Adnexal Masses and Problem Solving Pelvic MRI

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Objectives

• Characterisation of adnexal masses with MRI
  – When
  – Why
  – How
Adnexal masses

- Increased use of imaging to assess patients electively and emergently
- CT as the primary investigation
  - KUB, CTU, CTC
- Increased detection of adnexal masses
Adnexal masses

• Multidisciplinary meetings frequently ask
• Where is it?
• What is it?
• Does it need to come out?
• If so – how?
Differential diagnosis of adnexal masses
2 clinical scenarios

• Adnexal mass in the symptomatic patient
  • Will be resected
  • Question is how – big or small operation?

• Incidental finding of an adnexal mass
  • Aim of further imaging is to characterise benign lesions which can be managed conservatively
US and MR for adnexal masses

- Determine which patients may benefit from MRI
- Clinical and biochemical features crucial

- *Sohaib et al, Clin Rad 2005*
• False positive diagnoses of malignancy by US

• Complex cystic lesions endometriotic or haemorrhagic cysts and dermoids

• Solid masses - leiomyomata and fibromata
• MRI correct diagnosis of benign lesion
• Haemorrhage, clot, fat and non-perfused debris can be readily identified on MRI
• MRI performed better than US in cases where CA 125 was normal or only slightly elevated
Ultrasound

- Looks benign
  - Premenopausal, normal tumour markers, low clinical index of suspicion
    - MRI has little to add

- Suspicious US
  - Premenopausal, normal markers intermediate or low clinical suspicion
    - MRI for characterisation

- Looks malignant
  - High clinical suspicion for malignancy
    - Elevated CA 125
    - CT for staging
Ultrasound

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Can also apply this to CT findings
Problem solving MRI

- T1W
- T2W
- Fat Saturation
- Contrast Enhancement
- Diffusion Weighted Imaging

- Simple fluid
- Fat
- Blood
- Non-perfused debris
- Perfused solid material
Mature Fat

Dermoid

T2W  T1W  T1W+Fat Sat
Big lesions – may be difficult to fully assess with Ultrasound
Dermoids – be careful

- Malignant change
- Squamous carcinoma
- Skin elements, wall of the lesion
- Poor prognosis
2 years later
Blood

Variable appearance depending on age

T2W  T1W  T1W + Fat Sat
Blood of differing ages
Shading of contents on T2W MRI

Characteristic of endometrioma
Haemorrhagic Endometriosis

Shading of contents on T2W = Endometrioma

Haemorrhagic lesion with incomplete septations – plical folds = Haematosalpinx
Fibrotic Endometriosis

Tethering of adjacent structures
Endometriosis – be careful

Solid looking mass on CT
MRI – shading on T2W, blood on T1W, solid enhancing focus, cystic adenomyosis

Endometrioid carcinoma arising in an endometrioma
Solid elements?

• Give contrast
• Non-enhancing solid foci
  – Benign fibrous lesion
• Solid enhancing focus
  – Likely malignant
Solid elements?

- Give contrast
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T2W

T1W + Gad
Patterns of solid enhancement

- Serous borderline ovarian tumours
- Cystic and surface papillary types
- Younger age group
- Better prognosis
- Fertility sparing surgery
- Important diagnosis
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Solid Adnexal Masses

- Is it uterine or adnexal?

- What is the signal intensity on T2W?

- Does it enhance?
Three key signs

- Acute angle
- Obtuse angle
- Claw

Courtesy of Dr John Spencer
Solid Adnexal Masses

• Is it uterine or adnexal?

• What is the T2 SI?

• Does it enhance?
Solid Adnexal Masses

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Solid Adnexal Masses

- Low T2 signal and lack of enhancement suggest fibroid lineage
- Adenofibroma can look heterogeneous on T2 and show variable enhancement
- Low \( b = 800 \) value on DWI gives confidence to call a lesion benign
- Associated with free fluid in Meigs’ Syndrome

\[ \begin{array}{cc}
\text{T2W} & \text{b = 800} \\
\text{T1W} & \text{T1 + Gad}
\end{array} \]
Solid Adnexal Masses – be careful

- Change in bowel habit
- Palpable mass
- CT – bilateral solid adnexal masses
Solid Adnexal Masses – be careful

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- Sigmoid Carcinoma
- Ovarian metastases
Ovarian metastases

- ‘Krukenberg’ tumours
- Original description of bilateral solid masses
- Not always the case
- Variable appearance
- Indistinguishable from primary ovarian tumour
- Important differential diagnosis
Adnexal Masses in the Acute Setting

• Symptomatic adnexal masses will be resected

• How?
  – Cancer surgery
  – Simple excision of the mass

• Role of further imaging
  • Try to characterise the mass
  • Allow decision making about patient management
Acute pain, known adnexal lesion
Acute pain, known adnexal lesion

T2W  
T1W  
T1W+ Fat Sat  
Torsion
Intermittent pain, pelvic mass
Torsion of adnexal masses

• In adults there is usually an underlying benign lesion
  – Commonly dermoid
• Symptoms can be intermittent and non-specific
• Intramural haemorrhage is a recognised finding on MRI
Abdominal pain, fever
Abdominal pain, fever
Actinomycosis

- Associated with longstanding IUD
- Spreads by contiguity
- Crosses tissue planes
- Mimics malignancy
Actinomycosis

• 6 months later

• Important diagnosis

• Conservative management

• Removal of IUD

• Antibiotic therapy
Adnexal Masses and Problem Solving MRI

- MRI – excellent problem solving tool particularly where the prior probability of malignancy is low

- Be careful to look for neoplastic change
Adnexal Masses and Problem Solving MRI

• Metastatic disease to the ovaries is not always solid

• Pain may reflect a complication of benign pathology or an inflammatory process
Thank you
Solid Adnexal Masses

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