NAVIGATING THE CANAL: COMMON INGUINAL PATHOLOGY AND THEIR MIMICS

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Objectives

- Review common and uncommon inguinal pathology
- Differentiate inguinal canal pathology mimics
- Multimodality case examples with differential diagnosis

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Hernias

- **Examples**
  - Direct or indirect
  - Fat or bowel containing
  - Complicated (incarcerated, Amyand, etc.)

- **Etiology:**
  - Persistent patency of the inguinal canal

- **DDx:**
  - Hydrocele
  - Lipomatous lesions (liposarcoma, lipomatosis of the spermatic cord)

**BILATERAL INGUINAL HERNIAS WITH BOWEL OBSTRUCTION**

Axial and coronal CECT images demonstrate large bilateral hernias (open arrows) containing cecum, ileum and ascites on the right with upstream small bowel dilation and fecalization (filled arrow), bowel wall thickening, stranding, and fluid, compatible with bowel obstruction.

Coronal 3D VR images of the pelvis demonstrates course of colon (yellow) extending into and out of the left inguinal hernia (dashed earrows).

**BLADDER HERNIATION WITH CYSTITIS**

Axial and coronal CECT images demonstrate right inguinal hernia with herniation of a portion of the urinary bladder (arrow) with associated bladder wall thickening and mild fat stranding.

**MIMIC: LIPOSARCOMA**

Axial and coronal CECT images demonstrate a large complex fatty mass (open arrow) with areas of soft tissue within the left inguinal canal, displacing the left testicle (filled arrow). Lesion was resected and pathology proven poorly differentiated liposarcoma.

Abbreviations: US = ultrasound, CECT = contrast enhanced CT, 3D VR = three dimensional volume rendered
Hydroceles

- **Examples:**
  - Simple
  - Encysted
  - Congenital/ acquired

- **Etiology:**
  - Patency of processus vaginalis with fluid

- **DDx:**
  - Hernia
  - Pseudo-aneurysm
  - Varicocele
  - Lymphocele
  - Soft tissue infection

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**REMNANT OF PATENT PROCESSUS VAGINALIS**

Grayscale US image of the right inguinal canal demonstrates a cystic structure extending from the deep inguinal ring (open arrow) into the scrotal sac (arrow).

Axial and coronal CECT images demonstrate a thin-walled cystic structure within the right pelvis (open arrow) extending into the right inguinal canal (arrow) which is separate from adjacent bowel loops, the appendix and the urinary bladder.

Coronal 3D VR image of the pelvis on the same patient demonstrates extent of patent processus vaginalis (blue) extending into the inguinal canal

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**INFLAMED ENCYSTED HYDROCELE WITHIN PATENT CANAL OF NUCK**

Doppler and grayscale US images demonstrate a septated cystic structure within the inguinal canal (open arrow) with increased Doppler flow.

Coronal CECT image demonstrates a fluid-filled tubular structure with wall thickening within the right inguinal canal (closed arrow).

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**MIMIC: SPERMATIC CORD VARICOCELE**

Axial and coronal CECT images demonstrate tubular enhancing structure within the right inguinal region, which demonstrates continuity with retroperitoneal venous structures, compatible with spermatic cord varicocele.

Abbreviations: US = ultrasound, CECT = contrast enhanced CT, 3D VR = three dimension volume rendered
Masses

- **Examples:**
  - Ectopic gonad
  - Spermatic cord lipoma

- **Etiology:**
  - Abnormal migration or ectopic location
  - Congenital or acquired

- **DDx:**
  - Sarcoma
  - Endometrioma
  - Metastatic implant
  - Hematoma

**OVARIAN TORSION WITHIN A PATENT CANAL OF NUCK**

Grayscale and spectral Doppler US images of the demonstrate a solid mass in the left inguinal canal (open arrow) with small peripheral follicles, and a high resistance arterial waveform (dashed arrow), No venous flow identified.

Axial, sagittal and coronal CECT images demonstrate a cystic structure within the left inguinal canal with herniation of left ovary (open arrow) which appears enlarged, heterogeneous and hypoenhancing concerning for ovarian torsion within the canal of Nuck.

Coronal 3D VR images demonstrates cystic and solid mass within left inguinal canal (open arrow) and skin rendering of the mass

**CRYPTORCHIDISM**

Coronal and axial CECT images demonstrate a 3 cm well-circumscribed ovoid solid lesion (open arrow) along the left distal external iliac vessels with the left gonadal vessels coursing to it. The left testicle is not visualized within the scrotal sac (not visualized).

**MIMIC: C-SECTION SCAR ENDOMETRIOMA**

Axial and coronal CECT images demonstrate an irregular lobulated mass (open arrow) along the left lateral aspect of Pfannenstiel C-section scar (filled arrow). Patient had a history of endometriosis with enlarging mass above inguinal canal (dashed arrow).

Abbreviations: US = ultrasound, CECT = contrast enhanced CT, 3D VR = three dimensional volume rendered
Coronal 3D VR images demonstrate a dilated venous structure abutting the left inguinal region compatible with a femoral varicocele (open arrow) and a lobular cystic structure within the left inguinal canal (dashed arrow) compatible with a hydrocele.

Other mimics

- **Examples:**
  - Soft tissue infection
  - Musculoskeletal
  - Vascular
  - Metastatic

- **Etiology:**
  - Infection
  - Inflammation
  - Iatrogenic
  - Metastatic

- **DDx:**
  - Varies

**MIMIC: COMPLICATED SOFT TISSUE COLLECTION**

Grayscale US image of the upper medial left thigh demonstrates large heterogeneous mixed echogenicity intramuscular soft tissue collection (open arrow). Coronal CECT image demonstrates arge intramuscular multiloculated low-density collection in the medial compartment of the left thigh extending to the pubic symphysis.

**MIMIC: VARICOELE AND HYDROCELE**

Coronal 3D VR images demonstrate a dilated venous structure abutting the left inguinal region compatible with a femoral varicocele (open arrow) and a lobular cystic structure within the left inguinal canal (dashed arrow) compatible with a hydrocele.

**MIMIC: HIP OSTEOCHONDROMATOSIS**

Axial and coronal T1FS postcontrast MR images of the right hip demonstrate markedly thickened and hyperenhancing synovium (open arrow) with associated bone marrow edema (dashed arrow). Plain radiograph demonstrates several ossified interarticular bodies (closed arrow).

Abbreviations: US = ultrasound, CECT = contrast enhanced CT, 3D VR = three dimensional volume rendered.