Pediatric Omental Infarction

Emma Holmes

06/24/2021

Diagnostic Radiology (RAD 4001)

Dr. Jonathan Hester

UTHealth®
The University of Texas
Health Science Center at Houston
McGovern
Medical School

Clinical History

8 y.o. female with no PMHx who presented 06/01/2021 with RUQ pain and anorexia

Hx

- Constant dull throbbing/pulling RUQ pain for 1 day
- Non radiating, no aggravating/alleviating factors
- Had fall 3 days ago
- No fever, chills, nausea, vomiting, diarrhea, constipation

Px

- VITALS:
  - BP - 127/77
  - P - 107
  - RR - 18
  - T - 100.2°F
  - SpO2 - 98%
- RUQ abdominal tenderness with +murphy's sign

DDX of pediatric abdominal pain

Children

- Gastroenteritis
- Appendicitis
- Constipation
- Functional pain
- Diabetic ketoacidosis
- UTI
- Trauma
- Pharyngitis
- Pneumonia
- Henoch-Scholein purpura
- Mesenteric lymphadenitis

Adolescents

- Appendicitis
- Gastroenteritis
- Constipation
- Dysmenorrhea
- Pelvic inflammatory disease
- Ectopic pregnancy
- Ovarian/testicular torsion
- Cholecystitis
- Inflammatory bowel disease
- Pancreatitis

Labs/imaging

- CBC w/ diff, BMP, Lipase, Liver profile

WBC	9.9 (78.7% neut)
Creatinine	0.5
Glucose	117
Alk Phos	232
Lipase	8

Abdominal U/S

IMPRESSION:

1. No evidence of cholelithiasis or acute cholecystitis.

2. Appendix not identified. No fluid collections in the right lower quadrant.

Normal anatomy

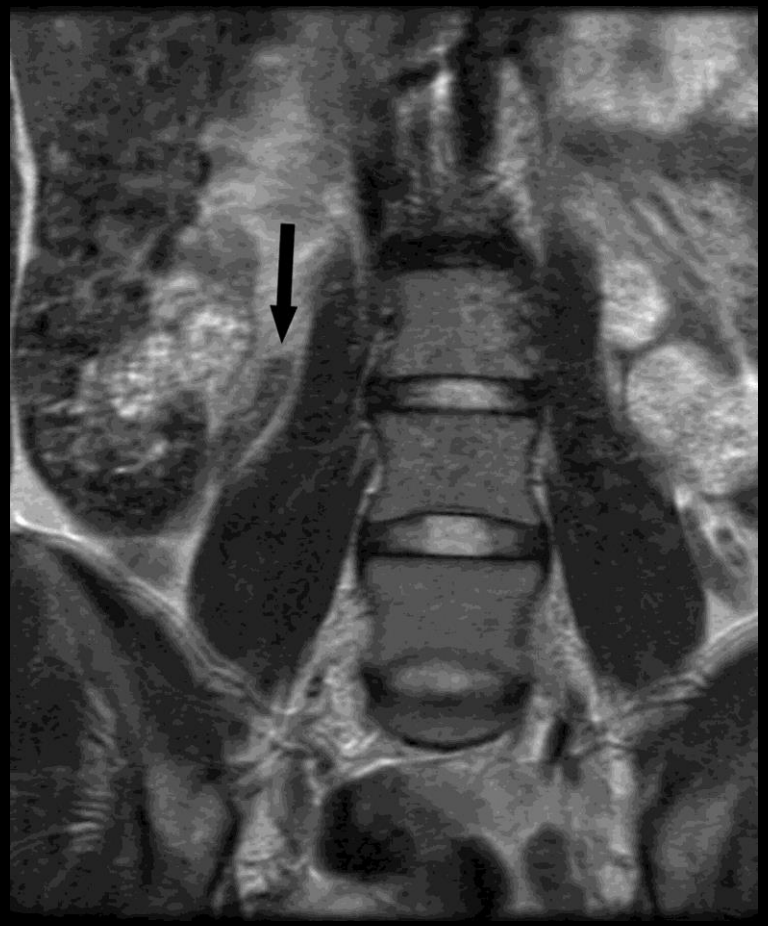


Figure 1

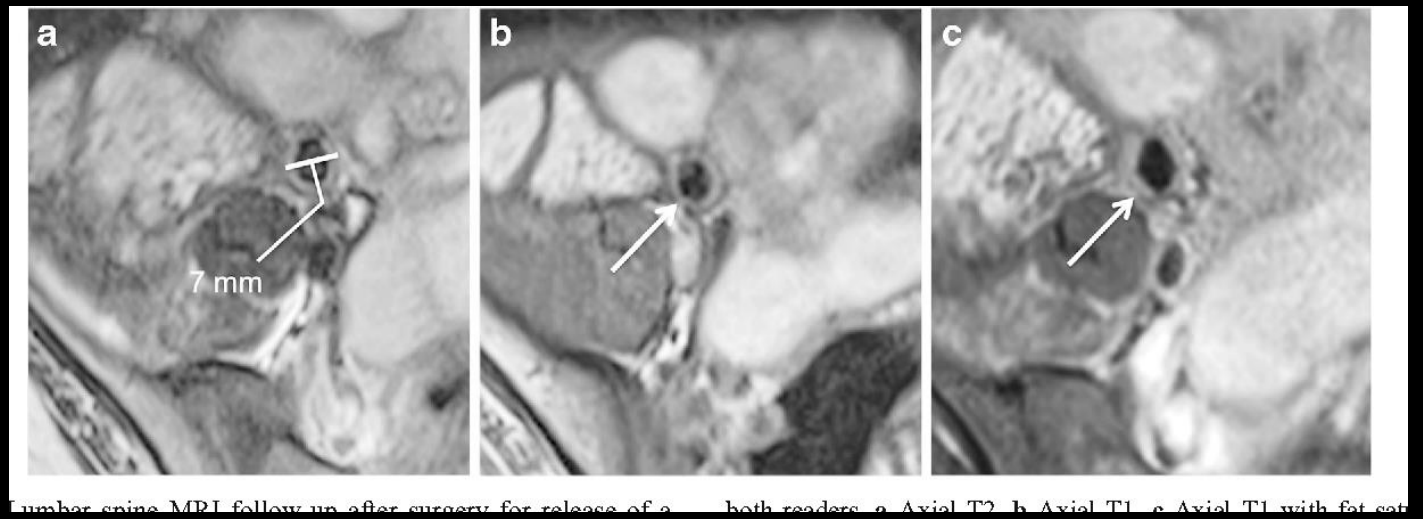


Figure 2

Figure 1:
- Normal appendix on MRI in adult patient.
- Measures 6mm

Figure 2:
- Normal appendix in child on post-operative scan
- Measures 7mm

Acute appendicitis MRI

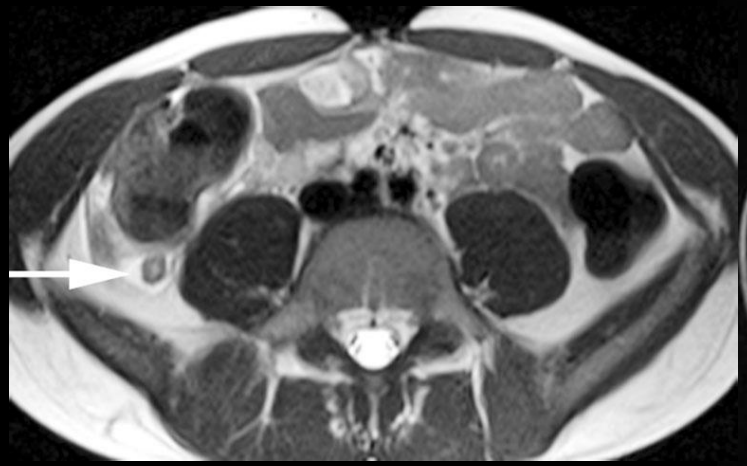


Figure 3

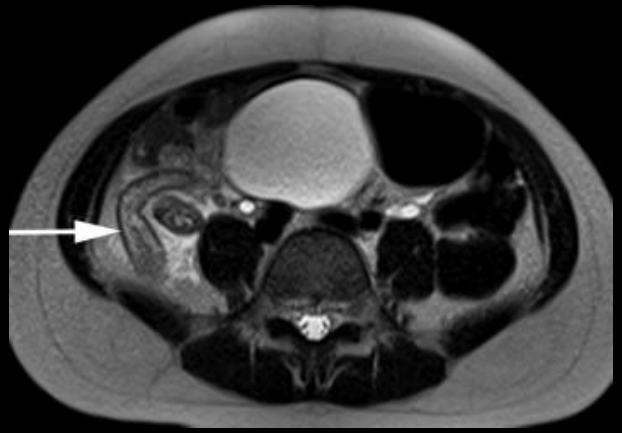


Figure 4

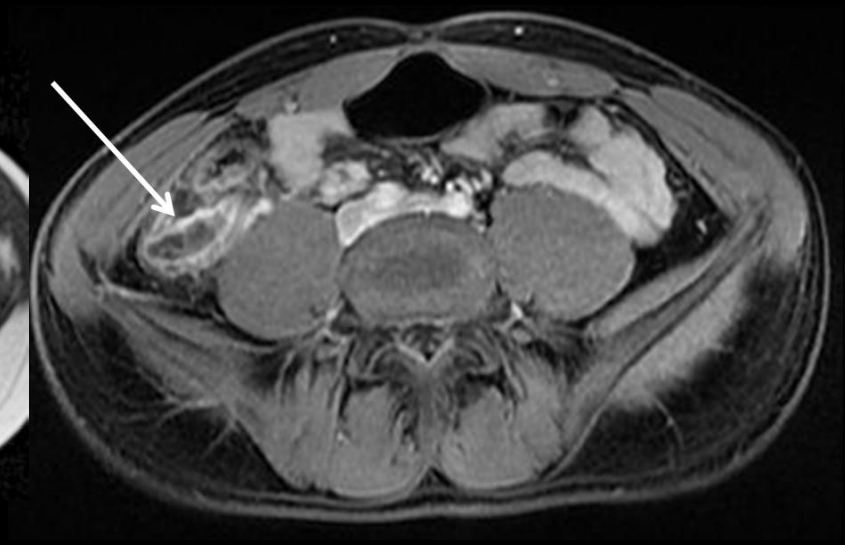


Figure 5a

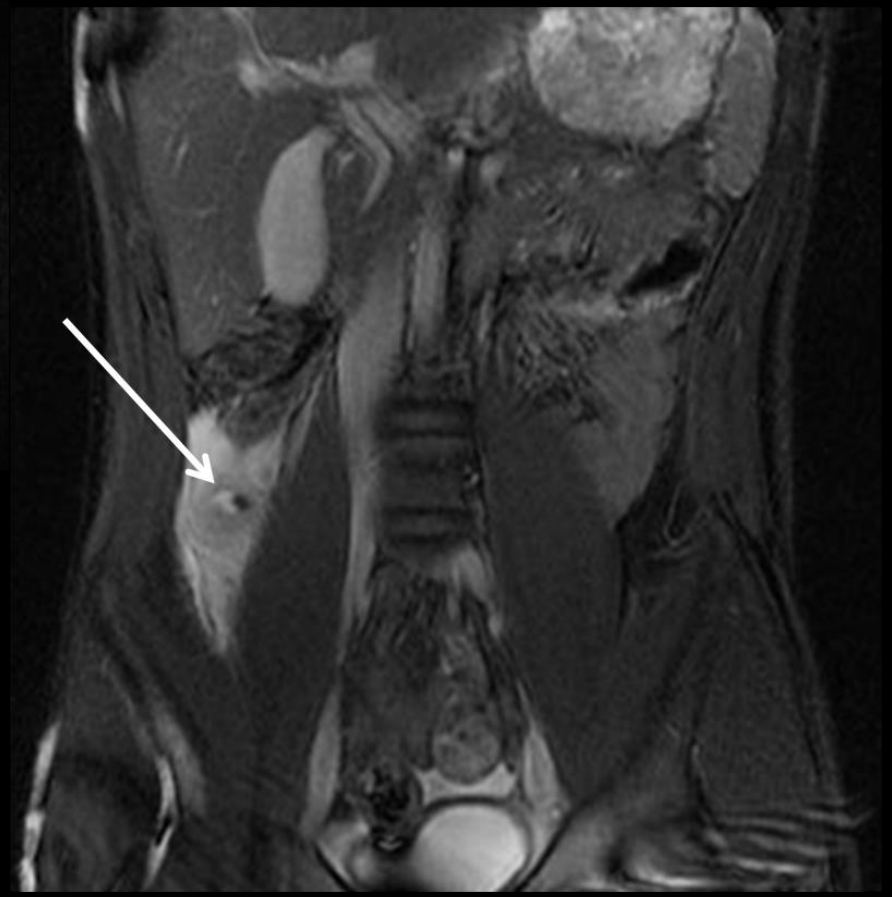


Figure 5b

Figure 3:
- Uncomplicated acute appendicitis in 10 year old boy

Figure 4:
- MRI used to diagnose pediatric acute appendicitis

Figure 5a & 5b:
- Perforated acute appendicitis in 16 year old

Patient MRI

Figure 6 – axial t2 (appendix)

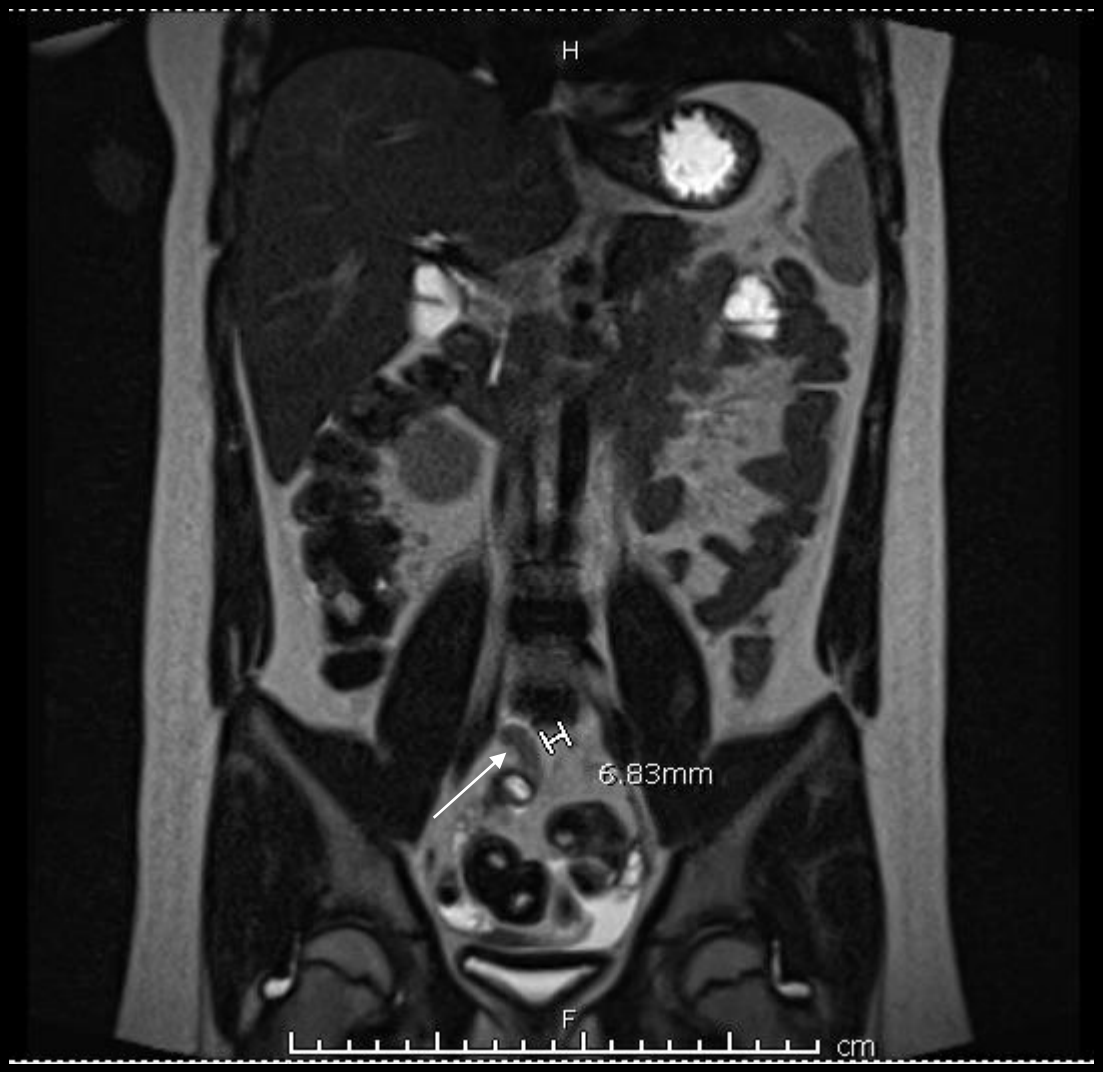


Figure 7 – coronal t2 (appendix)

Patient MRI

Figure 8 – axial t2 (omentum)

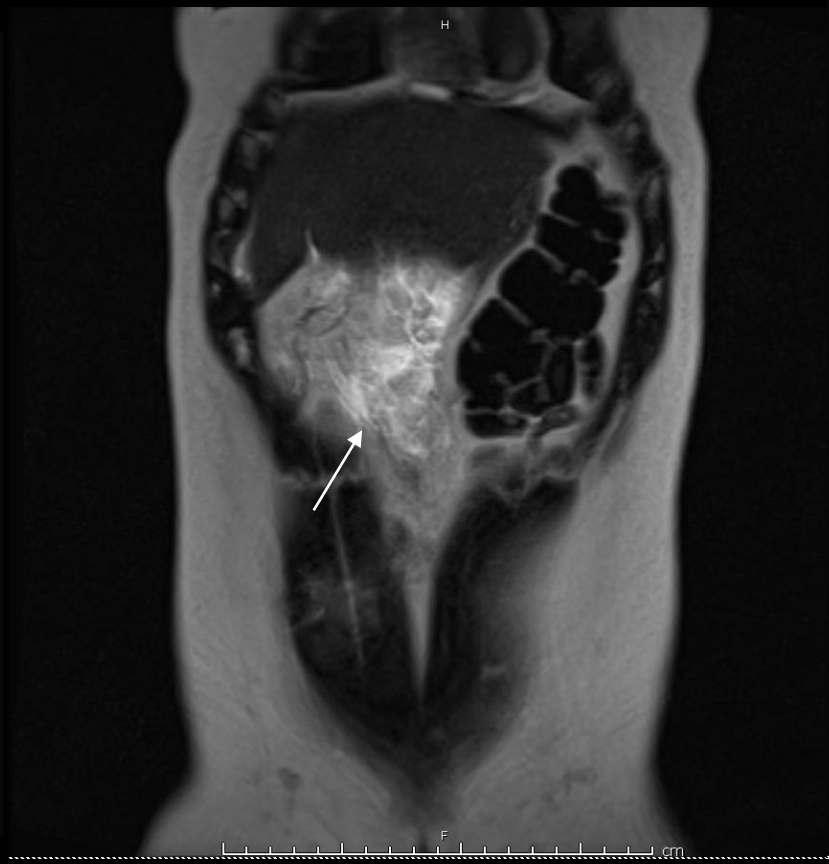


Figure 9 – coronal t2 (omentum)

Figure 10 – sagittal t2 (omentum)

Key findings

- Clinical Exam
  - +murphy's sign
  - Abdominal tenderness/guarding
  - Elevated temperature
  - Normal WBC count, neutrophilic predominance
- Imaging
  - Appendix in the pelvis with possible filling defect
  - Free fluid in pelvis
  - Complex inflammatory collection near the umbilicus

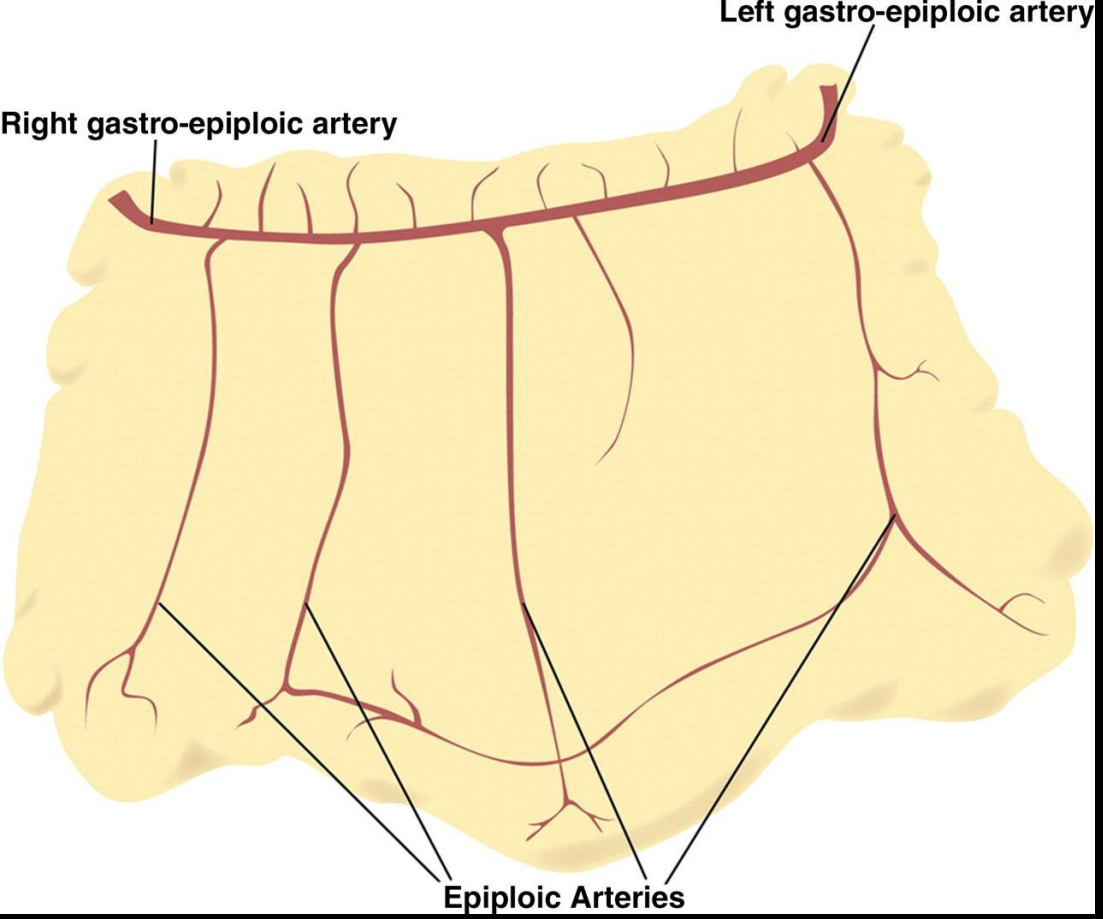
Patient transferred to MHH pediatric surgery team for presumed acute appendicitis

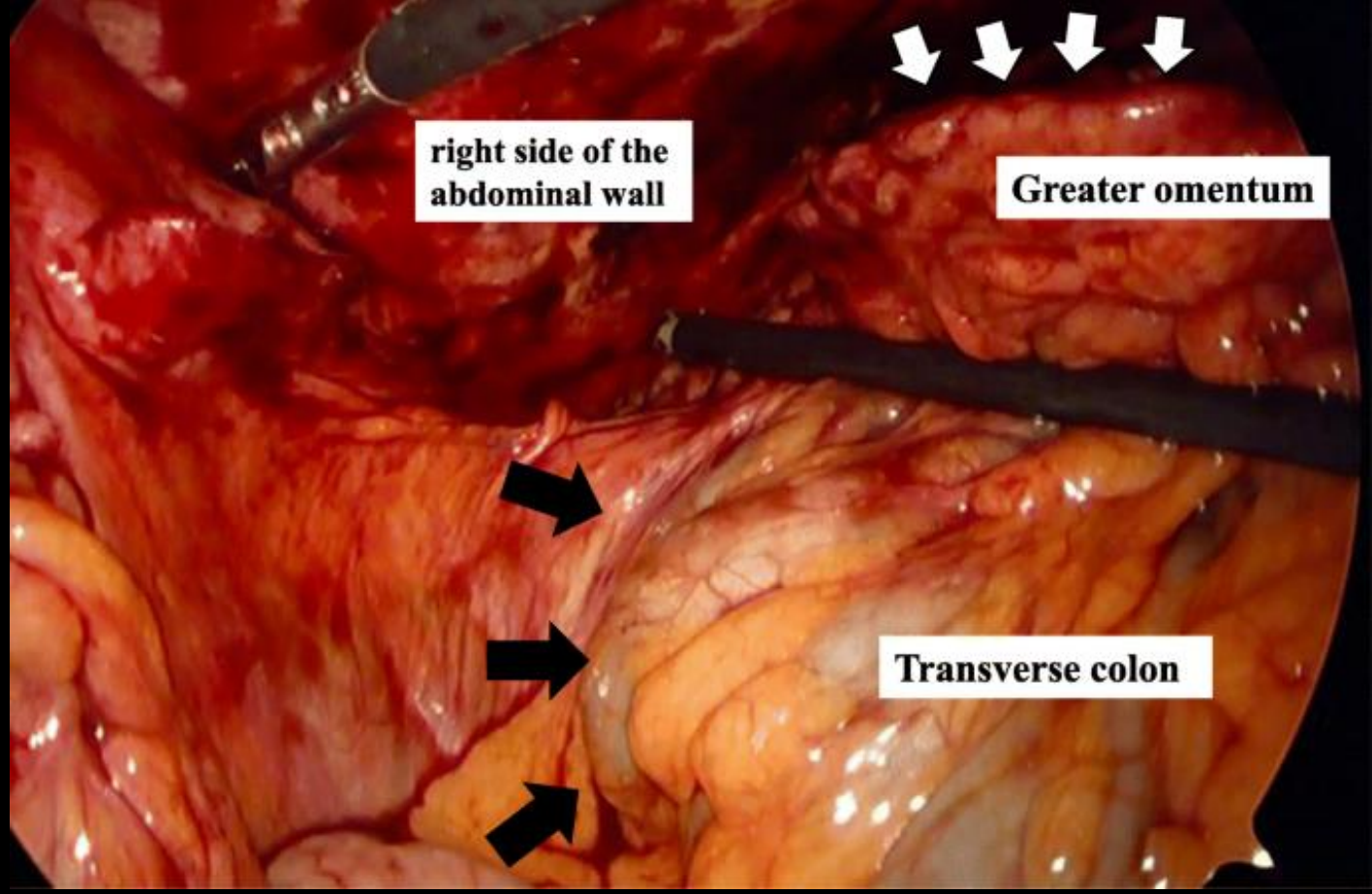
DDX of imaging findings

- Acute appendicitis
- Omental infarction
- Encapsulated fat necrosis
- Epiploic appendagitis

Outcome

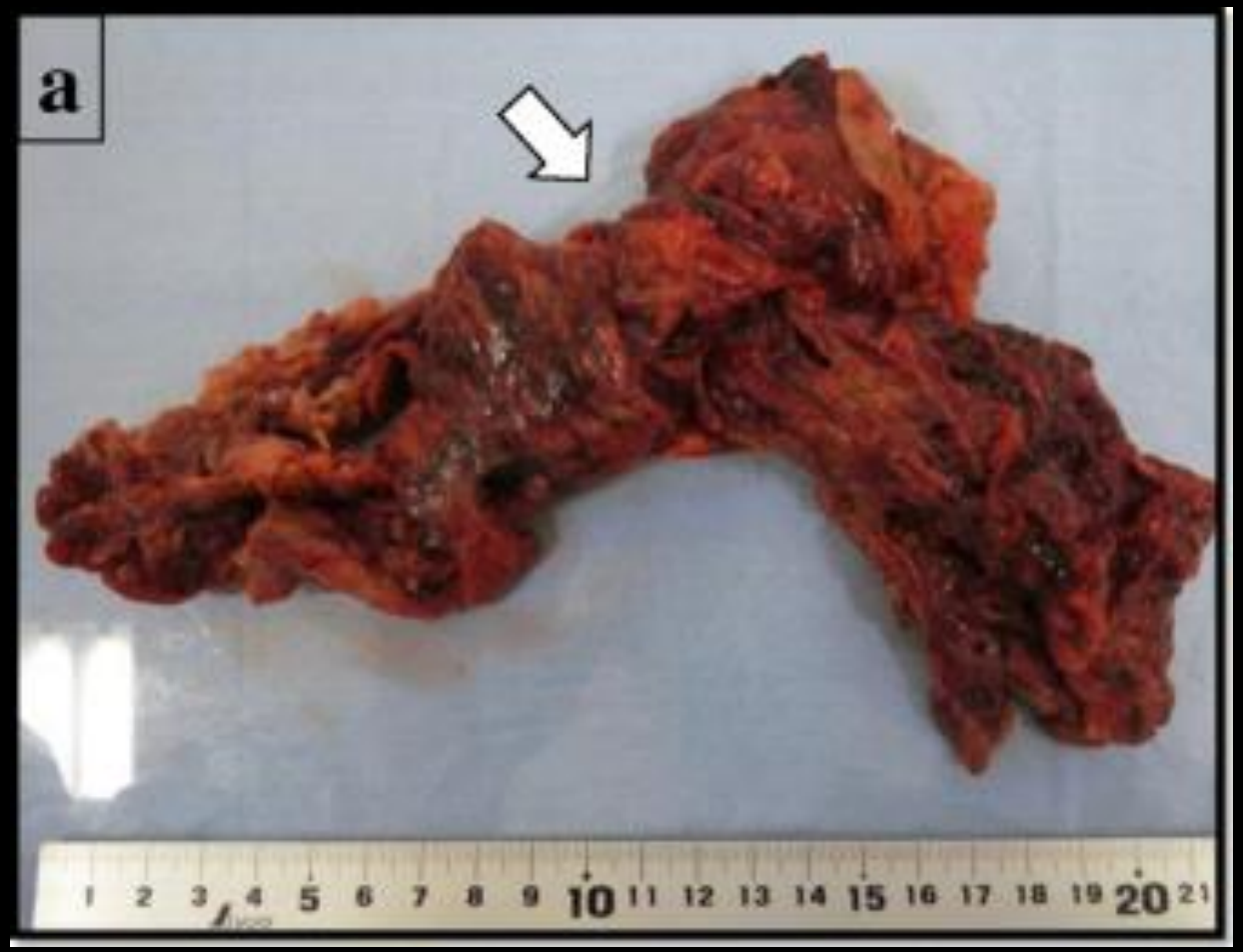
- Patient underwent exploratory laparoscopy at MHH with omental resection and appendectomy (6/2)
- Found acute omental infarction with no evidence of appendicitis
- Discharged in stable condition the following day (6/3)

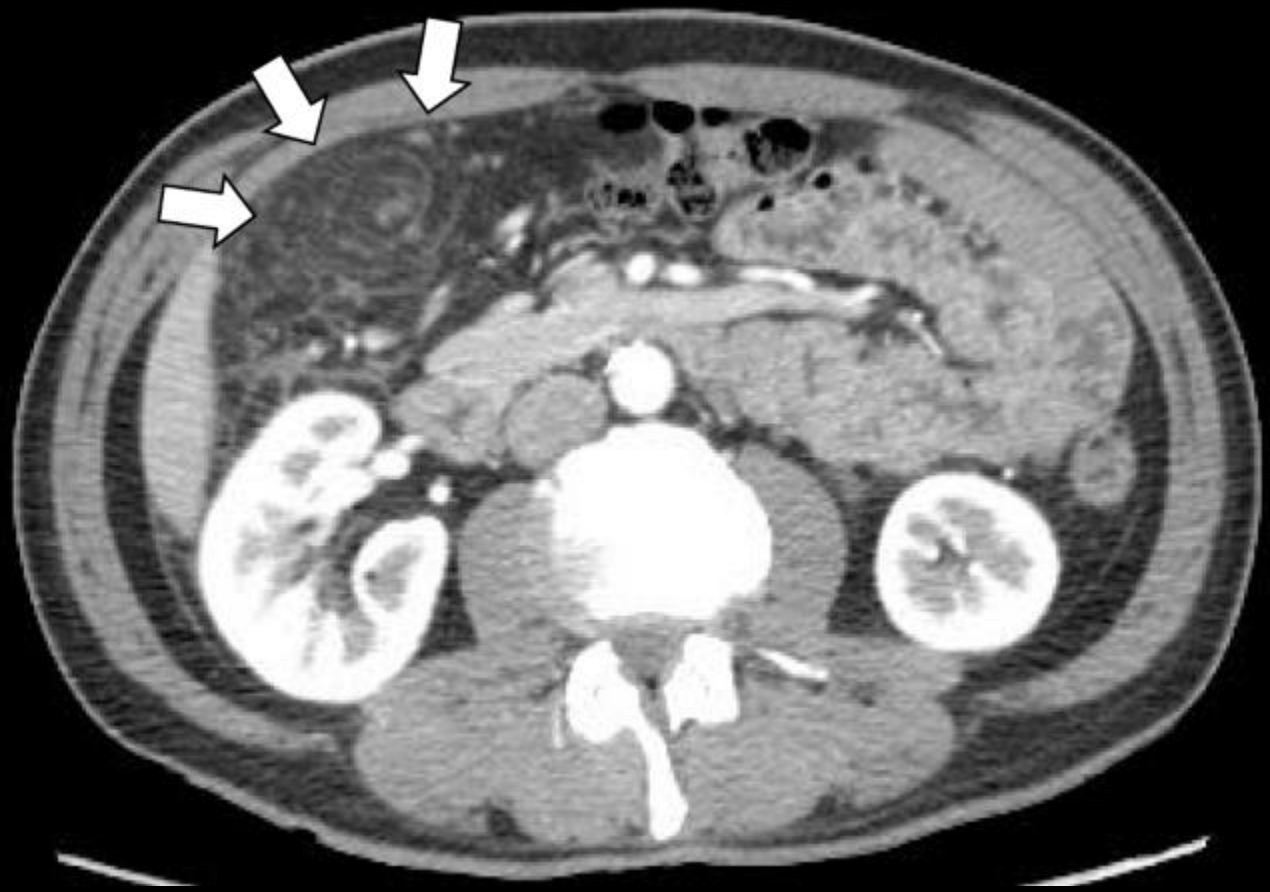




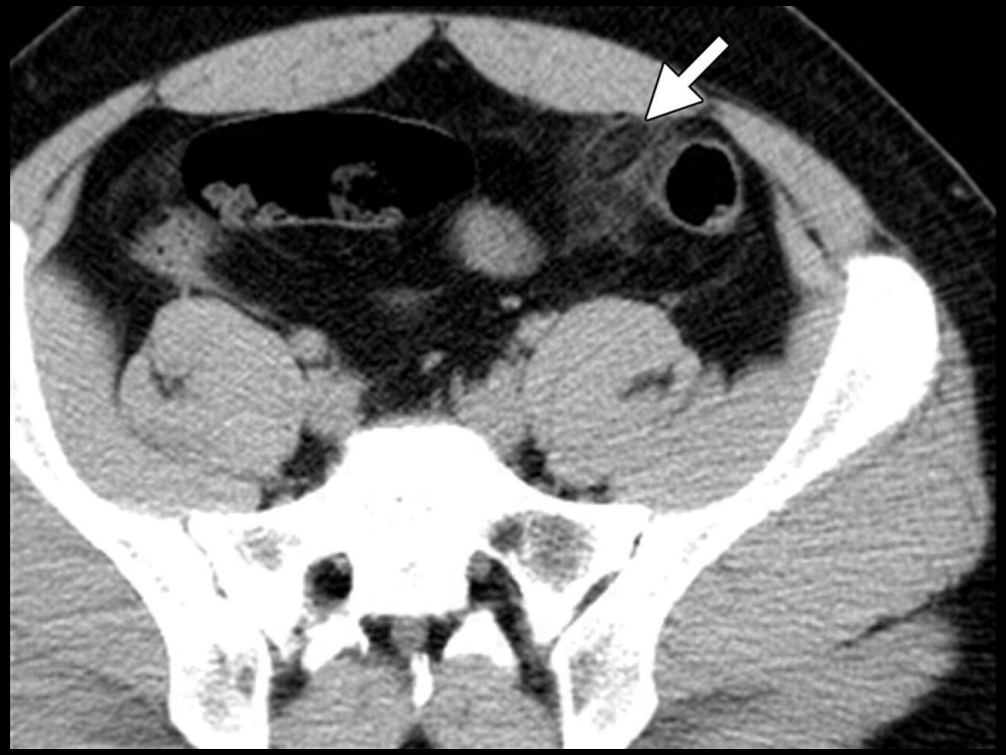
Discussion |

- Primary infarction usually hemorrhagic and due to vascular compromise
  - Hypercoagulable states
  - Congestive heart failure
  - Vasculitis
  - Marathon runners





- Presentation similar to acute appendicitis or acute cholecystitis
  - Subacute onset of RLQ pain
  - Slightly elevated WBC count
  - Absence of nausea/vomiting
  - ±Fever



Epiploic appendigitis

- Torsion and ischemic infarction of epiploic appendages
- Clinical symptoms mimic appendicitis, laboratory results usually normal
- Conservative treatment – self limited condition with spontaneous resolution

Encapsulated fat necrosis

- Typically secondary to trauma – can occur at any fat collection in the body
- Focally tender to palpation
- Can be associated with inflammation and a complex imaging appearance
- Usually self resolves over the course of years

Surgical
or
conservative
management?

J Pediatr Surg. 2018 Jul;53(7):1360-1364. doi: 10.1016/j.jpedsurg.2018.02.047. Epub 2018 Feb 15.

Diagnosis and management of omental infarction in children: Our 10 year experience with ultrasound

Robert McCusker [1], Roger Gent [2], Day Way Goh [3]

- 30 pediatric patients with OI
- 17 managed conservatively
- 13 managed operatively

THE JOURNAL OF PEDIATRICS • www.jpeds.com ORIGINAL ARTICLES

Omental Infarction in Children

Ayelet Rimon, MD, Alan Daneman, MD, J. Ted Gerstle, MD, and Savithiri Ratnapalan, MBBS, MEd

- 19 pediatric patients with OI
- 14 managed conservatively
- 5 managed operatively due to misdiagnosis of acute appendicitis

OMENTAL INFARCTION: SURGICAL or CONSERVATIVE TREATMENT? A CASE REPORTS and CASE SERIES SYSTEMATIC REVIEW

N.A. Medina-Gallardo (MD, PhD)[a,*], Y. Curbelo-Peña (MD)[a], T. Stickar (MD)[a], J. Gardenyes (MD)[a], S. Fernández-Planas (MD)[a], P. Roura-Poch (MD)[b], H. Vallverdú-Cartie (MD, PhD)[a]

- 90 studies examined, 146 patients
- 107 managed conservatively, failure rate of 15.9% - 5.1 day avg. hospital stay
- 39 patients managed operatively – 2.5 day avg. hospital stay

ACR appropriateness Criteria

Variant 2: **Child. Suspected acute appendicitis, intermediate clinical risk. Initial imaging.**

Procedure	Appropriateness Category	Relative Radiation Level
US abdomen RLQ	Usually Appropriate	O
US abdomen	Usually Appropriate	O
CT abdomen and pelvis with IV contrast	May Be Appropriate (Disagreement)	☢☢☢☢
CT abdomen and pelvis without IV contrast	May Be Appropriate (Disagreement)	☢☢☢☢
MRI abdomen and pelvis without and with IV contrast	May Be Appropriate (Disagreement)	O
MRI abdomen and pelvis without IV contrast	May Be Appropriate (Disagreement)	O
Radiography abdomen	May Be Appropriate (Disagreement)	☢☢
CT abdomen and pelvis without and with IV contrast	Usually Not Appropriate	☢☢☢☢☢
US pelvis	Usually Not Appropriate	O

ACR appropriateness Criteria

Variant 4: **Child. Suspected acute appendicitis, equivocal or nondiagnostic right lower quadrant ultrasound. Next imaging study.**

Procedure	Appropriateness Category	Relative Radiation Level
CT abdomen and pelvis with IV contrast	Usually Appropriate	☢☢☢☢
MRI abdomen and pelvis without and with IV contrast	Usually Appropriate	O
MRI abdomen and pelvis without IV contrast	Usually Appropriate	O
CT abdomen and pelvis without IV contrast	May Be Appropriate (Disagreement)	☢☢☢☢
US abdomen	May Be Appropriate (Disagreement)	O
US abdomen RLQ	May Be Appropriate	O
CT abdomen and pelvis without and with IV contrast	Usually Not Appropriate	☢☢☢☢☢
US pelvis	Usually Not Appropriate	O
Radiography abdomen	Usually Not Appropriate	☢☢

Take Home Points / Teaching points

- There are several self-resolving pathologies that mimic acute appendicitis
- Omental infarction is a rare but important cause of abdominal pain in children
- Identifying OI correctly on imaging can prevent unnecessary surgical procedures

References

- https://acsearch.acr.org/docs/3105874/Narrative/
- https://www.ajronline.org/doi/full/10.2214/AJR.13.11030?mobileUi=0
- https://pubs.rsna.org/doi/full/10.1148/rg.275065021
- https://www.semanticscholar.org/paper/MRI-of-the-normal-appendix-in-children%3A-data-toward-Swenson-Schooler/92bd6ba04e8a1e32ee47092eefcd42479714c333
- https://www.researchgate.net/figure/Uncomplicated-acute-appendicitis-MRI-in-a-10-year-old-boy-with-1-day-of-localized-right_fig1_303555596
- https://radiologypics.com/2014/03/21/perforated-appendicitis-mri/
- https://pubs.rsna.org/doi/full/10.1148/rg.317115046
- https://surgicalcasereports.springeropen.com/articles/10.1186/s40792-019-0618-5
- https://pubmed.ncbi.nlm.nih.gov/29550035/
- https://www.jpeds.com/article/S0022-3476(09)00319-9/abstract
- https://www.sciencedirect.com/science/article/pii/S2049080120301709
- https://radiopaedia.org/cases/omental-infarction-in-a-child-3?lang=us

Questions?