Imaging of Crohn’s Disease: What the Pediatric Gastroenterologist Wants to Know

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Disclosures

• I have no financial relationships to disclose
Help Me Help You

Jonathan Dillman
Learning Objectives

• Understand how imaging findings guide the clinical management of pediatric IBD in the following scenarios:
  – Diagnostic work-up
  – Disease refractory to medical therapy
  – Perianal disease
  – Acute exacerbation of Crohn’s disease
Case 1– Diagnostic work-up

• 9 year old girl
  – Decreased energy
  – Hard bloody stools x 6 months
  – Hasn’t changed clothes size in 2 years
  – Alb 2.9, CRP 1.9, Hgb 10.3
Work-up of suspected IBD

H&P/Labs
Suspect

Endoscopy
Diagnose

Imaging
Characterize
Evolution of IBD Treatment Decisions

Risk-Based

Low

High

Extensive disease
Perianal Disease
Stricturing/Penetrating
Case 1 - Endoscopic abnormalities in the TI

Nodularity, exudates

Linear ulcer
What do I want to learn from imaging in the initial work-up of IBD?

- Presence of small bowel disease
- Extent of small bowel disease
- Complications
  - Stricture
  - Fistula or Abscess
Bowel wall thickening with mucosal hyperenhancement of a long segment of terminal ileum (~40 cm).
Case 1 – Tx Response and Loss of Response

- Given deep ulceration on endoscopy and long segment of affected ileum we started her on the anti-TNF biologic infliximab
- Did excellent for 1 year with excellent growth
- Developed worsening nausea, intermittent abdominal pain and vomiting, and difficulty passing bowel movements along with rising CRP
Loss of response to ant-TNF drugs

Loss of response to ant-TNF

Antibodies to drug? Optimize anti-TNF dosing

Surgery vs. Alternate drug
What do I want to learn from imaging in the setting of medically refractory disease?

- Active inflammation
- Complication requiring surgery
  - Stricture
  - Fistula or Abscess
- Limited segment of disease amenable to surgery
Long segment (≥ 30cm) distal ileum with intermittent areas of bowel wall thickening, transmural hyperenhancement, and luminal narrowing with pseudosacculations.

Images courtesy of Jonathan Dillman, MD, MSc
Surgery

- Imaging identified limited segment of fibrotic bowel likely amenable to surgery
- 70 cm of diseased terminal ileum identified at surgery
- In effort to possibly preserve bowel, elected to defer resection and perform a diverting loop ileostomy proximal to the diseased ileum
- 6 months of optimized medical therapy with diversion of fecal stream
- Ileoscopy: Healed mucosa but stricture
Contrast study of diverted ileum shows numerous fixed strictures

Patient underwent an ileocecal resection with anastomosis and is doing excellent 3 months post-operatively

Image courtesy of Jonathan Dillman, MD, MSc
Case 2 – Diagnostic work-up

- 12 year old boy, “not been right the past 9 months”
- No weight gain of linear growth past 1 year
- Unexplained recurrent low grade fevers
- Periumbilical abdominal pain
- Hgb 11.2, CRP 2.35, Albumin 2.5
- Fecal calprotectin 750 (High).
Case 2 - Mild findings on Endoscopy

- Duodenum
  - Scalloping

- Colon
  - Aphthoid Ulcer

- Ileocecal Valve

- Ileum
Multiple regions of hyperenhancement, bowel wall thickening creeping fat and restricted diffusion mostly involving the jejunum
Case 2: Management and Clinical Course

- Imaging revealed extensive jejunal disease
- Started on infliximab on the basis of imaging findings
Case 3 – Perianal Crohn’s Disease

- 16 year old boy with findings consistent with recurrent perianal abscess partially responsive to antibiotics
- Concern for Crohn’s disease with perianal involvement
- MRE and MRI of the Pelvis Obtained
What do I want to learn from imaging of perianal Crohn’s disease

- The key to successful management is to establish adequate drainage of all abscesses and to control fistula healing.
- The purpose of the MRI is to provide a roadmap to this end.
- Combining imaging with EUA improves accuracy of perianal fistula classification from 90 to ~100%.

Parks Classification

A: Superficial
B: Intersphincteric
C: Trans-sphincteric
D: Suprasphincteric
E: Extrasphincteric

External anal sphincter

Slide courtesy of David Schwartz, MD, Vanderbilt University
Simple vs. Complex

Slide courtesy of David Schwartz, MD, Vanderbilt University
More likely to obtain long-term healing of complex fistulas with seton drainage

Mild nodular wall thickening of the terminal ileum with mild increased mural enhancement

Associated restricted diffusion
Transsphincteric perianal fistula extending from anterior anorectal junction to the skin surface at junction of gluteal cleft and left gluteal fold. No associated abscess.
Endoscopic Findings

Scattered aphthoid ulcers in the rectosigmoid with normal adjacent colon

Ulcer on ileocecal valve

Ileal inflammation
Case 3: Management and Course

- Underwent examination under anesthesia and seton placement
- Imaging assisted in identifying tract
- Started on adalimumab 40 mg every other week
- 3 months later – scant drainage around seton
- Follow-up MRE at 4 months
  - Is fistula tract inflammation resolved around the seton
Imaging to guide medical and surgical management of perianal Crohn’s disease

• Radiologic healing of perianal fistulas lags behind clinical remission

• Fistulas with deep healing by imaging are more likely to remain closed long term with treatment

Tozer, et al. (2012). Inflammatory Bowel Diseases, 18(10), 1825–1834.
Inflammatory change along the course of the previously identified fistula. The inflamed area has decreased in size.
Case 3: Management and Course

- MRI suggested continued active inflammation in fistula tract
- Evidence that high anti-TNF levels are required to maximize fistula healing
- Left seton in place
- Increased adalimumab to 40 mg weekly
- Will re-evaluate by MRE in 3-4 months prior to removing seton

Case 4 – Acute exacerbation of Crohn’s

- 16 year old girl with autism and ileal Crohn’s disease on adalimumab
- Substantial ileal luminal narrowing on prior imaging
- 1-2 months of intermittent fevers
- “Shakes with pain” after eating
- Hasn’t eaten solids in 6 days
- HR 146
What do I want to learn from imaging for an acute exacerbation of Crohn’s disease

• Stricture with acute obstruction
• Abscess
  – Amenable to percutaneous drainage?
• Fistula?
Multiple bowel fistulas in the pelvis. Large fistula vs. abscess between the terminal ileum and the rectum
Case 4: Management and Clinical Course

• Imaging revealed a surgical complication including a possible abscess
• Treated with intravenous antibiotics and TPN
• Underwent laparoscopy and diverting loop ileostomy
  – Inflamed and dilated small bowel with distal ileum adhered to the colon down in the pelvis. Small bowel to pelvis, uterus and colon adhesions. Creeping fat along colon and small bowel.
• Will undergo second surgery after longer course of antibiotics, diversion of fecal stream, and improved nutrition.
## Summary

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YOU COMPLETE ME

Thank You!