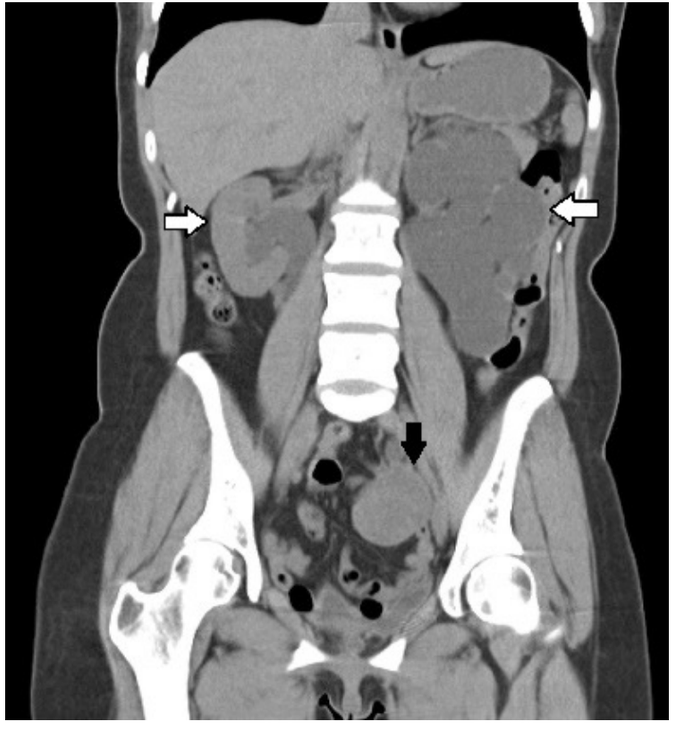
35 岁女性，有盆腔疼痛和子宫内膜异位症病史，经阴道超声图像显示典型的低回声子宫内膜异位结节（箭头）侵犯直肠乙状结肠的两个节段，伴高回声边缘（箭头端）。

来源：Khatri, G. D et al. (2023). Rectal endometriosis imaging: A case based pictorial essay. WFUMB Ultrasound Open, 1(1), 100002. https://doi.org/10.1016/J.WFUMBO.2023.100002

/ Endometriosis: CT

As CT of the pelvis does not visualise pelvic organs well, it is not useful in the diagnosis of endometriosis.

An important role for the CT scan with contrast is to detect ureteral involvement and possible renal insufficiency.



Pelvic CT (computed tomography) showed 4.5 cm sized left adnexal mass (black arrow in (a)) abutting with and obstructing the left distal ureter, resulting in severe left hydroureteronephrosis with complete loss of the left renal parenchyma; it also showed right mild hydroureteronephrosis without definite obstructive lesion (white arrows in (a) and (b)

Reproduced from: Charatsi, D. et al. (2018). Gastrointestinal and Urinary Tract Endometriosis: A Review on the Commonest Locations of Extrapelvic Endometriosis. Advances in medicine, 2018, 3461209. https://doi.org/10.1155/2018/3461209

CHAPTER OUTLINE:

章节大纲：

/ 子宫内膜异位症：CT

由于盆腔 CT 无法清晰显示盆腔器官，因此在子宫内膜异位症的诊断中没有帮助。

增强 CT 扫描的一个重要作用是检测输尿管受累情况及可能存在的肾功能不全。

盆腔 CT（计算机断层扫描）显示：左侧附件区有一个 4.5 cm 大小的肿块（(a) 中的黑色箭头），紧贴左侧输尿管远端并造成梗阻，导致严重左侧输尿管肾盂积水，左肾实质完全丧失；同时显示右侧轻度输尿管肾盂积水，无明确梗阻性病变（(a) 和 (b) 中的白色箭头）。

来源： Charatsi, D. et al. (2018). Gastrointestinal and Urinary Tract Endometriosis: A Review on the Commonest Locations of Extrapelvic Endometriosis. Advances in medicine, 2018, 3461209. https://doi.org/10.1155/2018/3461209

/ Endometriosis: MRI

Characteristic hemorrhagic lesions: These lesions, often referred to as "powder burn" due to their appearance, display a pronounced brightness on T1 fat-saturated MRI sequences.

Solid deep lesions: On MRI, they typically show increased signal intensity on T1 sequences and decreased intensity on T2 sequences.

Tissue adhesions and scarring: On MRI, these present with a signal intensity that matches the pelvic muscles on both T1 and T2 sequences. They can lead to:

- Fine, low-intensity strands that blur the delineation between organs
- Anatomical alterations, backward shift of the uterus, ovaries in close proximity in advanced stages (commonly referred to as the "kissing ovaries" sign), misalignment of bowel segments, and upward shift of the posterior part of the vaginal cavity
- Pockets of trapped fluid and the presence of fluid-filled fallopian tubes, known as hydrosalpinx

Deep infiltrating endometriosis Sagittal fat-suppressed T1-weighted image shows an endometriotic nodule (white arrows) infiltrating the muscular layer of the anterior rectal wall. The lesion displays homogeneous intermediate signal intensity due to fibrous tissue and smooth muscle

Reproduced from: Foti, P. V. et al. (2018). Endometriosis: clinical features, MR imaging findings and pathologic correlation. Insights into imaging, 9(2), 149–172. https://doi.org/10.1007/s13244-017-0591-0

CHAPTER OUTLINE:

章节大纲：

/ 子宫内膜异位症：MRI

特征性出血性病变：这些病变因其外观常被称为“粉烧伤”，在 T1 脂肪抑制 MRI 序列上表现出明显高信号。

实性深部病变：在 MRI 上，其通常表现为 T1 序列信号增高，T2 序列信号降低。

组织粘连和瘢痕形成：在 MRI 上，这些病变在 T1 和 T2 序列上的信号强度均与盆腔肌肉信号一致。其可导致：

- 纤细的低信号条索影，使器官间分界模糊
- 解剖结构改变，子宫后移，晚期卵巢位置靠近（通常称为“接吻卵巢”征），肠管节段错位，阴道后穹隆上移
- 积液囊及充满液体的输卵管（称为输卵管积水）

深部浸润型子宫内膜异位症矢状位脂肪抑制 T1 加权图像显示，子宫内膜异位结节（白色箭头）浸润直肠前壁肌层。病变因纤维组织和平滑肌成分呈均匀中等信号强度

来源：Foti, P. V. et al. (2018). Endometriosis: clinical features, MR imaging findings and pathologic correlation. Insights into imaging, 9(2), 149–172. https://doi.org/10.1007/s13244-017-0591-0

/ Ovarian Torsion

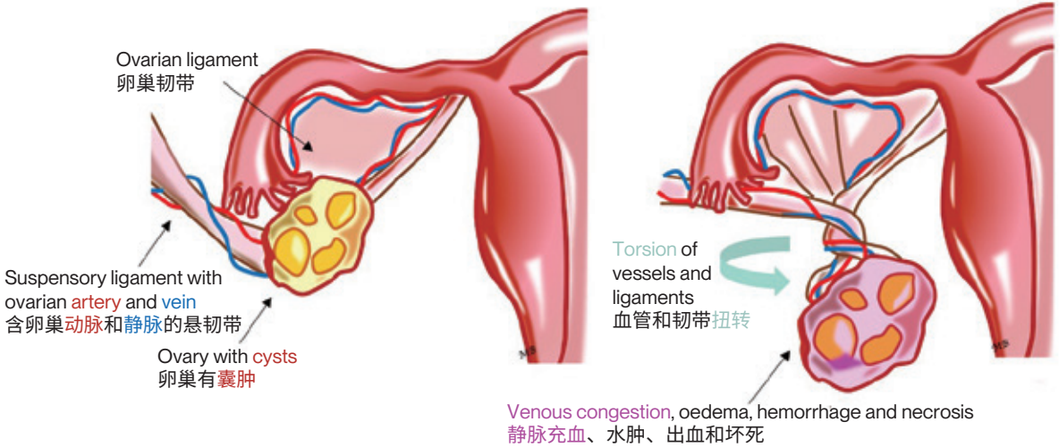
Ovarian torsion is a critical condition that often presents as an acute gynecological emergency.

It is caused by partial or complete rotation of the ovary on its ligamentous supports, potentially leading to occlusion of the ovarian artery and vein. This can result in ischemia and infarction of the ovary and, if not promptly addressed, may lead to loss of ovarian function.

Ovarian torsion is frequently associated with the presence of ovarian cysts or masses, which can act as a fulcrum for the rotation.

Clinical Presentation:

Patients with ovarian torsion often present with sudden, severe pelvic pain, sometimes accompanied by nausea and vomiting. The pain may be intermittent or constant and is typically unilateral.



CHAPTER OUTLINE:

章节大纲：

/ 卵巢扭转

卵巢扭转是一种危急情况，常表现为急性妇科急症。

它由卵巢在其韧带支撑结构上发生部分或完全扭转所致，可能导致卵巢动静脉闭塞。这可导致卵巢缺血和梗死，如不及时处理，可能导致卵巢功能丧失。

卵巢扭转常伴有卵巢囊肿或肿块，这些病变可作为扭转的支点。

临床表现：

卵巢扭转患者常表现为突发的剧烈盆腔疼痛，有时伴有恶心和呕吐。疼痛可为间歇性或持续性，通常为单侧。

/ Ovarian Torsion: Ultrasound

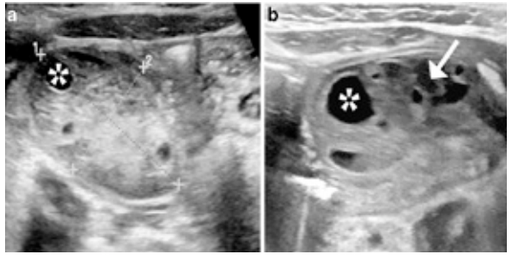
Ultrasound, often the initial diagnostic tool in assessing acute pelvic pain, presents variable sensitivity and specificity in detecting torsion. Transvaginal ultrasonography (TVUS) provides superior visualisation of the ovaries, allowing for a more detailed evaluation of ovarian vascularity, the presence of a twisted vascular pedicle, and a clearer characterisation of any adnexal masses.

Ovarian Morphology and Positioning:

The ovary typically presents with marked enlargement due to edematous changes, with follicles characteristically arrayed along the periphery along with hyperechoic margin (follicular ring sign). This displacement is a response to the central stromal swelling that pushes the follicles outward.

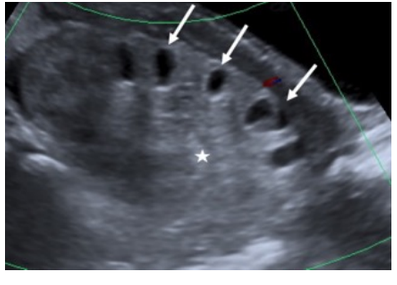
Vascular and Tissue Characteristics:

The ovarian stroma appears abnormally echogenic as a result of edema, and Doppler US imaging may reveal a complete or partial absence of both arterial and venous flow, suggesting a compromised blood supply.



The initial US of the lower abdomen in a pre-pubertal girl shows an enlarged ovary (calipers) with peripheral follicles (asterisk), consistent with an ovarian torsion. b Follow-up some days later in the same girl as in (a) shows cystic ovarian compartments (asterix) with sedimented echoes (arrow) indicating progressive hemorrhagic infarction.

Reproduced from: Riccabona, M. et al . (2017). European Society of Paediatric Radiology abdominal imaging task force recommendations in paediatric uroradiology, part IX: Imaging in anorectal and cloacal malformation, imaging in childhood ovarian torsion, and efforts in standardising paediatric uroradiology terminology. Pediatric Radiology, 47(10), 1369–1380. https://doi.org/10.1007/S00247-017-3837-6/FIGURES/12



Ultrasound image of the right ovary demonstrates enlargement, overall reduced Doppler signal, peripherally displaced follicles (white arrows) and echogenic central stroma (white star), consistent with ovarian torsion.

F. C. Daley, J. Smith, A. Shakur, P. L. Moyle, H. C. Addley, S. Freeman. Twists and turns of the female pelvis' – a pictorial review of adnexal torsion https://dx.doi.org/10.1594/ecr2018/C-1373

Imaging of the
/ Female Pelvis

/ 女性盆腔影像学

CHAPTER OUTLINE:

章节大纲：

/ 卵巢扭转：超声

超声通常是评估急性盆腔痛的初始诊断工具，但其在检测扭转时的敏感性和特异性存在差异。经阴道超声检查（transvaginal ultrasonography，TVUS）能更好地显示卵巢结构，从而更详细地评估卵巢血管分布、是否存在扭转的血管蒂，还能更清晰地显示附件肿块的特征。

卵巢形态与位置：

由于水肿改变，卵巢通常表现为明显增大，卵泡特征性地沿周边排列，并伴有高回声边缘（卵泡环征）。这种移位是中央基质肿胀将卵泡向外推挤的结果。

血管和组织特征：

由于水肿，卵巢基质表现为异常高回声，多普勒超声成像可能显示动脉和静脉血流完全或部分缺失，提示血供受损。

一名青春期前女孩的下腹部初始超声检查显示卵巢增大（卡尺），周边见卵泡（星号），符合卵巢扭转表现 (b)。同一女孩数日后的随访检查 (a) 显示卵巢内囊性区（星号）伴沉积性回声（箭头），提示进行性出血性梗死。

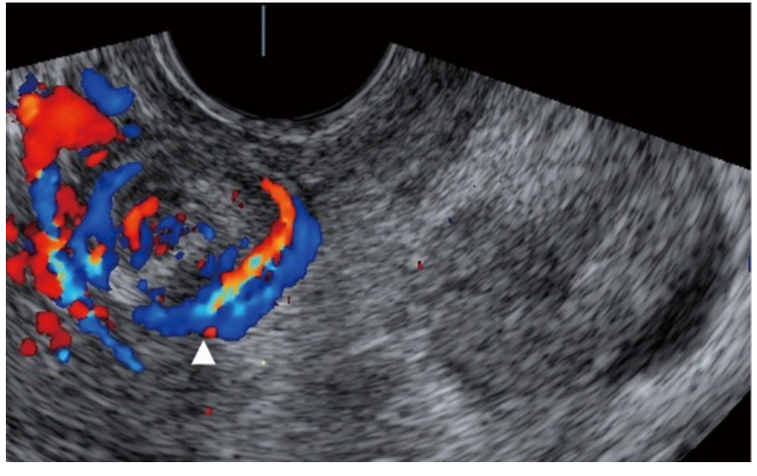
来源： Riccabona, M. et al . (2017). European Society of Paediatric Radiology abdominal imaging task force recommendations in paediatric uroradiology, part IX: Imaging in anorectal and cloacal malformation, imaging in childhood ovarian torsion, and efforts in standardising paediatric uroradiology terminology. Pediatric Radiology, 47(10), 1369–1380. https://doi.org/10.1007/S00247-017-3837-6/FIGURES/12

右侧卵巢超声图像显示体积增大、多普勒信号整体减弱、卵泡向周边移位（白色箭头）及中央基质呈高回声（白色星号），符合卵巢扭转表现。

F. C. Daley, J. Smith, A. Shakur, P. L. Moyle, H. C. Addley, S. Freeman. Twists and turns of the female pelvis' – a pictorial review of adnexal torsion https://dx.doi.org/10.1594/ecr2018/C-1373

Whirlpool sign: On Doppler ultrasound, the twisted vascular pedicle often manifests as the 'whirlpool' sign—a hallmark feature indicating torsion. Additionally, the presence of an extraneous knot-like structure may represent the actual site of the twisted pedicle.

Secondary signs and symptomatic response: The presence of ascites and elicited probe tenderness during a transvaginal scan further supports the diagnosis. The tenderness is indicative of the acute inflammatory process set off by the torsion and the resultant pressure effects on adjacent pelvic structures.



Transvaginal sonogram with 3D render mode indicates a whirlpool sign. The whirlpool sign (▲) presents as coiled, twisted, or circular vessels on Doppler US.

Reproduced from: Feng, J. L., Zheng, J., Lei, T., Xu, Y. J., Pang, H., & Xie, H. N. (2020). Comparison of ovarian torsion between pregnant and non-pregnant women at reproductive ages: sonographic and pathological findings. Quantitative imaging in medicine and surgery, 10(1), 137–147. https://doi.org/10.21037/qims.2019.11.06

Imaging of the Female Pelvis

女性盆腔影像学

CHAPTER OUTLINE:

章节大纲：

漩涡征：在多普勒超声上，扭转的血管蒂通常表现为“漩涡”征，这是提示扭转的标志性特征。此外，出现外来结节样结构可能代表血管蒂扭转的实际部位。

次要征象及症状反应：存在腹水以及经阴道扫描时探头触痛进一步支持诊断。触痛提示扭转引发的急性炎症反应及对邻近盆腔结构产生的压迫效应。

三维渲染模式的经阴道声像图显示漩涡征。漩涡征 (▲) 在多普勒超声上表现为盘绕、扭曲或环状血管。

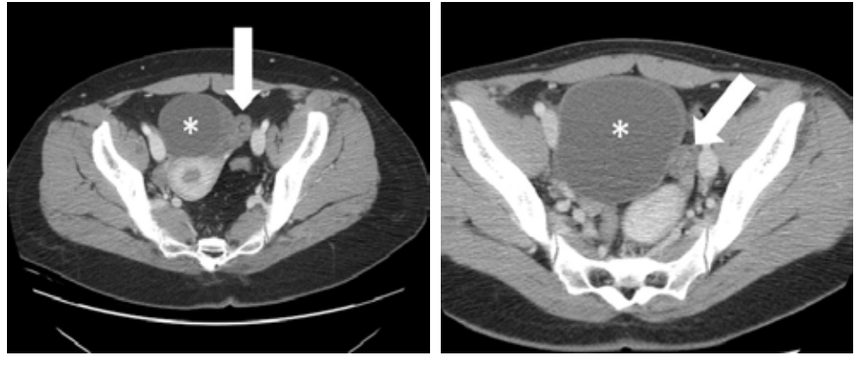
来源：Feng, J. L., Zheng, J., Lei, T., Xu, Y. J., Pang, H., & Xie, H. N. (2020). Comparison of ovarian torsion between pregnant and non-pregnant women at reproductive ages: sonographic and pathological findings. Quantitative imaging in medicine and surgery, 10(1), 137–147. https://doi.org/10.21037/qims.2019.11.06

/ Ovarian Torsion: CT

Ovarian Enlargement: The ovary typically appears homogeneously enlarged and may be deviated to the midline, a common sign of torsion.

Fat Stranding: The presence of fat stranding and free fluid in the adjacent pelvic area often indicates inflammation or haemorrhage secondary to torsion.

Twisted Vascular Pedicle: The CT hallmark of torsion is the visualisation of a twisted ovarian pedicle. The appearance of this twisted pedicle on CT is considered pathognomonic for ovarian torsion, confirming the diagnosis.



woman with torsed left ovarian mature cystic teratoma. Axial contrast-enhanced CT scan shows a thickened pedicle (arrow) between a left ovarian cystic mass (asterisk) and the left uterine cornu with helical swirling appearance, suggestive of a whirl sign.

Woman with torsed left ovarian mucinous cystadenoma. Axial contrast-enhanced CT scan shows a thickened pedicle (arrow) between the left uterine cornu and a pelvic mass (asterisk).

Reproduced from: Lee, M. S., Moon, M. H., Woo, H., Sung, C. K., Oh, S., Jeon, H. W., & Lee, T. S. (2018). CT findings of adnexal torsion: A matched case-control study. PLOS ONE, 13(7), e0200190. https://doi.org/10.1371/JOURNAL.PONE.0200190

CHAPTER OUTLINE:

章节大纲：

/ 卵巢扭转：CT

卵巢增大：卵巢通常表现为均匀性增大，并可能向中线偏移，这是扭转的常见征象。

脂肪条索影：邻近盆腔区域出现脂肪条索影及游离液体常提示扭转继发的炎症或出血。

血管蒂扭转：扭转的 CT 标志是可见扭转的卵巢蒂。CT 上显示的这种扭转蒂被视为卵巢扭转的特异性征象，可确诊该病。

左侧卵巢成熟囊性畸胎瘤扭转的女性患者。轴位增强 CT 扫描显示左侧卵巢囊性肿块（星号）与左子宫角之间可见增厚的血管蒂（箭头），呈螺旋状旋绕外观，提示漩涡征。

左侧卵巢黏液性囊腺瘤扭转女性患者。轴位增强 CT 扫描显示左子宫角与盆腔肿块（星号）之间可见增厚的血管蒂（箭头）。

来源：Lee, M. S., Moon, M. H., Woo, H., Sung, C. K., Oh, S., Jeon, H. W., & Lee, T. S. (2018). CT findings of adnexal torsion: A matched case-control study. PLOS ONE, 13(7), e0200190. https://doi.org/10.1371/JOURNAL.PONE.0200190

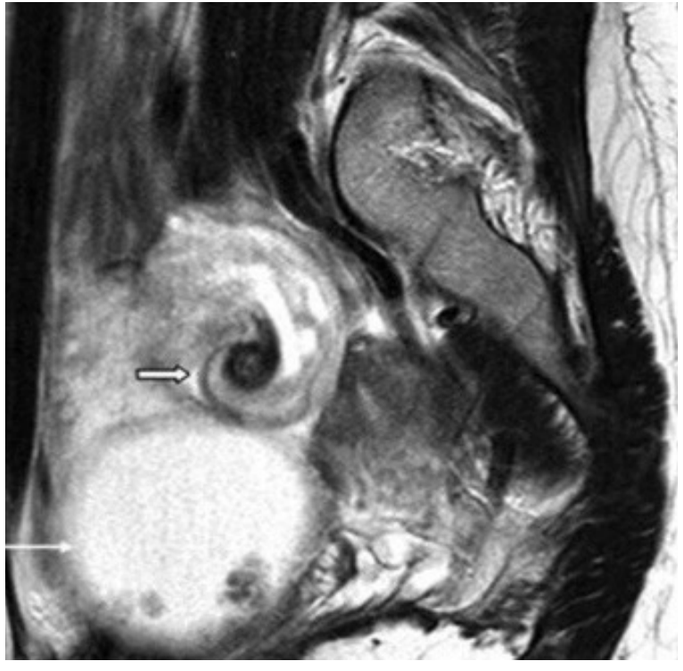
/ Ovarian Torsion: MRI

MRI is not the modality of choice for initial assessment of suspected ovarian, due to the need for expedited imaging. However, it can provide valuable information, particularly in complex cases.

Edema and Hemorrhage: T2-weighted imaging can reveal a hyperintense stroma, edema, while T1-weighted imaging can display a thin rim of high signal intensity characteristic of haemorrhagic infarction.

This rim of high signal is due to methemoglobin, which does not enhance with contrast, distinguishing it from endometriomas and haemorrhagic corpus luteal cysts that usually do not involve the entire ovary.

Vascular Flow: Despite not being the first-line imaging in acute settings, MRI can demonstrate the absence of blood flow within the twisted vascular pedicle, aiding in the confirmation of torsion.



T2-weighted, sagittal MR image showing "whirlpool appearance" of the right adnexa (thick arrow) suggestive of ovarian torsion. Right ovarian cystic mass is also seen (thin arrow)

Reproduced from: Ghonge, N. P., Lall, C., Aggarwal, B., & Bhargava, P. (2015). The MRI whirlpool sign in the diagnosis of ovarian torsion. Radiology case reports, 7(3), 731. https://doi.org/10.2484/rcr.v7i3.731

CHAPTER OUTLINE:

章节大纲：

/ 卵巢扭转：MRI

由于疑似卵巢扭转需要快速成像评估，MRI 并非初始检查的首选方式。但它可以提供有价值的信息，尤其是在复杂病例中。

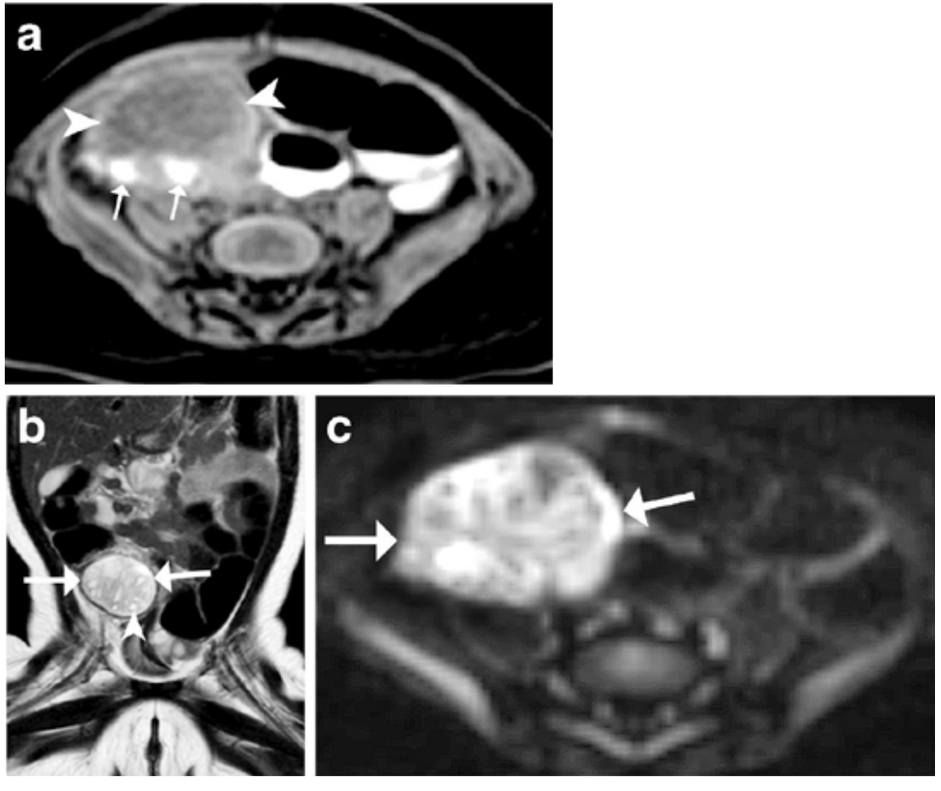
水肿和出血：T2 加权成像可显示高信号的卵巢基质（水肿），而 T1 加权成像可显示出血性梗死特征性的薄层高信号环。

该高信号环由高铁血红蛋白造成，其在使用对比剂时不增强，这使其可与通常不累及整个卵巢的子宫内膜异位囊肿及出血性黄体囊肿区分开来。

血流情况：虽然 MRI 不是急性扭转的一线影像学检查，但它可显示扭转的血管蒂内无血流信号，有助于证实扭转。

T2 加权矢状位 MR 图像显示右侧附件区“漩涡状表现”（粗箭头），提示卵巢扭转。同时可见右侧卵巢囊性肿块（细箭头）

来源：Ghonge, N. P., Lall, C., Aggarwal, B., & Bhargava, P. (2015). The MRI whirlpool sign in the diagnosis of ovarian torsion. Radiology case reports, 7(3), 731. https://doi.org/10.2484/rcr.v7i3.731



Typical appearance of ovarian torsion on MRI in a 4-month-old girl. a). Unenhanced axial T1-weighted fat-suppressed acquisition demonstrates haemorrhagic peripheral follicles (arrows) in the swollen and enlarged right ovary (arrowheads). b). Coronal T2-weighted image shows the enlarged right-side ovary (arrows) with small peripheral follicles (arrowhead). c). Axial diffusion-weighted image at b=1,000 demonstrates the diffusion impairment, inhomogenously distributed throughout the enlarged affected right ovary (arrows)

Reproduced from: Riccabona, M. et al . (2017). European Society of Paediatric Radiology abdominal imaging task force recommendations in paediatric uroradiology, part IX: Imaging in anorectal and cloacal malformation, imaging in childhood ovarian torsion, and efforts in standardising paediatric uroradiology terminology. Pediatric Radiology, 47(10), 1369–1380. https://doi.org/10.1007/S00247-017-3837-6/FIGURES

Imaging of the Female Pelvis

女性盆腔影像学

CHAPTER OUTLINE:

章节大纲：

1 例 4 月龄女婴卵巢扭转的典型 MRI 表现：a). 轴位 T1 加权脂肪抑制平扫图像显示，肿胀增大的右侧卵巢（箭头端）内可见出血性周边卵泡（箭头）。b). 冠状位 T2 加权图像显示，右侧卵巢增大（箭头），周边见小卵泡（箭头端）。c). b=1000 的轴位扩散加权图像显示，受累增大的右侧卵巢内存在扩散受限，呈不均匀分布（箭头）。

来源：Riccabona, M. et al. (2017).European Society of Paediatric Radiology abdominal imaging task force recommendations in paediatric uroradiology, part IX: Imaging in anorectal and cloacal malformation, imaging in childhood ovarian torsion, and efforts in standardising paediatric uroradiology terminology. Pediatric Radiology, 47(10), 1369–1380. https://doi.org/10.1007/S00247-017-3837-6/FIGURES

/ Endometrial Cancer

Endometrial cancer arises in the lining of the uterus (endometrium) and is one of the most common gynecological malignancies. Endometrial cancer is typically hormone-driven and often diagnosed in postmenopausal women. It may present with abnormal uterine bleeding, pelvic pain, or as an incidental finding.

The different types have varying histological features and clinical behaviors.

Types of Endometrial Cancer:

Endometrioid carcinoma: This is the most common type, often associated with estrogen exposure. It typically presents as an adenocarcinoma and is related to endometrial hyperplasia.

Serous carcinoma: Serous tumours are more aggressive and less common than endometrioid carcinomas. They are typically high-grade and may be associated with a worse prognosis.

Clear cell carcinoma: Clear cell carcinomas are characterised by clear cytoplasm and are less common. They often present at an advanced stage and have a poorer prognosis.

/ 子宫内膜癌

子宫内膜癌起源于子宫内膜，是最常见的妇科恶性肿瘤之一。子宫内膜癌通常由激素驱动，常见于绝经后女性。其症状可能表现为异常子宫出血、盆腔疼痛，或在检查中偶然发现。

不同类型的子宫内膜癌具有不同的组织学特征和临床表现。

子宫内膜癌的类型：

子宫内膜样癌：这是最常见的类型，通常与雌激素暴露有关。其典型表现为腺癌，且与子宫内膜增生相关。

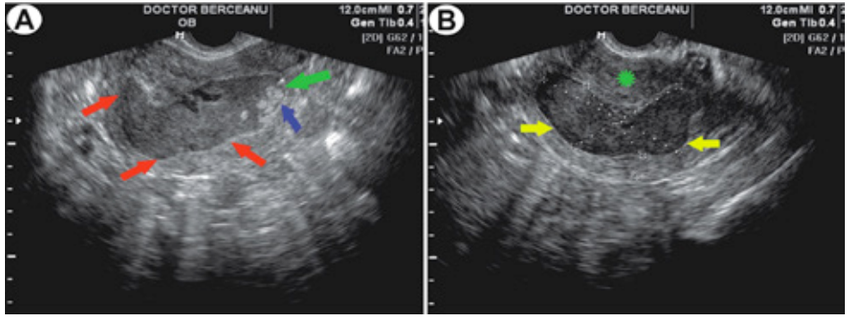
浆液性癌：浆液性肿瘤比子宫内膜样癌更具侵袭性，也更少见。这类肿瘤通常为高级别，预后可能较差。

透明细胞癌：透明细胞癌的特征是细胞质透明，比较少见。就诊时往往已是晚期，预后较差。

/ Endometrial Cancer: Ultrasound

On ultrasound, endometrial carcinoma typically manifests as endometrial thickening or a polypoid mass, with variation in premenopausal women depending on menstrual cycle timing and a threshold of **over 5 mm (or 8 mm with hormone therapy) in postmenopausal women**. Indicative sonographic features include **irregular thickening, polypoid lesions, fluid collections, and potential myometrial invasion**.

A disrupted sub-endometrial halo may also suggest myometrial involvement. If transvaginal ultrasound is inconclusive, sono-hysterography with saline distension can provide a clearer evaluation of the endometrium.



Endometrioid carcinoma: (A) Sagittal sonogram demonstrating severely enlarged uterine cavity (red arrows), heterogeneous echogenic mass (green arrow) on the rear wall of the uterine cavity, irregular outline, clear edges. Note hypoechogenic posterior band and the underlying formation (blue arrow) representing the peritumoral myometrium;(B) Sagittal sonogram demonstrating hematometra, with inhomogeneous, heterogeneous appearance, with anechogenic or hypoechogenic areas by tumour necrosis (yellow arrows). Note the intramural leiomyoma on the anterior uterine wall (green asterisk)

Reproduced from: Berceanu, C. et al. (2016). Morphological, imaging and surgical aspects in endometrial endometrioid adenocarcinoma. Romanian journal of morphology and embryology = Revue roumaine de morphologie et embryologie, 57(3), 995–1002.

Imaging of the Female Pelvis

/ 女性盆腔影像学

/ 子宫内膜癌：超声

CHAPTER OUTLINE:

章节大纲：

在超声检查中，子宫内膜癌通常表现为子宫内膜增厚或息肉样肿块，绝经前女性的表现因月经周期时间而异，**而绝经后女性的诊断阈值为子宫内膜厚度超过 5 mm（接受激素治疗者为 8 mm）**。超声特征性表现包括**不规则增厚、息肉样病变、积液和可能存在的肌层浸润**。

子宫内膜下光环征中断也可能提示肌层受累。如果经阴道超声检查结果不明确，可通过生理盐水宫腔灌注超声造影更清晰地评估子宫内膜。

子宫内膜样癌：(A) 矢状位声像图显示子宫腔严重增大（红色箭头），宫腔后壁见不均质高回声肿块（绿色箭头），轮廓不规则，边界清晰。注意低回声后带及其下方代表肿瘤周围肌层的结构（蓝色箭头）；(B) 矢状位声像图显示子宫积血，表现为不均匀的异质性外观，可见因肿瘤坏死形成的无回声或低回声区域（黄色箭头）。注意子宫前壁的壁间平滑肌瘤（绿色星号）

来源：Berceanu, C. et al. (2016). Morphological, imaging and surgical aspects in endometrial endometrioid adenocarcinoma. Romanian journal of morphology and embryology = Revue roumaine de morphologie et embryologie, 57(3), 995–1002.

/ Endometrial Cancer: CT

While limited in the initial diagnosis, CT is valuable for detecting metastatic spread, particularly in the lungs and liver, which are common sites for distant disease in advanced endometrial cancer. CT may show uterine enlargement or hypoattenuating mass with irregular endometrial thickening, especially in more advanced stages.

CT scan of the abdomen reveals a uterus (U) with dilated cavity (arrow) on top of the dilated cervix (C). surgical staging was completed by omentectomy and lymph node dissection. Histological examination of the specimens revealed grade I adenocarcinoma of the uterus located in the fundus with more than two thirds myometrial invasion

Reproduced from: Tannus, S., & Atlas, I. (2009). Endometrial cancer presenting as acute urinary retention: A case report and review of the literature. Cases Journal, 2(12), 1–3. https://doi.org/10.1186/1757-1626-2-9388/FIGURES/2

/ 子宫内膜癌：CT

CHAPTER OUTLINE:

章节大纲：

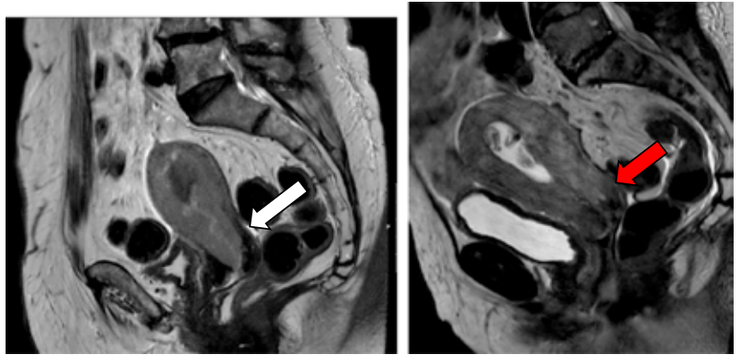
尽管 CT 在初始诊断中的作用有限，但对于检测转移性扩散（尤其是晚期子宫内膜癌常见的远处转移部位，如肺和肝）具有重要价值。CT 可能显示子宫增大或低密度肿块伴子宫内膜不规则增厚，尤其是在更晚期阶段。

腹部 CT 扫描显示子宫 (U) 宫腔扩张（箭头），位于扩张的宫颈 (C) 上方。通过网膜切除术和淋巴结清扫完成手术分期。标本组织学检查显示子宫底 I 级腺癌，伴超过三分之二肌层浸润

来源：Tannus, S., & Atlas, I. (2009). Endometrial cancer presenting as acute urinary retention: A case report and review of the literature. Cases Journal, 2(12), 1–3. https://doi.org/10.1186/1757-1626-2-9388/FIGURES/2

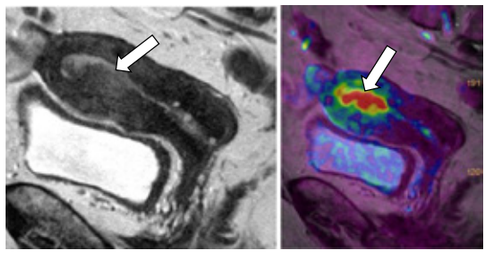
/ Endometrial Cancer: MRI

MRI is the preferred method for staging endometrial cancer, with a dedicated pelvic protocol enhancing local staging accuracy. It shows the tumour as hypo- to isointense on T1, less enhanced than the normal endometrium in post-gadolinium, and heterogeneous on T2. DWI sequences highlight restricted diffusion, aiding in assessing myometrial invasion.



Endometrial cancers visualised by sagittal T2WI. a No cervical invasion; cervical stromal is preserved (white arrow). b Direct cervical invasion; cervical stroma is invaded (red arrow)

Reproduced from: Otero-García, M. et al(2019). Role of MRI in staging and follow-up of endometrial and cervical cancer: pitfalls and mimickers. Insights into Imaging, 10(1), 1–22. https://doi.org/10.1186/S13244-019-0696-8/FIGURES/25



FIGO IA endometrial tumor (arrows) with myometrial invasion of < 50% is isointense in T2WI images (a) and well-delineated in fused T2WIDWI images (b)

Reproduced from: Otero-García, M. et al(2019). Role of MRI in staging and follow-up of endometrial and cervical cancer: pitfalls and mimickers. Insights into Imaging, 10(1), 1–22. https://doi.org/10.1186/S13244-019-0696-8/FIGURES/25

CHAPTER OUTLINE:

章节大纲：

/ 子宫内膜癌：MRI

MRI 是子宫内膜癌分期的首选方法，其专用的盆腔扫描方案可提高局部分期的准确性。肿瘤在 T1 加权像上呈低至等信号，钆剂注射后的强化程度低于正常子宫内膜，T2 加权像呈混杂信号。DWI 序列可显示扩散受限，有助于评估子宫肌层浸润情况。

矢状位 T2WI 显示的子宫内膜癌。a 无宫颈浸润；宫颈基质完整（白色箭头）；b 直接宫颈浸润，宫颈基质被侵犯（红色箭头）

来源：Otero-García, M. et al(2019). Role of MRI in staging and follow-up of endometrial and cervical cancer: pitfalls and mimickers. Insights into Imaging, 10(1), 1–22. https://doi.org/10.1186/S13244-019-0696-8/FIGURES/25

国际妇产科联盟 (FIGO) IA 期子宫内膜癌肿瘤（箭头），肌层浸润深度 < 50%，在 T2WI 图像 (a) 上呈等信号，在 T2WI 与 DWI 融合图像 (b) 上轮廓清晰

来源：Otero-García, M. et al(2019). Role of MRI in staging and follow-up of endometrial and cervical cancer: pitfalls and mimickers. Insights into Imaging, 10(1), 1–22. https://doi.org/10.1186/S13244-019-0696-8/FIGURES/25

/ Ovarian Cancer

Ovarian cancer is often called the "silent killer" because it can progress without symptoms until it reaches an advanced stage. Symptoms may include abdominal pain, bloating, menstrual irregularities and changes in bowel or urinary habits. Ovarian cancers are typically categorised into three main groups based on their cell type and origin. These groups are:

Epithelial Tumours: These are the most common ovarian cancers, arising from the epithelium or the outer surface of the ovary. Epithelial tumours include several subtypes such as serous, mucinous, endometrioid, and clear cell carcinomas.

Germ Cell Tumours: These originate from the cells that produce the ova (eggs). Although they are much less common than epithelial tumours, germ cell tumours tend to occur in younger women. The subtypes include teratomas, dysgerminomas, and endodermal sinus tumours.

Stromal Tumours: These arise from connective tissue cells that hold the ovary together and produce the female hormones estrogen and progesterone. This type of cancer is often found in the early stages. Vaginal bleeding is one of the most common examples of stromal tumours include granulosa cell tumors and Sertoli-Leydig cell tumours.

/ 卵巢癌

CHAPTER OUTLINE:

章节大纲：

卵巢癌通常被称为“无声的杀手”，因为它在进展至晚期前可能无明显症状。症状可能包括腹痛、腹胀、月经不规则以及排便或排尿习惯改变。根据细胞类型和起源，卵巢癌通常分为三大类。包括：

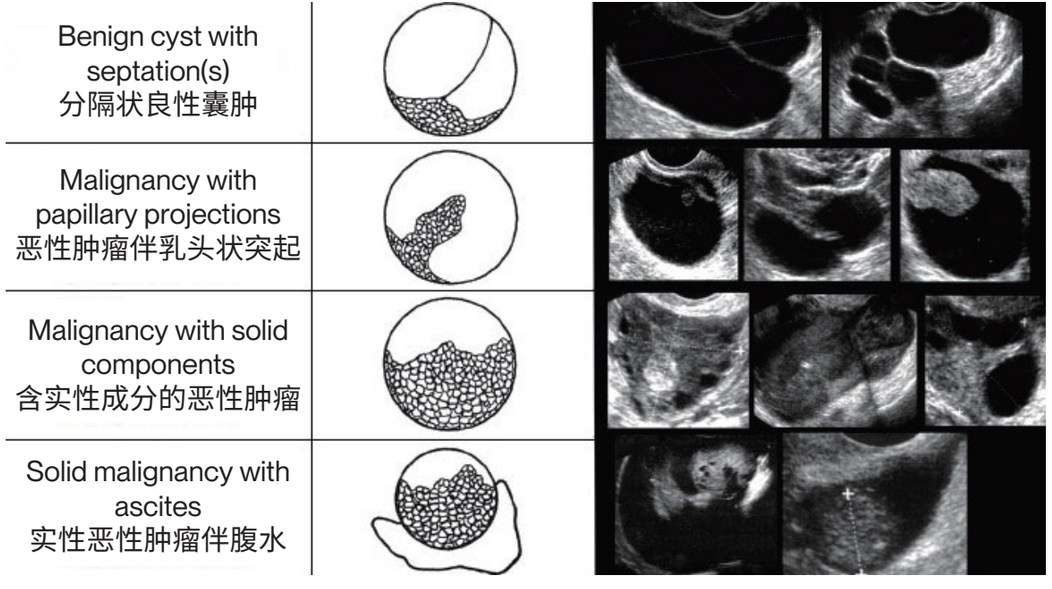
上皮性肿瘤：这是最常见的卵巢癌类型，起源于卵巢上皮（即卵巢的外层表面）。上皮性肿瘤包括浆液性癌、黏液性癌、子宫内膜样癌和透明细胞癌等多个亚型。

生殖细胞肿瘤：这类肿瘤起源于产生卵子（卵细胞）的细胞。尽管生殖细胞肿瘤比上皮性肿瘤少见得多，但其多发于年轻女性。亚型包括畸胎瘤、无性细胞瘤和内胚窦瘤。

间质肿瘤：这类肿瘤起源于维持卵巢结构并产生雌激素和孕激素等女性激素的结缔组织细胞。此类癌症通常在早期阶段即可被发现。阴道出血是间质肿瘤最常见的症状之一，该类肿瘤包括颗粒细胞瘤和支持间质细胞瘤。

/ Ovarian Cancer: Ultrasound

Ovarian cancer may present as complex cystic masses with papillary projections or solid components. Colour Doppler may reveal increased vascularity within the tumour.



Sonographic images of benign and malignant ovarian morphology. increasing morphologic complexity is noted from top to bottom

Reproduced from: van Nagell, J. R., Jr, & Hoff, J. T. (2013). Transvaginal ultrasonography in ovarian cancer screening: current perspectives. International journal of women's health, 6, 25–33.

CHAPTER OUTLINE:

章节大纲：

/ 卵巢癌：超声

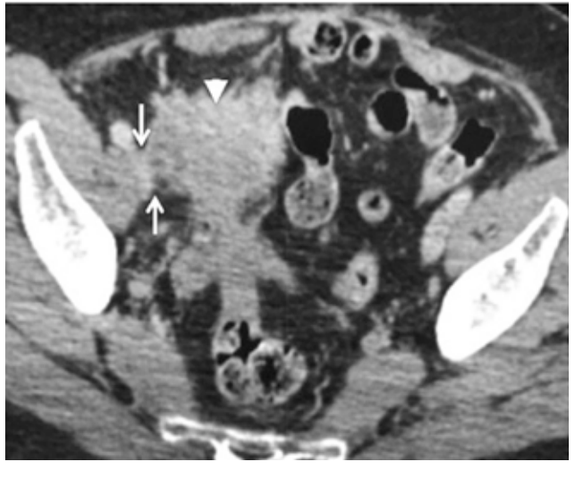
卵巢癌可能表现为伴有乳头状突起或实性成分的复杂性囊性肿块。彩色多普勒检查可能显示肿瘤内血流信号增多。

卵巢良性与恶性形态的声像图：自上至下可见形态复杂性逐渐增加

来源：van Nagell, J. R., Jr, & Hoff, J. T. (2013). Transvaginal ultrasonography in ovarian cancer screening: current perspectives. International journal of women's health, 6, 25–33.

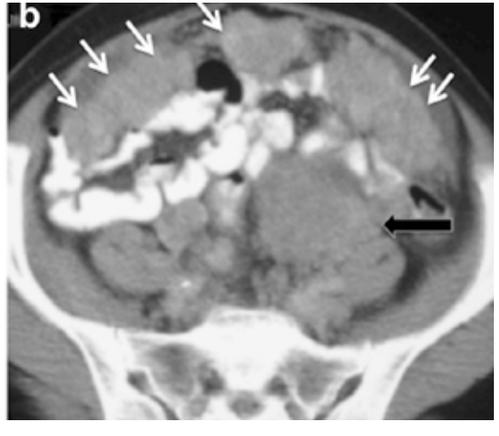
/ Ovarian Cancer: CT

Often shows ovarian enlargement with irregular cystic and solid areas. Ascites, omental caking, and peritoneal involvement may be present in advanced cases.



Right sided malignant ovarian mass (arrowhead). The mass extends to the right pelvic side wall and abuts the right external iliac vein (arrows). A distance of less than 3 mm from the pelvic side wall structures is highly suggestive of invasion.

Reproduced from: Sahdev A. (2016). CT in ovarian cancer staging how to review and report with emphasis on abdominal and pelvic disease for surgical planning. Cancer imaging : the official publication of the International Cancer Imaging Society, 16(1), 19. https://doi.org/10.1186/s40644-016-0076-2



Undifferentiated adenocarcinoma of the ovary. The dashed arrows show extensive diffuse meso colic disease posterior to the transverse colon confluent with diffuse small bowel serosal disease. The disease results in small bowel obstruction. Solid arrows show a typical thick omental cake in the lower abdomen and a large peritoneal deposit (black arrow).

Reproduced from: Sahdev A. (2016). CT in ovarian cancer staging how to review and report with emphasis on abdominal and pelvic disease for surgical planning. Cancer imaging : the official publication of the International Cancer Imaging Society, 16(1), 19. https://doi.org/10.1186/s40644-016-0076-2

/ Imaging of the Female Pelvis

/ 女性盆腔影像学

/ 卵巢癌：CT

常表现为卵巢增大，伴不规则囊性和实性区域。晚期病例可能出现腹水、大网膜饼状增厚及腹膜受累。

CHAPTER OUTLINE:

章节大纲：

右侧卵巢恶性肿块（箭头端）。肿块延伸至右侧盆腔侧壁并紧邻右侧髂外静脉（箭头）。与盆腔侧壁结构的距离小于 3 mm 高度提示浸润。

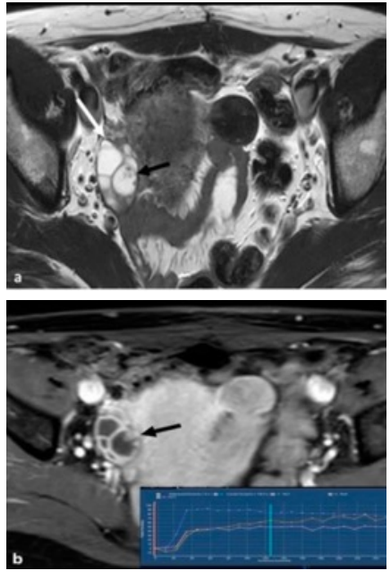
来源：Sahdev A. (2016). CT in ovarian cancer staging how to review and report with emphasis on abdominal and pelvic disease for surgical planning. Cancer imaging : the official publication of the International Cancer Imaging Society, 16(1), 19. https://doi.org/10.1186/s40644-016-0076-2

卵巢未分化腺癌。虚线箭头显示横结肠后方广泛弥漫性结肠系膜病变，与弥漫性小肠浆膜病变融合。该病变导致小肠梗阻。实心箭头显示下腹部典型增厚的大网膜饼状病灶及大块腹膜沉积物（黑色箭头）。

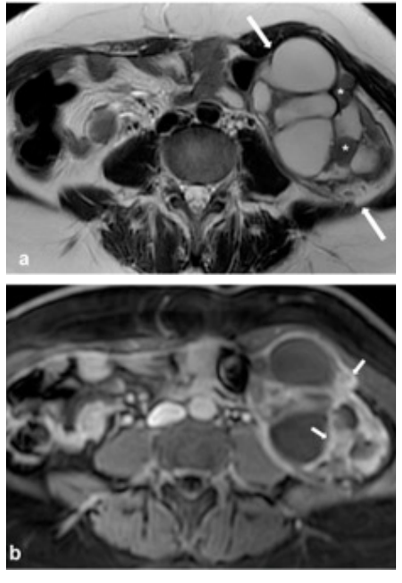
来源：Sahdev A. (2016).CT in ovarian cancer staging how to review and report with emphasis on abdominal and pelvic disease for surgical planning.Cancer imaging : the official publication of the International Cancer Imaging Society, 16(1), 19.https://doi.org/10.1186/s40644-016-0076-2

/ Ovarian Cancer: MRI

MRI findings suggestive of malignancy include the demonstration of solid masses, solid/cystic masses and the presence of papillary projections (vegetations) and thick septa in a cystic lesion. Secondary features of malignancy are: peritoneal, mesenteric or omental involvement, pelvic side wall invasion and lymphadenopathy. Diffusion-weighted imaging (DWI) can aid in characterizing lesions.



Serous epithelial borderline ovarian tumour. Axial T2 weighted image (a) shows a multiloculated cystic lesion at the right ovary (white arrow). A small, papillary projection (black arrow) is present, with avid enhancement on the T1 weighted FS CE image ((b), black arrow). An intermediate-risk time intensity curve (TIC type 2) was detected on DCE image analysis (inset in b, blue line: myometrium, orange/pink lines: papillary projection.



Low grade serous cystadenocarcinoma. Axial T2 weighted image (a) shows a multiloculated, predominantly cystic mass at the left ovary (white arrows) with solid tissue (asterisks) showing avid enhancement on the T1 weighted FS CE image ((b), white arrows).

All images on this page are reproduced from: Bourgioti, C., Konidari, M., & Moulopoulos, L. A. (2023). Manifestations of Ovarian Cancer in Relation to Other Pelvic Diseases by MRI. Cancers 2023, Vol. 15, Page 2106, 15(7), 2106. https://doi.org/10.3390/CANCERS15072106

Imaging of the
/ Female **Pelvis**

/ 女性**盆腔**影像学

/ 卵巢癌：MRI

CHAPTER OUTLINE:

章节大纲：

提示恶性肿瘤的 MRI 表现包括：显示实性肿块、实性/囊性肿块，以及囊性病变中存在乳头状突起（赘生物）和厚分隔。恶性肿瘤的次要特征包括：腹膜、肠系膜或大网膜受累，盆腔侧壁侵犯及淋巴结肿大。扩散加权成像（Diffusion-weighted imaging，DWI）有助于病变的定性诊断。

浆液性上皮性卵巢交界性肿瘤。轴位 T2 加权图像 (a) 显示右侧卵巢多房囊性病变（白色箭头）。可见小的乳头状突起（黑色箭头），在 T1 加权脂肪抑制增强 (FS CE) 图像上呈明显强化（(b)，黑色箭头）。在动态对比增强 (DCE) 图像分析中检测到中风险时间-强度曲线（TIC 2 型）（图 b 插图，蓝线：子宫肌层，橙/粉线：乳头状突起）。

低级别浆液性囊腺癌。轴位 T2 加权图像 (a) 显示左卵巢多房性、以囊性为主的肿块（白色箭头），实性组织（星号）在 T1 加权 FS CE 图像上呈明显强化（(b)，白色箭头）。

本页所有图片均源于：
Bourgioti, C., Konidari, M., & Moulopoulos, L. A. (2023). Manifestations of Ovarian Cancer in Relation to Other Pelvic Diseases by MRI. Cancers 2023, Vol. 15, Page 2106, 15(7), 2106. https://doi.org/10.3390/CANCERS15072106

/ Cervical Cancer

Cervical cancer is often associated with human papillomavirus (HPV) infection. It may present with abnormal vaginal bleeding, vaginal discharge, pelvic pain, or as an abnormal Pap smear result. The different histological types have distinct characteristics and clinical behaviours.

Two main types of cervical cancer are:

Squamous cell carcinoma:
This is the most common type and arises from the squamous epithelial cells of the cervix.

Adenocarcinoma:
Adenocarcinoma of the cervix arises from glandular cells and tends to be diagnosed at a more advanced stage.

/ **Imaging** of the Female **Pelvis**

/ 女性**盆腔**影像学

/ 宫颈癌

CHAPTER OUTLINE:

章节大纲：

宫颈癌通常与人乳头瘤病毒（human papillomavirus，HPV）感染有关。其症状可能表现为异常阴道出血、阴道分泌物、盆腔疼痛或巴氏涂片结果异常。不同组织学类型的宫颈癌具有独特的特征和临床表现。

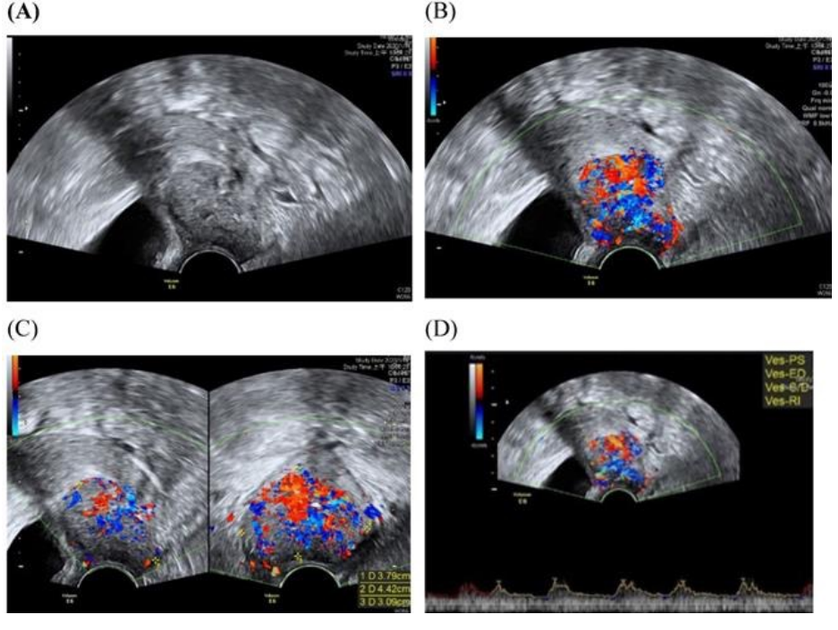
宫颈癌的两种主要类型为：

鳞状细胞癌：
这是最常见的类型，起源于宫颈鳞状上皮细胞。

腺癌：
宫颈腺癌起源于腺细胞，诊断时往往已处于较晚期。

/ Cervical Cancer: Ultrasound

On ultrasound, cervical cancer presents as a hypoechoic and heterogeneous mass in the cervix, often with increased blood flow on colour Doppler imaging. Ultrasound serves as an adjunct to clinical staging, providing details on the tumour's size, its spread to the parametrium and vagina, invasion into nearby organs, and the presence of hydronephrosis, which can indicate a more advanced stage.



Transvaginal ultrasound image gray scale and color Doppler shows a longitudinal section of the uterus with cervical cancer (A) Grey scale shows cervical mass (B) colour Doppler shows abundant blood flow in cervical mass (C) colour Doppler (D) colour Doppler Blood flow

Reproduced from: Hsiao, Y. H., Yang, S. F., Chen, Y. H., Chen, T. H., Tsai, H. D., Chou, M. C., & Chou, P. H. (2021). Updated applications of Ultrasound in Uterine Cervical Cancer. Journal of Cancer, 12(8), 2181–2189. https://doi.org/10.7150/jca.49479

CHAPTER OUTLINE:

章节大纲：

/ 宫颈癌：超声

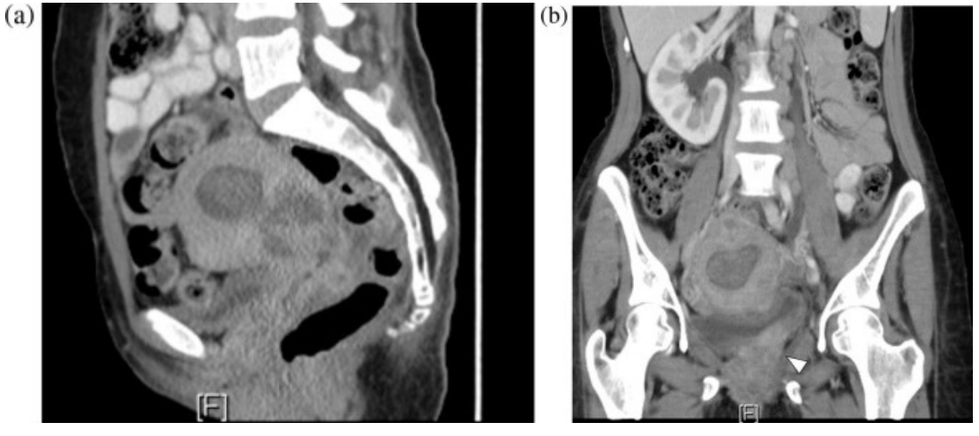
在超声检查中，宫颈癌表现为宫颈内低回声且回声不均的肿块，彩色多普勒成像常显示肿块内血流信号增多。超声检查可作为临床分期的辅助手段，提供以下细节信息：肿瘤大小、向宫旁组织和阴道的扩散情况、对邻近器官的侵犯，以及是否存在肾积水（提示肿瘤可能已处于更晚期阶段）。

经阴道超声灰阶及彩色多普勒图像显示宫颈癌子宫纵切面：(A) 灰阶图像显示宫颈肿块；(B) 彩色多普勒显示宫颈肿块内血流丰富；(C) 彩色多普勒；(D) 彩色多普勒血流

来源： Hsiao, Y. H., Yang, S. F., Chen, Y. H., Chen, T. H., Tsai, H. D., Chou, M. C., & Chou, P. H. (2021). Updated applications of Ultrasound in Uterine Cervical Cancer. Journal of Cancer, 12(8), 2181–2189. https://doi.org/10.7150/jca.49479

/ Cervical Cancer: CT

In cervical cancer, CT is less effective for evaluating the primary tumour but is valuable for assessing advanced disease. Its primary role lies in detecting lymphadenopathy and defining the extent of advanced disease, including distant metastases. CT is also instrumental in planning radiation therapy and guiding percutaneous biopsies. On CT scans, the primary cervical tumor may appear as hypo-enhancing or iso-enhancing relative to the normal cervical stroma.



41-year-old patient with a history of premenopausal bleeding of 6-month duration. Sagittal (A) and coronal images (B). (A) Heterogenous hypoattenuating cervical mass is seen extending to fundus. (B) Together with infiltration of the bladder from its inferior aspect causing enhancement of bladder wall (arrow).

Reproduced from : Helal, M. H., Mostafa, A. M., Mansour, S. M., Noaman, M. K., & Beshir, M. M. R. (2017). Loco-regional staging of cervical carcinoma: Is there a place for Multidetector CT? The Egyptian Journal of Radiology and Nuclear Medicine, 48(1), 307–311. https://doi.org/10.1016/J.EJRNM.2016.11.006

/ 宫颈癌：CT

在宫颈癌中，CT 对原发性肿瘤的评估效果较差，但对评估晚期疾病具有重要价值。其主要作用在于检测淋巴结病变、明确晚期病变范围（包括远处转移）。CT 也可用于放疗计划制定和经皮活检引导。在 CT 扫描中，宫颈原发肿瘤相对于正常宫颈基质可能表现为低强化或等强化。

CHAPTER OUTLINE:

章节大纲：

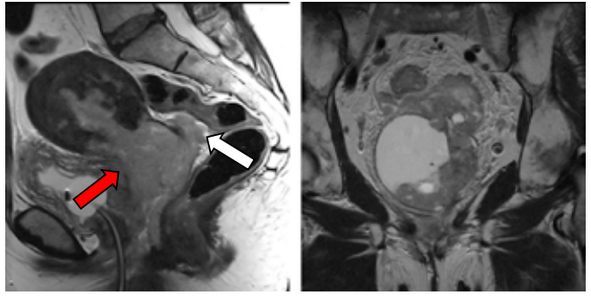
41 岁患者，有 6 个月绝经前出血史。矢状位 (A) 和冠状位图像 (B)。(A) 宫颈见不均质低密度肿块，向上延伸至宫底。(B) 肿块下缘侵犯膀胱，导致膀胱壁强化（箭头）。

来源：Helal, M. H., Mostafa, A. M., Mansour, S. M., Noaman, M. K., & Beshir, M. M. R. (2017). Loco-regional staging of cervical carcinoma: Is there a place for Multidetector CT? The Egyptian Journal of Radiology and Nuclear Medicine, 48(1), 307–311. https://doi.org/10.1016/J.EJRNM.2016.11.006

/ Cervical Cancer: MRI

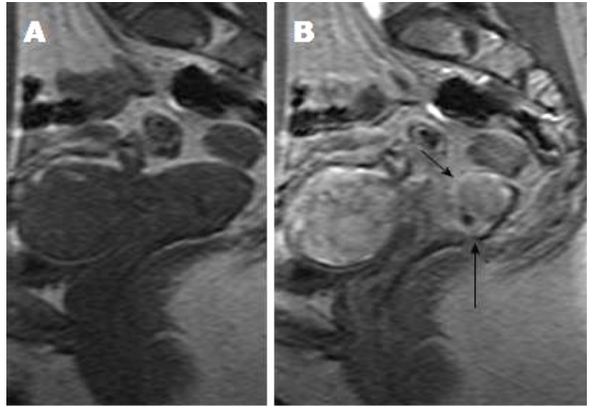
The tumour typically appears isointense to pelvic muscles on T1-weighted images, but on T2-weighted images, it is hyperintense against the low signal of the normal cervical stroma. This high signal on T2 is consistent across histological subtypes.

While contrast-enhanced MRI is not routinely necessary, it can be particularly useful for identifying smaller tumours. The tumour usually appears as a higher signal when compared to the lower signal of the cervical stroma on T1-weighted images.



FIGO Stage IVA cervical cancer with bladder invasion. Visualisation by sagittal T2WI (a) and coronal T2WI (b) reveals cervical cancer invading the bladder mucosa (red arrow) and rectouterine space (white arrow)

Reproduced from: Otero-García, M et al. (2019). Role of MRI in staging and follow-up of endometrial and cervical cancer: pitfalls and mimickers. Insights into Imaging, 10(1), 1–22. https://doi.org/10.1186/S13244-019-0696-8/FIGURES/25



Dynamic contrast enhanced images, cervical cancer. Sagittal pre- (A) and early arterial (30 s) post contrast (B) images. Cervical tumour borders are clearly delineated on the enhanced image (arrows in B). Note early arterial enhancement of cervical tumour in (B) synchronous with that of myometrium.

Reproduced from: Bourgioti, C., Chatoupis, K., & Moulopoulos, L. A. (2016). Current imaging strategies for the evaluation of uterine cervical cancer. World journal of radiology, 8(4), 342–354. https://doi.org/10.4329/wjr.v8.i4.342

Imaging of the
/ Female Pelvis

/ 女性盆腔影像学

CHAPTER OUTLINE:

章节大纲：

/ 宫颈癌：MRI

在 T1 加权图像上，肿瘤通常表现为与盆腔肌肉等信号，但在 T2 加权图像上，相对于正常宫颈基质的低信号，肿瘤呈高信号。这种 T2 高信号在各组织学亚型中一致存在。

尽管对比剂增强 MRI 并非常规必需，但对识别较小肿瘤尤其有用。在 T1 加权图像上，肿瘤信号通常高于宫颈基质的低信号。

FIGO IVA 期宫颈癌伴膀胱侵犯。矢状位 T2WI (a) 和冠状位 T2WI (b) 显示宫颈癌侵犯膀胱黏膜（红色箭头）和直肠子宫陷凹（白色箭头）

来源： Otero-García, M et al. (2019). Role of MRI in staging and follow-up of endometrial and cervical cancer: pitfalls and mimickers.Insights into Imaging, 10(1), 1–22.https://doi.org/10.1186/S13244-019-0696-8/FIGURES/25

宫颈癌动态对比增强图像。矢状位增强前 (A) 及动脉早期（30 秒）增强后 (B) 图像。增强图像上宫颈肿瘤边界清晰（B 图箭头所示）。注意 (B) 中宫颈肿瘤与子宫肌层同步出现动脉早期强化。

来源： Bourgioti, C., Chatoupis, K., & Moulopoulos, L. A. (2016). Current imaging strategies for the evaluation of uterine cervical cancer. World journal of radiology, 8(4), 342–354. https://doi.org/10.4329/wjr.v8.i4.342

Common Disorders Associated with Pregnancy and Delivery

CHAPTER OUTLINE:

章节大纲：

与妊娠和分娩相关的常见疾病

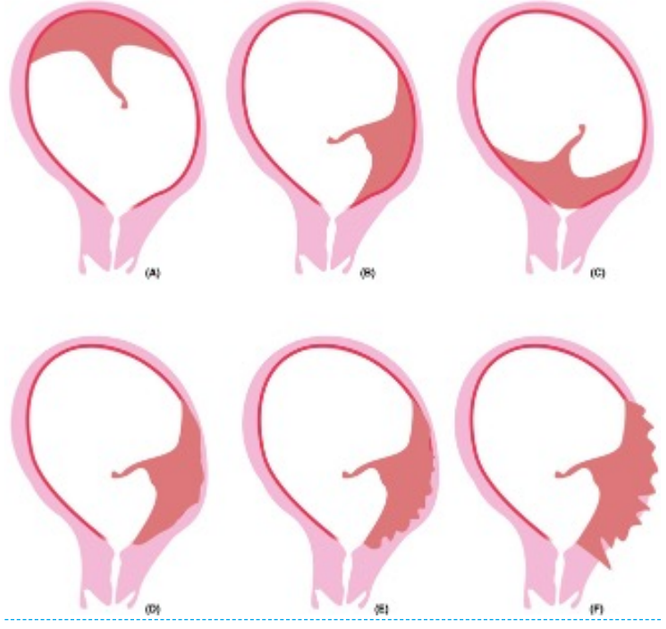
/ Placental Abnormalities

Placental abnormalities can occur during pregnancy and may lead to complications.

Types:

Placenta Previa: In this condition, the placenta partially or completely covers the cervix. It can result in painless vaginal bleeding during the second or third trimester.

Placenta Accreta, Increta and Percreta: In placenta accreta, the placenta attaches firmly to the uterine wall but does not penetrate the muscle. Placenta increta occurs when the placenta invades into the myometrium, and in placenta percreta, the most severe form, the placenta perforates through the myometrium and may extend to nearby organs.



Placental abnormalities in location and anatomy: (A) normal localisation, (B) low-lying placenta, (C) placenta previa, (D) placenta accreta, (E) placenta increta, (F) placenta percreta

Reproduced from: Jansen, C. H. J. R et al .(2020). Development of placental abnormalities in location and anatomy. Acta obstetricia et gynecologica Scandinavica, 99(8), 983–993. https://doi.org/10.1111/aogs.13834

CHAPTER OUTLINE:

/ 胎盘异常

孕期可能发生的胎盘异常及并发症。

类型：

前置胎盘：在这种情况下，胎盘部分或完全覆盖宫颈。在妊娠中期或晚期，它可能导致无痛阴道出血。

粘连性胎盘、植入性胎盘和穿透性胎盘：在粘连性胎盘中，胎盘牢固附着于子宫壁，但未穿透肌层。当胎盘侵入子宫肌层时，就会形成植入性胎盘。在穿透性胎盘中，胎盘会穿透子宫肌层并可能延伸至邻近器官，这是最严重的类型。

胎盘位置及解剖异常类型：(A) 正常位置，(B) 低置胎盘，(C) 前置胎盘，(D) 胎盘粘连，(E) 胎盘植入，(F) 穿透性胎盘

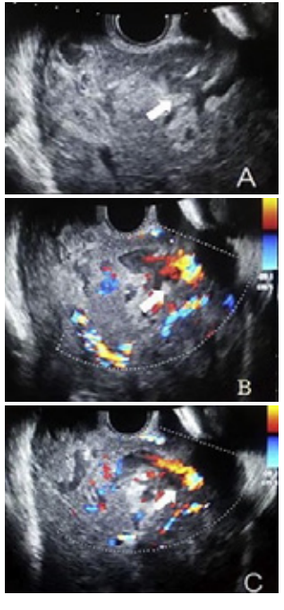
来源：Jansen, C. H. J. R et al .(2020). Development of placental abnormalities in location and anatomy. Acta obstetricia et gynecologica Scandinavica, 99(8), 983–993. https://doi.org/10.1111/aogs.13834

/ Placental Abnormalities: Ultrasound

Ultrasound imaging can detect placenta previa and may show placental lacunae, which appear as irregular vascular channels with turbulent flow, creating a "Swiss cheese" appearance. It may also show abnormal Doppler flow, loss of the retroplacental clear space, and notably thin myometrium, sometimes less than 1 mm.

Transvaginal ultrasound presentation of a placenta previa totalis et percreta at 34 weeks gestation with a small tissue layer (arrow) towards the urinary bladder

Reproduced from: Bachmann, C., Abele, H., & Hoopmann, M. (2023). Placenta Previa et Percreta: A Potentially Life-Threatening Condition. Diagnostics (Basel, Switzerland), 13(3), 539. https://doi.org/10.3390/diagnostics13030539



Placenta accreta.
(A) Grey scale transvaginal: Arrow shows placental lacunae. (B) Colour Doppler of the same region shows turbulent flow of venous, arterial or mixed blood. (C) Colour Doppler of the same region shows Tornado sign (arrow).

Reproduced from: Shawky, M., AbouBieh, E., & Masood, A. (2016). Gray scale and Doppler ultrasound in placenta accreta: Optimization of ultrasound signs. The Egyptian Journal of Radiology and Nuclear Medicine, 47(3), 1111–1115. https://doi.org/10.1016/J.EJRNM.2016.04.010

Imaging of the
/ Female
Pelvis

/ 女性盆腔影像学

CHAPTER OUTLINE:

章节大纲：

/ 胎盘异常：超声

超声成像可检测前置胎盘，并可能显示胎盘血窦，表现为伴有湍流的不规则血管通道，形成“瑞士奶酪”样外观。还可能显示异常多普勒血流、胎盘后清晰间隙消失，以及明显变薄的子宫肌层（有时厚度不足 1 mm）。

胎盘粘连。

(A) 经阴道灰阶超声：箭头所示为胎盘血窦。(B) 同一区域彩色多普勒显示静脉、动脉或混合血流的湍流。(C) 同一区域彩色多普勒显示“龙卷风征”（箭头）。

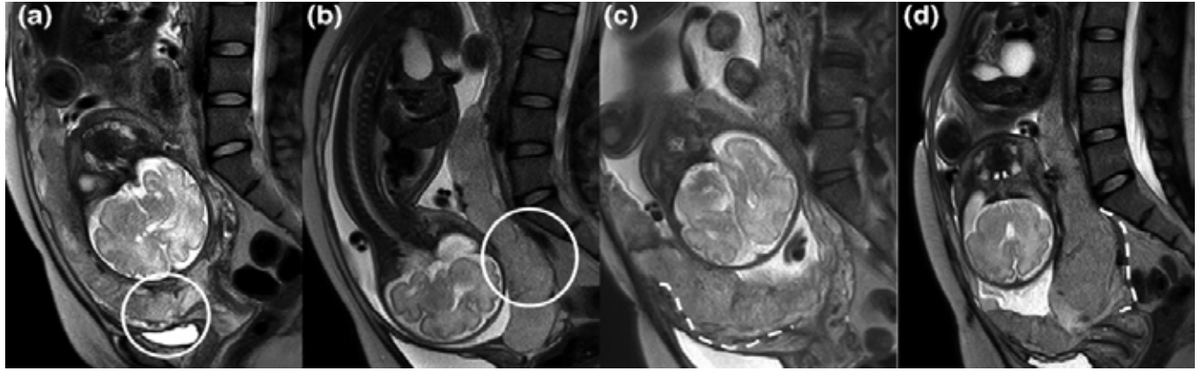
来源：Shawky, M., AbouBieh, E., & Masood, A. (2016). Gray scale and Doppler ultrasound in placenta accreta: Optimization of ultrasound signs. The Egyptian Journal of Radiology and Nuclear Medicine, 47(3), 1111–1115. https://doi.org/10.1016/J.EJRNM.2016.04.010

孕 34 周完全性前置胎盘合并穿透性胎盘的经阴道超声表现：朝向膀胱方向可见肌层变薄（箭头）

来源：Bachmann, C., Abele, H., & Hoopmann, M. (2023). Placenta Previa et Percreta: A Potentially Life-Threatening Condition. Diagnostics (Basel, Switzerland), 13(3), 539. https://doi.org/10.3390/diagnostics13030539

/ Placental Abnormalities: MRI

Using standardised SAR/ESUR protocols, MRI without contrast is performed with T2-weighted and fat-suppressed T1-weighted sequences to detect signs of abnormal placental invasion. Key features include a bulging placenta, uterine contour changes, placental tissue within the bladder area, heterogeneous myometrial vessels, and thinning of the myometrium. Optional sequences like DWI/ADC can provide additional detail on placental vascularity.



Representative findings of myometrial interruption and focal uterine bulging in patients with placenta accreta spectrum. (A) Sagittal T2-weighted images showing focal myometrial interruption (empty oval) in the anterior placenta of a patient with placenta increta. (B) Sagittal T2-weighted images showing focal myometrial thinning (empty oval) in the posterior placenta of a patient with placenta accreta. (C) Sagittal T2-weighted images showing focal uterine bulging (broken line) in the anterior placenta of a patient with placenta percreta. (D) Sagittal T2-weighted images showing focal uterine bulging (broken line) in the posterior placenta of a patient with placenta accreta

Reproduced from: Bachmann, C., Abele, H., & Hoopmann, M. (2023). Placenta Previa et Percreta: A Potentially Life-Threatening Condition. Diagnostics (Basel, Switzerland), 13(3), 539. https://doi.org/10.3390/diagnostics13030539

CHAPTER OUTLINE:

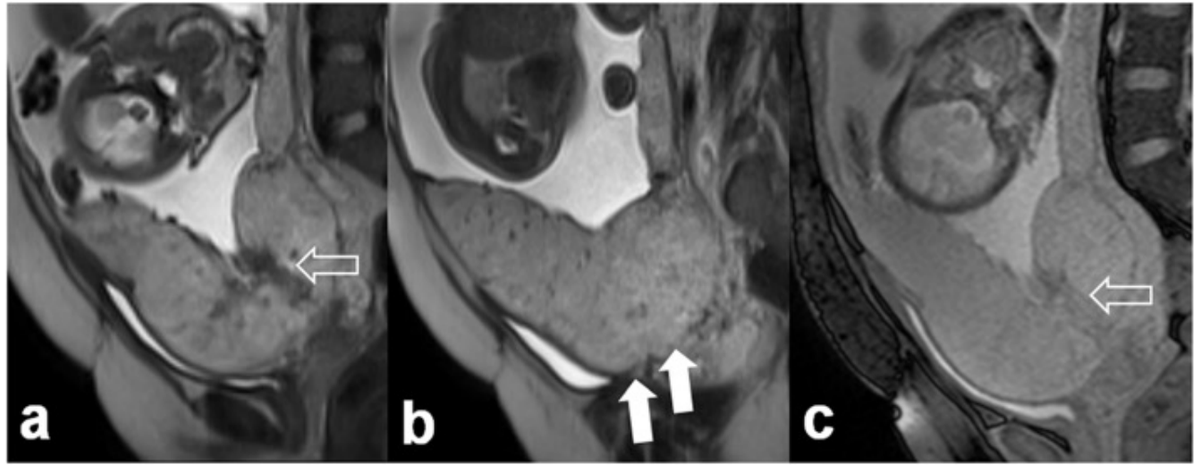
章节大纲：

/ 胎盘异常：MRI

使用标准化 SAR/ESUR 方案，通过 T2 加权和脂肪抑制 T1 加权序列进行非增强 MRI，以检测胎盘异常植入的迹象。关键特征包括胎盘膨出、子宫轮廓改变、胎盘组织植入膀胱区、子宫肌层血管不均质和子宫肌层变薄。可选序列（如 DWI/ADC）可提供关于胎盘血管分布的更多细节。

粘连性胎盘谱系疾病患者子宫肌层中断和局灶性子宫膨出的典型表现。(A) 矢状位 T2 加权图像显示植入性胎盘患者前壁胎盘处局灶性子宫肌层中断（空卵圆形）。(B) 矢状位 T2 加权图像显示粘连性胎盘患者后壁胎盘处局灶性子宫肌层变薄（空卵圆形）。(C) 矢状位 T2 加权图像显示穿透性胎盘患者前壁胎盘处局灶性子宫膨出（虚线）。(D) 矢状位 T2 加权图像显示粘连性胎盘患者后壁胎盘处局灶性子宫膨出（虚线）

来源：Bachmann, C., Abele, H., & Hoopmann, M. (2023).Placenta Previa et Percreta: A Potentially Life-Threatening Condition.Diagnostics (Basel, Switzerland), 13(3), 539.https://doi.org/10.3390/diagnostics13030539



23-year-old woman (gravida −2) with history of previous Caesarean section. The sagittal T2 HASTE (a, b) and SSFP (c) MR images show placenta previa with dark bands (open arrows) and loss of uteroplacental interface (arrows). Since placenta accreta was present during elective Caesarean section, uterine artery embolisation was performed, and she was placed on follow-up

Reproduced from: Mahalingam, H. V., Rangasami, R., Premkumar, J., & Chandrasekar, A. (2021). Placenta accreta scoring system (PASS)—assessment of a simplified clinico-radiological scoring system for antenatal diagnosis of placenta accreta. Egyptian Journal of Radiology and Nuclear Medicine, 52(1), 1–6. https://doi.org/10.1186/S43055-021-00427-Y/TABLES/2

Imaging of the Female Pelvis

女性盆腔影像学

CHAPTER OUTLINE:

章节大纲：

23 岁女性（第二次怀孕），有既往剖宫产史。矢状位 T2 HASTE 序列（a、b）和 SSFP 序列 (c) MR 图像显示前置胎盘伴暗带（空心箭头）和子宫胎盘界面消失（箭头）。因择期剖宫产术中发现胎盘粘连，行子宫动脉栓塞术，并对患者进行随访

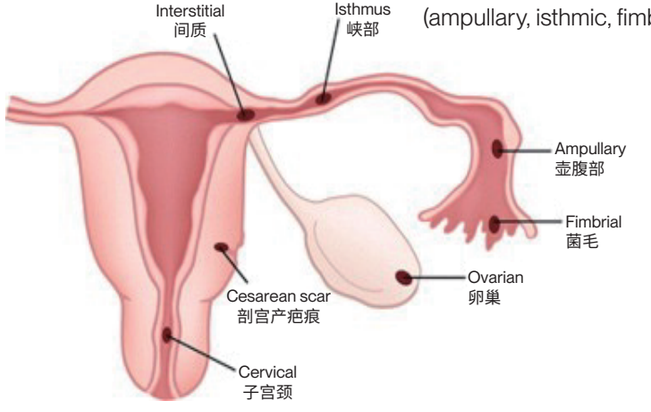
来源： Mahalingam, H. V., Rangasami, R., Premkumar, J., & Chandrasekar, A. (2021). Placenta accreta scoring system (PASS)—assessment of a simplified clinico-radiological scoring system for antenatal diagnosis of placenta accreta. Egyptian Journal of Radiology and Nuclear Medicine, 52(1), 1–6. https://doi.org/10.1186/S43055-021-00427-Y/TABLES/2

/ Ectopic Pregnancy

Ectopic pregnancy occurs when a fertilised egg implants outside the uterus, most commonly in the fallopian tube.

Types:

Tubal Pregnancy: The most common type, where the embryo implants in the fallopian tubes. It can further be classified based on the specific site within the tube (ampullary, isthmic, fimbrial).



Usual and unusual sites of ectopic pregnancy

Reproduced from : Badr, S., Ghareep, A.-N., Abdulla, L. M., & Hassanein, R. (2013). Ectopic pregnancy in uncommon implantation sites. The Egyptian Journal of Radiology and Nuclear Medicine, 44(1), 121–130. https://doi:10.1016/j.ejrnm.2012.10.006

Ovarian Pregnancy: The embryo implants on the surface of the ovary.

Cervical Pregnancy: Implantation occurs within the cervical canal, which is particularly dangerous due to the risk of heavy bleeding.

Interstitial Pregnancy: The embryo implants in the interstitial part of the tube, which is the portion that passes through the uterine musculature.

Abdominal Pregnancy: A rare form where the embryo implants in the abdominal cavity, outside the reproductive organs.

Caesarean Scar Pregnancy: Implantation occurs within the scar of a previous caesarean section.

CHAPTER OUTLINE:

/ 异位妊娠

异位妊娠是指受精卵在子宫外着床，最常见于输卵管。

类型：

输卵管异位妊娠：最常见的类型，胚胎在输卵管中着床。根据输卵管内具体着床部位可进一步分类（壶腹部、峡部、伞部）。

卵巢妊娠：胚胎在卵巢表面着床。

宫颈妊娠：着床发生在宫颈管内，因存在大出血风险而尤为危险。

输卵管间质部妊娠：胚胎植入输卵管间质部，即穿过子宫肌肉组织的部分。

腹腔妊娠：一种罕见类型，胚胎在腹腔内（生殖器官以外的部位）着床。

剖宫产瘢痕妊娠：着床发生在既往剖宫产手术的瘢痕部位。

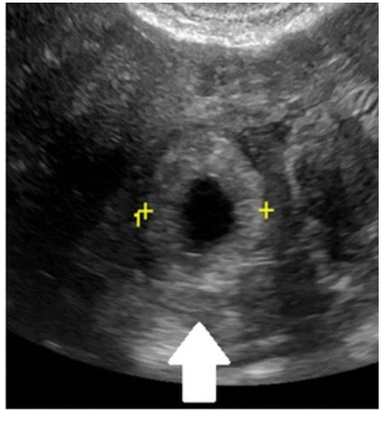
异位妊娠的常见及少见部位

来源：Badr, S., Ghareep, A.-N., Abdulla, L. M., & Hassanein, R. (2013). Ectopic pregnancy in uncommon implantation sites. The Egyptian Journal of Radiology and Nuclear Medicine, 44(1), 121–130. https://doi:10.1016/j.ejrnm.2012.10.006

/ Ectopic Pregnancy: Ultrasound

Ultrasound is the primary imaging modality for diagnosing ectopic pregnancy. US features of ectopic pregnancy include:

- / **Tubal Ring Sign:** A hyperechoic ring surrounding an extrauterine gestational sac, often seen in tubal pregnancies.
- / **Free Fluid:** Especially in the pouch of Douglas, suggesting potential rupture and hemoperitoneum.
- / **Adnexal Mass:** Presence of an adnexal mass separate from the ovary.
- / **Absence of Intrauterine Pregnancy:** Especially in the presence of a positive pregnancy test.



Tubal ectopic pregnancy by transvaginal ultrasound. The arrow indicates the ectopic gestation with a surrounding hyperechoic ring, called the 'bagel' or 'tubal' sign.

Reproduced from: Panelli, D. M., Phillips, C. H., & Brady, P. C. (2015). Incidence, diagnosis and management of tubal and nontubal ectopic pregnancies: a review. Fertility research and practice, 1, 15. https://doi.org/10.1186/s40738-015-0008-z

Unilateral twin ectopic pregnancy. Transvaginal ultrasound scan of the right adnexa, demonstrating two distinct gestational sacs, situated within the right fallopian tube.

Reproduced from: Martin, A., Balachandar, K., & Bland, P. (2021). Management of a spontaneously conceived live unilateral twin ectopic pregnancy in Australia: A case report. Case Reports in Women's Health, 30, e00300. https://doi.org/10.1016/J.CRWH.2021.E00300

/ 异位妊娠：超声

超声是诊断异位妊娠的主要影像学检查方法。异位妊娠的超声特征包括：

- / **输卵管环征：**宫外妊娠囊周围的高回声环，常见于输卵管妊娠。
- / **游离液体：**尤其是在道格拉斯窝，表明可能存在破裂和腹腔积血。
- / **附件肿块：**存在与卵巢分离的附件肿块。
- / **无宫内妊娠：**尤其是在妊娠试验呈阳性的情况下。

经阴道超声显示输卵管异位妊娠。箭头所指为异位妊娠，其周围有高回声环，称为“百吉饼”征或“输卵管”征。

来源：Panelli, D. M., Phillips, C. H., & Brady, P. C. (2015). Incidence, diagnosis and management of tubal and nontubal ectopic pregnancies: a review. Fertility research and practice, 1, 15. https://doi.org/10.1186/s40738-015-0008-z

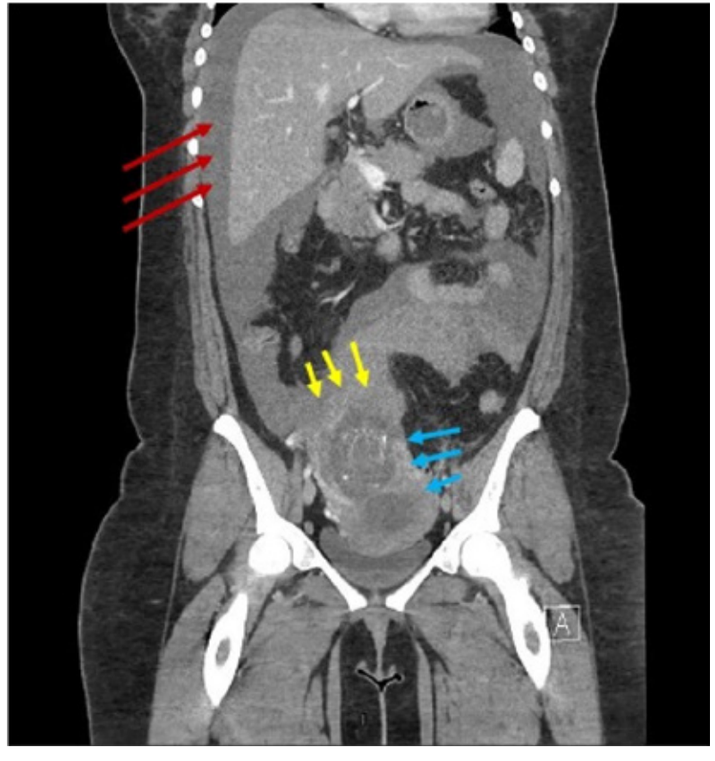
单侧输卵管双胎异位妊娠。经阴道超声扫描右侧附件区，显示右侧输卵管内可见两个独立的妊娠囊。

来源：Martin, A., Balachandar, K., & Bland, P. (2021). Management of a spontaneously conceived live unilateral twin ectopic pregnancy in Australia: A case report. Case Reports in Women's Health, 30, e00300. https://doi.org/10.1016/J.CRWH.2021.E00300

/ Ectopic Pregnancy: CT

CT is not routinely used for diagnosing ectopic pregnancy due to radiation exposure. However, it may be used in emergency settings to identify rupture and associated hemoperitoneum.

CT may reveal pelvic masses, free fluid, and blood in the abdomen, indicative of a ruptured ectopic pregnancy.



CT scan of the abdomen and pelvis in the coronal plane. The scan revealed large volume hemoperitoneum (red arrows), location of interstitial ectopic pregnancy (blue arrows), an empty uterine cavity (blue arrows), and the area of suspected rupture (yellow arrows).

Reproduced from: Ahlschlager, L. M., Mysona, D., & Beckham, A. J. (2021). The elusive diagnosis and emergent management of a late-presenting ruptured interstitial pregnancy: a case report. BMC Pregnancy and Childbirth, 21(1), 1–5. https://doi.org/10.1186/S12884-021-04026-7/FIGURES/5

CHAPTER OUTLINE:

章节大纲：

/ 异位妊娠：CT

由于存在辐射暴露，CT 并不常规用于诊断异位妊娠。但在紧急情况下，CT 可用于识别异位妊娠破裂及相关腹腔积血。

CT 可能显示盆腔肿块、游离液体和腹腔出血，提示异位妊娠破裂。

腹部及盆腔冠状位 CT 扫描。扫描显示大量腹腔积血（红色箭头）、输卵管间质部异位妊娠位置（蓝色箭头）、宫腔空虚（蓝色箭头）和疑似破裂区域（黄色箭头）。

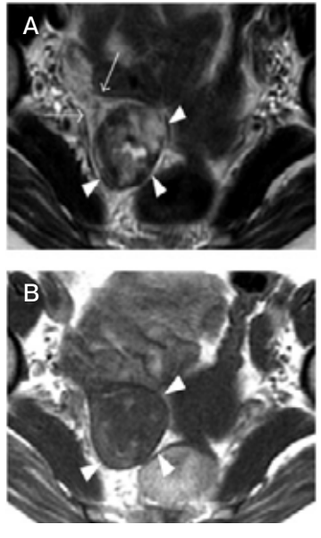
来源：Ahlschlager, L. M., Mysona, D., & Beckham, A. J. (2021). The elusive diagnosis and emergent management of a late-presenting ruptured interstitial pregnancy: a case report. BMC Pregnancy and Childbirth, 21(1), 1–5. https://doi.org/10.1186/S12884-021-04026-7/FIGURES/5

/ Ectopic Pregnancy: MRI

MRI is typically used when ultrasound findings are inconclusive, especially in complex cases.

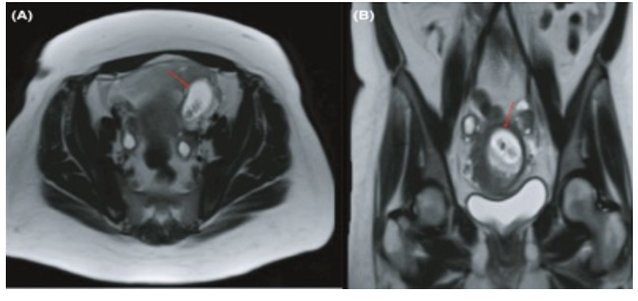
MRI can provide detailed information about the location and extent of the ectopic pregnancy.

Ectopic gestational sacs may appear as a mass in the adnexal region, with or without a yolk sac or embryo. MRI can also detect hemorrhage and distinguish ectopic pregnancy from other pelvic pathologies.



Ovarian pregnancy, rare form of ectopic pregnancy (A) Axial T2-weighted MR image shows a GS structure of heterogeneous high intensity (arrowhead), containing punctate foci of distinct low intensity. The GS is incarcerated to the right ovary, forming a "beak sign" (arrows). (B) Axial T1-weighted MR image showed GS structure (arrowhead) containing punctate foci of high intensity.

Reproduced from: Io, S., Hasegawa, M., & Koyama, T. (2015). A Case of Ovarian Pregnancy Diagnosed by MRI. Case Reports in Obstetrics and Gynecology, 2015, 1–3. https://doi.org/10.1155/2015/143031



T2-weighted axial and coronal images showing left tubal ectopic pregnancy seen as a sac-like lesion with thick wall measures 56 x 35 x 46 mm contains fetus with crown-rump length 27 mm and intrauterine pregnancy with same crown-rump length.

Reproduced from: Abdelmonem, A. H., Sayed, G., Abugazia, A. E., Kohla, S., & Youssef, R. (2021). Heterotopic pregnancy after a spontaneous conception a case report with a review of clinical, laboratory and imaging findings. Clinical Case Reports, 9(8), e04649. https://doi.org/10.1002/CCR3.4649

Imaging of the Female Pelvis

/ 女性盆腔影像学

/ 异位妊娠：MRI

CHAPTER OUTLINE:

当超声检查结果不明确时，尤其是在复杂病例中，通常会使用 MRI。

MRI 可提供关于异位妊娠位置及范围的详细信息。

异位妊娠囊可能表现为附件区肿块，伴或不伴卵黄囊或胚胎。
MRI 还可检测出血情况，并将异位妊娠与其他盆腔病变相鉴别。

卵巢妊娠，一种罕见的异位妊娠类型 (A) 轴位 T2 加权 MR 图像显示妊娠囊 (GS) 结构呈不均匀高信号（箭头），内见散在点状明显低信号灶。GS 被嵌顿于右侧卵巢，形成“喙征”（箭头）。(B) 轴位 T1 加权 MR 图像显示 GS 结构（箭头）内见点状高信号灶。

来源：Io, S., Hasegawa, M., & Koyama, T. (2015). A Case of Ovarian Pregnancy Diagnosed by MRI. Case Reports in Obstetrics and Gynecology, 2015, 1–3. https://doi.org/10.1155/2015/143031

T2 加权轴位及冠状位图像显示左侧输卵管异位妊娠，表现为囊样病变，壁厚，大小 56×35×46 mm，内见胎芽，头臀长 27 mm；同时可见宫内妊娠，胎芽头臀长相同。

来源：Abdelmonem, A. H., Sayed, G., Abugazia, A. E., Kohla, S., & Youssef, R. (2021). Heterotopic pregnancy after a spontaneous conception a case report with a review of clinical, laboratory and imaging findings. Clinical Case Reports, 9(8), e04649. https://doi.org/10.1002/CCR3.4649

/ Take-Home Messages

Ultrasound (US)

- / Primary tool for initial assessment, especially in pregnancy.
- / Effective in diagnosing ectopic pregnancies, placental disorders, and ovarian cysts.
- / Offers real-time imaging, crucial for emergency conditions like ovarian torsion.

MRI

- / Ideal for complex gynecological cancers (endometrial, ovarian, cervical) due to superior soft tissue contrast.
- / Essential in assessing placenta accreta spectrum disorders, following SAR/ESUR guidelines.
- / Useful in differentiating benign from malignant pelvic masses.

Computed Tomography (CT):

- / Employed for evaluating advanced stages of gynecological cancers and detecting metastasis.
- / Useful in emergency settings for conditions like ruptured ectopic pregnancy.
- / Limited use in pregnancy due to radiation exposure.

/ 女性盆腔影像学

/ 核心要点

CHAPTER OUTLINE:

章节大纲：

超声 (US)

- / 初步评估的主要工具，尤其是在妊娠期。
- / 可有效诊断异位妊娠、胎盘异常和卵巢囊肿。
- / 提供实时成像，对卵巢扭转等紧急情况至关重要。

MRI

- / 由于出色的软组织对比度，是复杂妇科癌症（子宫内膜癌、卵巢癌、宫颈癌）的理想选择。
- / 根据 SAR/ESUR 指南，在评估粘连性胎盘谱系疾病中至关重要。
- / 有助于区分良性和恶性盆腔肿块。

计算机断层扫描 (CT):

- / 用于评估妇科恶性肿瘤的进展期并检测转移灶。
- / 在异位妊娠破裂等紧急情况下有应用价值。
- / 因存在辐射暴露，在孕期的应用受限。

In this presentation on female pelvic imaging, we've highlighted the importance of using the appropriate imaging modality based on the patient's clinical scenario.

Key points include:

- **Common Conditions:** Master the imaging characteristics of endometrial, ovarian, and cervical cancers, and ectopic pregnancy. Customise imaging strategies for each clinical situation to ensure precise diagnosis and effective treatment.
- **Routine Pregnancy Screening:** Essential for women of childbearing age before any radiologic procedure involving ionising radiation.
- **Risk-Benefit Analysis:** Assess the necessity of the imaging procedure, weighing potential risks to the fetus.
- **Ultrasound and MRI Preference:** Recommended due to their safety in pregnancy.
- **Limited Use of CT Scans:** Utilised only when necessary, with dose optimisation.
- **Radiation Dose Management:** Aim to limit the radiation dose as much as possible.
- **Patient Education:** Important to inform patients about the risks and benefits of radiologic procedures during pregnancy.
- **Collaborative Decision-Making:** Multidisciplinary approach for optimal patient care. Thorough Documentation: Documenting the rationale for the imaging modality choice is crucial.

<!> ATTENTION

For detailed guidelines and best practices, refer to the ACR-SPR practice parameters.

Imaging of the Female Pelvis

CHAPTER OUTLINE:

女性盆腔影像学

章节大纲：

在本次关于女性盆腔影像的介绍中，我们着重强调了根据患者临床情况选择合适影像检查方式的重要性。

要点包括：

- **常见疾病：**掌握子宫内膜癌、卵巢癌、宫颈癌及异位妊娠的影像学特征。针对每种临床情况定制成像策略，以确保精准诊断和有效治疗。
- **常规妊娠筛查：**对于育龄女性，在进行任何涉及电离辐射的放射检查前，妊娠筛查必不可少。
- **风险-受益分析：**评估成像检查的必要性，权衡对胎儿的潜在风险。
- **超声和 MRI 优先：**由于其对于妊娠女性的安全性，因此推荐使用。
- **CT 扫描限制使用：**仅在必要时使用，同时优化辐射剂量。
- **辐射剂量管理：**尽可能限制到最小辐射剂量。
- **患者教育：**务必告知患者妊娠期进行影像学检查的利弊。
- **协作决策：**采用多学科协作模式以实现最佳患者关爱。全面记录：记录成像方式选择的依据至关重要。

<!> 注意

有关详细指南和最佳实践，请参阅 ACR-SPR 实践参数。

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/ Imaging of the Female Pelvis

/ 女性盆腔影像学

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Imaging of the Female Pelvis

女性盆腔影像学

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Imaging of the Female Pelvis

女性盆腔影像学

CHAPTER OUTLINE:

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Test Your Knowledge

Imaging of the Female Pelvis

女性盆腔影像学

CHAPTER OUTLINE:

章节大纲：

知识测试

Test Your Knowledge

<?> QUESTION

1 What is the primary imaging modality for diagnosing ectopic pregnancy?

- ☐ MRI
- ☐ CT Scan
- ☐ Ultrasound
- ☐ X-ray

知识测试

CHAPTER OUTLINE:

章节大纲：

<?> 问题

1 诊断异位妊娠的主要影像学检查方法是什么？

- ☐ MRI
- ☐ CT 扫描
- ☐ 超声
- ☐ X 线

/ Test Your Knowledge

<?> ANSWER

1 What is the primary imaging modality for diagnosing ectopic pregnancy?

- ☐ MRI
- ☐ CT Scan
- ■ Ultrasound
- ☐ X-ray

/ 知识测试

<?> 回答

1 诊断异位妊娠的主要影像学检查方法是什么?

- ☐ MRI
- ☐ CT 扫描
- ■ 超声
- ☐ X 线

CHAPTER OUTLINE:

章节大纲:

Test Your Knowledge

<?> QUESTION

2 What is the primary role of CT in the evaluation of cervical cancer?

- ☐ Evaluating the primary tumour
- ☐ Detecting lymphadenopathy and defining the extent of advanced disease
- ☐ Diagnosing early-stage disease
- ☐ Guiding surgical procedures

知识测试

CHAPTER OUTLINE:

章节大纲：

<?> 问题

2 CT 在宫颈癌评价中的主要作用是什么？

- ☐ 原发性肿瘤评估
- ☐ 检测淋巴结病变并明确晚期病变范围
- ☐ 早期疾病诊断
- ☐ 指导外科手术操作

/ Test Your Knowledge

<?> ANSWER

2 What is the primary role of CT in the evaluation of cervical cancer?

- ☐ Evaluating the primary tumour
- ■ Detecting lymphadenopathy and defining the extent of advanced disease
- ☐ Diagnosing early-stage disease
- ☐ Guiding surgical procedures

CHAPTER OUTLINE:

<?> 回答

2 CT 在宫颈癌评价中的主要作用是什么?

- ☐ 原发性肿瘤评估
- ■ 检测淋巴结病变并明确晚期病变范围
- ☐ 早期疾病诊断
- ☐ 指导外科手术操作

Test Your Knowledge

<?> QUESTION

3 Which imaging modality is recommended for its safety in pregnancy?

- ☐ Ultrasound
- ☐ CT and X-ray
- ☐ PET Scan
- ☐ Nuclear Medicine Scans Evaluating the primary tumour

CHAPTER OUTLINE:

<?> 问题

3 考虑到妊娠期间的安全性，建议进行哪种影像学检查?

- ☐ 超声
- ☐ CT 和 X 线检查
- ☐ PET 扫描
- ☐ 评价原发性肿瘤的核医学扫描

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<?> QUESTION

4 For what purpose is CT used in emergency settings related to pregnancy?

- ☐ Routine check-ups
- ☐ Evaluating placental position
- ☐ Identifying rupture and associated hemoperitoneum in ectopic pregnancy
- ☐ Assessing fetal development

CHAPTER OUTLINE:

<?> 问题

4 在与妊娠相关的紧急情况下，使用 CT 的目的是什么？

- ☐ 常规检查
- ☐ 评估胎盘位置
- ☐ 识别异位妊娠破裂及相关腹腔积血
- ☐ 胎儿发育评估

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CHAPTER OUTLINE:

Test Your Knowledge

<?> QUESTION

5 What key feature is assessed by ultrasound in cases of placental abnormalities?

- ☐ Fetal heart rate
- ☐ Amniotic fluid level
- ☐ Placenta previa and placental lacunae
- ☐ Gender of the fetus

CHAPTER OUTLINE:

知识测试

<?> 问题

5 在胎盘异常的病例中，超声评估的关键特征是什么？

- ☐ 胎心率
- ☐ 羊水量
- ☐ 前置胎盘和胎盘血窦
- ☐ 胎儿性别

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<?> QUESTION

6 How is MRI used in the evaluation of ectopic pregnancies?

- ☐ As the first-line imaging technique
- ☐ When ultrasound findings are inconclusive, especially in complex cases
- ☐ To confirm intrauterine pregnancy
- ☐ It is not used in ectopic pregnancy evaluation

CHAPTER OUTLINE:

<?> 问题

6 MRI 在评估异位妊娠中如何应用?

- ☐ 作为一线影像技术
- ☐ 超声检查结果不明确时，尤其是在复杂病例中
- ☐ 确认宫内妊娠
- ☐ 不用于异位妊娠评估

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Test Your Knowledge

<?> QUESTION

7 In the context of ectopic pregnancy, what does the 'Tubal Ring Sign' indicate on an ultrasound?

- ☐ Intrauterine pregnancy
- ☐ Ovarian cyst
- ☐ Extrauterine gestational sac, often seen in tubal pregnancies
- ☐ Uterine fibroids

CHAPTER OUTLINE:

章节大纲：

<?> 问题

7 在异位妊娠的情况下，超声检查中的“输卵管环征”表示什么？

- ☐ 宫内妊娠
- ☐ 卵巢囊肿
- ☐ 宫外孕囊，常见于输卵管妊娠
- ☐ 子宫肌瘤

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/ Test Your Knowledge

<?> QUESTION

8

What is a common appearance of ovarian cancer on ultrasound imaging

- ☐ A hypoechoic solid mass with well-defined edges
- ☐ A complex mass with both cystic and solid components
- ☐ A homogeneous cystic mass
- ☐ A hyperechoic solid mass with irregular contours

/ 知识测试

<?> 问题

8

卵巢癌在超声成像上的常见表现是什么？

- ☐ 边界清晰的低回声实性肿块
- ☐ 包含囊性和实性成分的混合性肿块
- ☐ 均匀的囊性肿块
- ☐ 轮廓不规则的高回声实性肿块

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- ☐ 轮廓不规则的高回声实性肿块

Test Your Knowledge

<?> QUESTION

9 What imaging modality is most effective for staging ovarian cancer?

- ☐ Ultrasound
- ☐ CT Scan
- ☐ MRI
- ☐ PET Scan

知识测试

<?> 问题

9 对于卵巢癌分期，最有效的影像学方法是什么？

- ☐ 超声
- ☐ CT 扫描
- ☐ MRI
- ☐ PET 扫描

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- ☐ PET 扫描

/ Test Your Knowledge

<?> QUESTION

10 What characteristic is indicative of a dermoid cyst in an ovarian ultrasound?

- ☐ Hyperechoic solid mass with regular margins
- ☐ Hypoechoic fluid-filled structure
- ☐ Mixed echogenicity with calcifications and possibly fat components
- ☐ Completely anechoic structure with a thin wall

CHAPTER OUTLINE:

<?> 问题

10 在卵巢超声检查中，皮样囊肿的特征性表现是什么？

- ☐ 边缘规则的高回声实性肿块
- ☐ 低回声液性结构
- ☐ 混合回声，伴钙化，可能含脂肪成分
- ☐ 薄壁的完全无回声结构

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