Ulcerative Colitis: Radiological Manifestations

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Our Patient

• 57 year old female with a history of ulcerative colitis presented with four weeks of right lower quadrant pain and bloody diarrhea.

• Past Medical History:
  - Ulcerative Colitis
  - HTN
  - DM2
  - Asthma

• Family History: Negative for any GI problems
• Social History: Does not drink alcohol or use tobacco products
Our Patient: Physical Exam.

- Physical Exam;
  - T;98.5, BP;124/76, P;93, RR; 16, O2 100%.
  - HEENT: Normal
  - ABD: Soft with normal active bowel sounds, tenderness in RLQ, no rebound tenderness or guarding
  - Labs: mild normocytic anemia
    HG;10.7 and HCT,32.4
Differential Diagnosis

- UC flare
- Infectious Colitis
- Crohn’s Colitis
- Pseudomembranous Colitis
- Ischemic colitis
- Appendicitis
What radiological tests should be ordered?

Barium Enema
CT

- Radiological tests are not diagnostic but they help in narrow the differential diagnosis.
- CT is the most common test usually ordered and it accurately demonstrate inflammatory changes and extent of disease.
- BE is good for looking at mucosal detail of bowel wall
- Ulcerative colitis on CT and BE can be distinguished from crohn in terms of location, extent and appearance of colonic wall thickening.
- UC and Crohn rarely associated with ascites, which is often seen in infectious, ischemic and pseudomembranous colitis.
Ulcerative Colitis and Crohn disease are Inflammatory Bowel disease. Exact cause is unknown but it is believed that for some reason immune systems especially subset T-cells accumulate in the epithelial cells of GI tracts. This result in an increase B cells and plasma cells which in turn increase IgG and IgE. This leads to acute and chronic inflammatory process.
Crohn vs Ulcerative Colitis (UC)

**Crohn**
- Transmural
- Skip lesion
- Rectum not involved
- Fistula
- Mesenteric fat increase

**UC**
- Mucosal
- Continuous
- Rectum involved
- No Perirectal fat increase

[Diagram showing overlap of Crohn's disease and Ulcerative colitis with different features]

www.hopkins-gi.org
Classification of UC

A proctitis
B left-sided colitis
C pancolitis

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Normal Colon Under BE.

Hepatic Flexure

Splenic Flexure

Transverse Colon

Cecum

Sigmoid Colon

Rectum

BIDMC: Normal Colon under Double Contrast Barium Enema
Transverse CT image of normal colon

Transverse Colon

cecum

Descending Colon with normal wall thickness

BIDMC: PACS
Radiological Manifestations of Ulcerative Colitis

- **Acute Stage:**

  ➢ **Fine mucosal granularity** = edema, hyperemia, and abnormal mucin production.

  ![Double contrast BE of sigmoid colon](Imaging.consult.com)
Radiological manifestations of UC
Acute Stage

- Ulcerations = Two types
  a) Button type = Flask like ulcers with flat base
  b) Double tracking = these are longitudinal ulcers in submucosa.

![Double contrast BE shows collar button ulcers](Imaging.consult.com)

![Single-contrast BE of colon showing Ulcers](Courtesy of Dr Marc D Basson emedicine.medscape.com/article/183084-overview)
Radiological manifestations of UC

Acute Stage

- **Pseudopolyps** = raised area of inflamed tissue resembles polyps and severe ulcerations caused denuded area

![Double contrast BE of descending colon](https://imaging.consult.com)
Radiological Manifestations of Ulcerative Colitis
Acute / subacute stage.

➤ Target sign: Disproportionate edema in various layers of the bowel wall result in series of concentrated rings of varied attenuation.

- The inner and outer rings of high attenuation represent hyperemia of the mucosa and muscularis propria.
- The middle low attenuation represent submucosa edema.

Transverse CT with IV contrast
Imaging.consulting.com
Radiological Manifestations of Ulcerative Colitis
Chronic stage

- Loss of haustration on left side of colon = Damage to muscularis propria results in colonic dilation and loss of haustra.

Double contrast BE image of colon

Loss of haustra on left colon
In Crohn it is usually to right side
Radiological Manifestations of Ulcerative Colitis
Chronic Stage

- Filiform polyps (long worm like lesions)

Double contrast BE image of colon.
Radiological Manifestations of Ulcerative Colitis

Chronic stage

- **Backwash ileitis** = wide ileocecal valve and dilated terminal ileum. In UC no ulcers or fistula presents in terminal ileum.

Double contrast BE Image.

Loss of haustra
Radiological Manifestations of Ulcerative Colitis

Chronic stage

➢ Thickening of colonic and rectal wall = deposition of fat in submucosa and edema and
Infiltration of inflammatory cells in lamina propria

Transverse CT with contrast image shows diffuse mucosal thickening of fluid filled rectum and sigmoid. Deep ulcerations (white arrows)

Colonic wall thickness in UC is usually less prominent 7.8+1.7mm
In Crohn 11.0+5.1mm.
Coronal CT image of the abdomen and pelvis shows thickening of colonic wall (white arrows)

Roggeveen M J et al. Radiographics 2006;26:947-951
Arrow points distorted mucosa and narrowed Cecum. Arrowhead points to ulcers. Black arrow is normal small bowel.

Transverse CT with contrast shows thick walled terminal ileum (white arrows) Left side colonic wall is normal.
Crohn

Transverse CT with IV contrast image shows (white arrow) thick walled terminal ileum (Target sign)
OUR PATIENT

BIDMCPACS: Transverse CT with IV contrast image shows thickened colonic wall

Cecum

Thickening colonic wall. More than 3mm
Our Patient

BIDMC PACS: Coronal CT with IV contrast image of abdomen and pelvic shows colonic wall thickening.

- Ascending colon
- Cecum
- No mesenteric fat infiltration
- Colonic wall thickening
Our Patient

BIDMCPACS: Coronal CT with IV contrast image of Abdomen and pelvis shows Target sign.
Our Patient

BIDMCPACS: Coronal CT with IV contrast image shows loss of haustra
BIDMC PACS: Sagittal CT with IV contrast image shows thickened colonic wall
Radiological findings in our Patient

57 year old female with a history of UC presented with a acute symptoms of bloody diarrhea and right lower quadrant pain. CT exam was performed and findings were:

- Colonic wall thickening mostly on the left side
- Edema involving rectum, sigmoid and descending colon.
- Ahastral appearance involving left colon
- No fistula and fissure
- No Skip lesions
- No ascites
- No mass
- No blockage of the vessels
- No evidence of perforation
Conclusion.

These radiological finding strongly suggest acute proctocolitis secondary to chronic Ulcerative Colitis.

Because of acute nature of UC, colonoscopy was not performed. Rectosigmoidoscopy revealed edema and inflammations. She was treated with IV methyleprednisolone which subsided her symptoms and she was discharged on mesalamine and oral prednisone.
References

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Thank You