Sonography of the Appendix

- Clinical
- Key Anatomy
- Sonographic Features
  - Normal
  - How to visualise
- Abnormal
  - Typical
  - Atypical
  - Mimics

Overview

Workshop: Take Home Messages

- Clinical
  - Often Unhelpful
- Visualisation: Important
- Normal/Abnormal
- Non-visualisation
  - Doesn’t mean normal
- "Equivocal Appendix"
  - Real

Royal Women’s & Children’s: 91.7% visualisation (n= 1799)

· Royal Women’s & Children’s: 91.7% visualisation (n= 1799)
Simple question: How good are you?

- Technique
- Mindset
- Monash Story

Appendix: Key Anatomy

- Vermiform appendix
  - Latin
    - “dangling” “vermis” “form”
    - “dangling worm-shaped thing”
  - 2cm below ileocecal junction
  - Attached postero-medially
  - Note
    - Descending Colon
    - Terminal ileum / ileocecal junction
    - Cecum
    - Vermiform Appendix

Appendix: Surface Anatomy

- Located
  - McBurney’s Point: Is the point that is 1/3 along the line drawn from the ASIS to Umbilicus.

Appendix: Sonographic Anatomy

- Gut signature
  - 2-6mm
  - Contains gas
  - No mild vascularity
  - Compressible

- Surrounded by
  - Normal bowel
  - Inceohic fat
Highly Variable Anatomy

• Highly variable

Position
- Note: Retrocecal

Appendix: Vermiform Appendix:

Settings
- Decrease frame rate
- Decrease DR

Transducers
- Micro-convex
- Linear

How to visualise?

• Numerous strategies

Identify
- Caecum
- Ileocaecal junction
- “Most likely region”

Alternately
- “One finger test”

Key Anatomy

1. Descending Colon
2. Terminal ileum/ ileocecal junction
3. Cecum
4. Appendix

Descending Colon
Identify Caecum

Larger—Haustra
Undulating bumps
Expanded, Gas filled

http://brownemblog.com/blog/1/2017/3/pocus-for-appendicitis

Terminal Ileum
Identify Caecum

Small bowel no undulations—so no Haustra.
Medial/superior to cecum.

http://www.ultrasoundcases.info/files/Jpg/lbox_26493.jpg
**Appendix: Identify Caecum**

- Caecum
- Small Bowel
- Larger
  - Tenia Coli – Haustra
  - Expanded: Gas filled
- Smaller mucosal folds

**Appendix: The Scanning**

- Rapid scanning
- Strobe the layers
- Look for the blind ending "worm"

**Appendix: How to visualise?**

- Retroccecal
  - What can we do?

- Medial
  - What can we do?

- Sustained compression
  - Caecal
  - Fan: Superior, Inferior
  - Image: Postero-lateral
  - Lat Decubitus
  - Fan: Lat Medial
  - Time

- Fan med to lat
- Pressure
  - Off & On

- Use psoas / iliac vessels
- Time
Appendix: How to visualise?

- Medial
- What can we do?
  - Fan med to lat
  - Pressure
    - Off & On
  - Use psoas / iliac vessels

Appendix: How to visualise?

- Pelvic
- What can we do?
  - Graded Compression
  - Angle - use bladder
  - Endovaginal - Non-paediatric
  - Time

Appendix: How to visualise?

- Royal Women's & Children's: 91.7% visualisation (n=3799)

Appendix: The "Typical" Abnormal


Appendix: The "Typical" Abnormal
Appendix: What are the features?

14yo Male: “Marked Focal Pain”

Case Review

7yo male RIF pain

Appendix: The Very Abnormal - Harder

- Variable appearance
  - Hypo fluid collection/mass
  - Hyperaemic echogenic mass
  - Extruded appendicolith

Appendix: The Abnormal - Harder

- More advanced: More difficult
  - More advanced: More difficult
  - More advanced: More difficult
  - More advanced: More difficult

Appendix: The Abnormal - Harder

- Perforated
- Wound / History

Appendix: The Abnormal - Harder

- Appendiceal fluid collection
- Mass
- Hypo fluid collection/mass
- Hyperaemic echogenic mass
- Extruded appendicolith

Normal/ Abnormal?
Appendix: The “Equivocal”

- Case
- Point tenderness (Yes/No?)

- Sonographer – Yes
- Radiologist – No
- Surgeon – Yes
- Treated with Abx

Appendix: The “Equivocal”

- 28 yo female
- RIF pain, dyspareunia, dysuria
- Hx appendectomy
- IPD

Ultrasound

- ?

Atypical appearance: Case Review

- 22 yo
- Clinical
  - RUQ pain, nausea & vomiting
  - Cholecystitis
- Abdo ultrasound
  - normal GB
  - focally tender point
- 2% Appendicitis RUQ (fred 2012)

Atypical appearance: Stump Appendicitis

- 1:50000
- Pain, nausea, vomiting

Ultrasound appearance
  - Thickened stump, inflammation
  - Faecoliths, FF, inflamed cecum

Treatment
  - Complicated appendicitis
  - Laparoscopic approach

Atypical location: Case Review

- 70 yo
- Indirect Hernia - Contains normal appendix
  - Appendicitis: Amyands Hernia
Atypical appearance: Case Review

- Appendiceal / Appendix mucocele
  - Mucous
    - Abnormal accumulation
    - Dilatation
    - Viscous
  - Need to exclude malignancy
    - Mucinous cystadenoma
    - Pseudomyxoma peritonei

Atypical presentation: Chronic appendicitis

- Pathophysiology
  - Partial/recurrent obstruction
- Clinical symptoms
  - May be similar to acute
  - Normal WCC, no fever
- Criteria
  - Symptoms >2/52
  - Confirmed on histology (inflammatory infiltrate, wall fibrosis)
  - Relief post appendectomy

And the rare, ....

- Appendix invaginated into Caecum
  - Rare – 0.01% intussusceptions

Other differentials - Long List

- Intussusception

Other differentials

- Epiploic Appendicitis
  - Little pouches of peritoneum filled with fat. Can become twisted and twisted.
Other differentials

- Small / Large Rectus abdominis tear

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IMAGES

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