

AMSER Case of the Month

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Abdominal pain with nausea and vomiting

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Patient Presentation

- HPI: 58 year old female presents with abdominal pain, nausea, vomiting, fatigue, and progressive weight loss
- Physical Exam
 - Fever
 - Pallor
 - Abdominal distention
 - Abdominal tenderness
- Labs
 - Microcytic hypochromic anemia, Leukocytosis

What Imaging Should We Order?

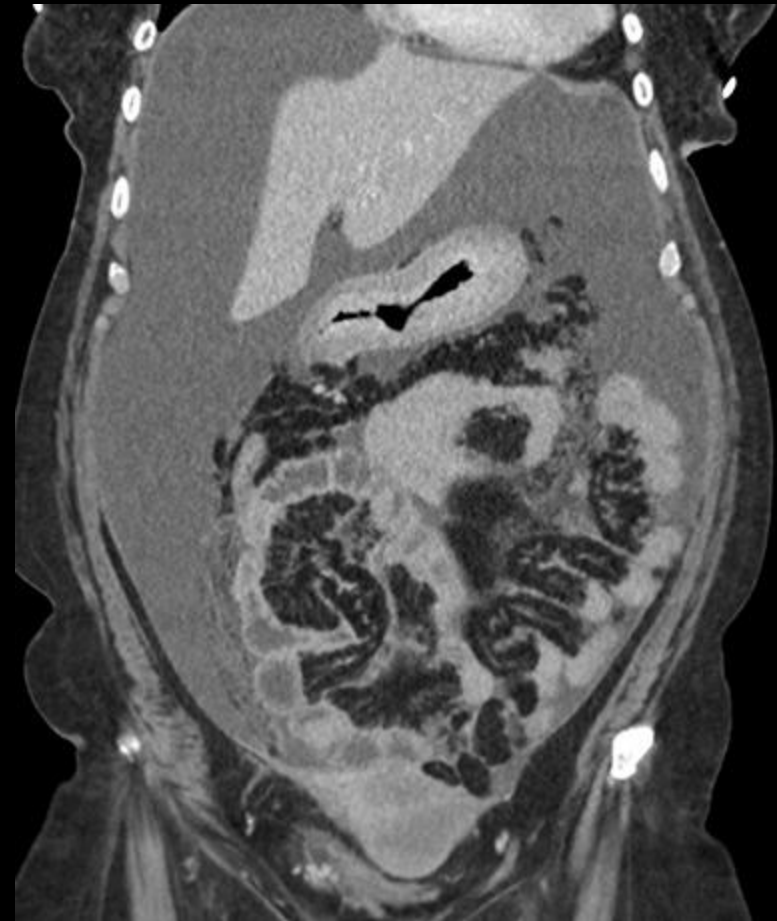
Select the applicable ACR Appropriateness Criteria

Variant 1: Acute nonlocalized abdominal pain and fever. No recent surgery. Initial imaging.

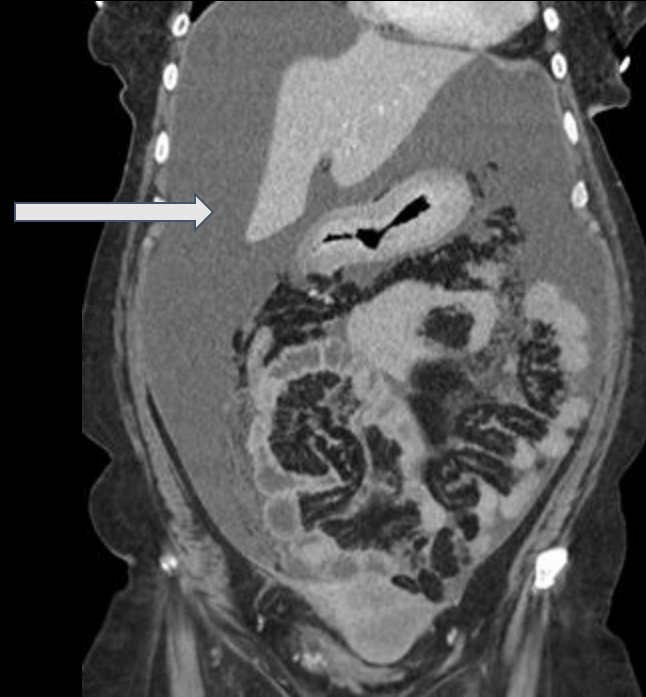
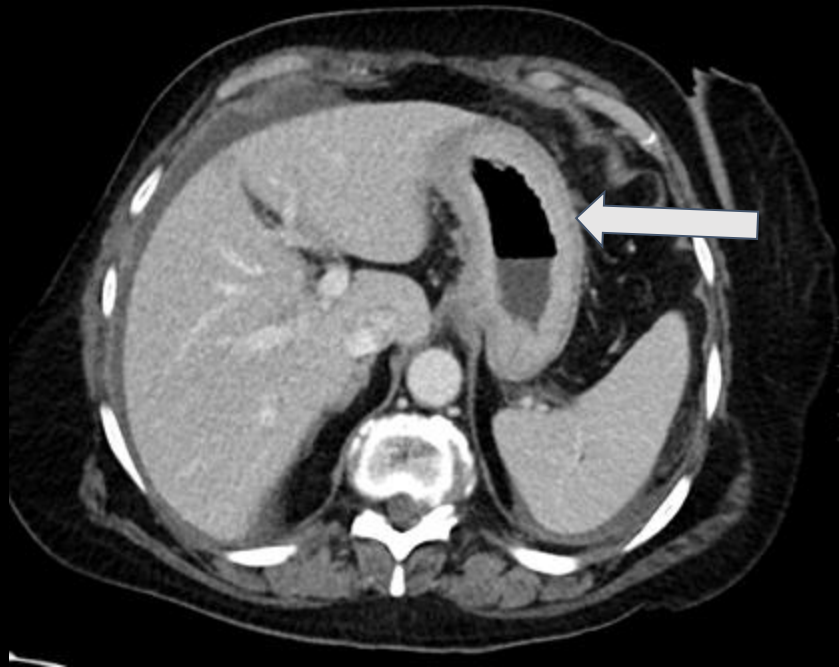
Procedure	Appropriateness Category	Relative Radiation Level
CT abdomen and pelvis with IV contrast	Usually Appropriate	☼☼☼☼
MRI abdomen and pelvis without and with IV contrast	May Be Appropriate	○
US abdomen	May Be Appropriate	○
CT abdomen and pelvis without IV contrast	May Be Appropriate	☼☼☼☼
MRI abdomen and pelvis without IV contrast	May Be Appropriate	○
CT abdomen and pelvis without and with IV contrast	May Be Appropriate	☼☼☼☼☼
Radiography abdomen	May Be Appropriate	☼☼
FDG-PET/CT skull base to mid-thigh	Usually Not Appropriate	☼☼☼☼☼
WBC scan abdomen and pelvis	Usually Not Appropriate	☼☼☼☼☼
Nuclear medicine scan gallbladder	Usually Not Appropriate	☼☼
Fluoroscopy contrast enema	Usually Not Appropriate	☼☼☼☼
Fluoroscopy upper GI series with small bowel follow-through	Usually Not Appropriate	☼☼☼☼

This imaging modality was ordered by the ED physician

Findings: (unlabeled)



Findings: (labeled)



- Left Image: Axial enhanced CT, arrow pointing to area of diffuse gastric wall thickening
- Right Image: Sagittal enhanced CT, arrow pointing to area of water attenuating fluid in the abdomen and pelvis (ascites)

Differential Diagnosis

- Gastric carcinoma (linitis plastica)
- Menetrier's Disease (hypertrophic Gastric Folds)
- Gastric lymphoma
- Gastritis/reactive changes
- Metastases to the Stomach

Patient taken for endoscopic evaluation/sampling

Final Dx:

Gastric Adenocarcinoma w/ Signet Ring Cell Features

Case Discussion

- **Imaging and endoscopy**
 - CT: Diffuse gastric wall thickening, nondistensible stomach → linitis plastica appearance
 - Endoscopy: Poor distension, irregular capillaries in “corkscrew” pattern, elongated or “stretched” gastric glands
 - Endoscopic ultrasound (EUS) - can determine depth of tumor invasion
 - Hypoechoic, transmural infiltration
 - Histology: Poorly cohesive tumor cells with intracytoplasmic mucin pushing the nucleus peripherally (signet ring morphology)

Case Discussion

- **Background**
 - Gastric cancer is the third most common cause of cancer death globally
- **Two major histologic types according to the Lauren classification**
 - Intestinal type - associated with chronic gastritis, intestinal metaplasia, H. pylori
 - Diffuse type - includes signet ring cell carcinoma, infiltrative growth
- **Clinical presentation of diffuse type**
 - Presents late because the tumor infiltrates diffusely rather than forming a mass
 - Common symptoms: early satiety, epigastric pain, weight loss, nausea, iron deficiency anemia
 - Advanced findings: ascites, peritoneal metastases, lymphovascular invasion

Case Discussion

- **Differential Diagnosis - Linitis Plastica**
 - CT findings - Diffuse gastric wall thickening, rigid, and loss of distensibility, often referred to as a “leather bottle” appearance
 - possible findings of ascites or peritoneal metastasis
 - Most commonly caused by diffuse-type gastric adenocarcinoma with signet ring cell features, but can also be mimicked by benign or other infiltrative conditions
 - Significance - When linitis plastica pattern is seen, neoplasm must be ruled out first, as malignant infiltration carries a poor prognosis and may present subtly on imaging
 - Imaging alone cannot distinguish malignant from benign causes, endoscopy and biopsy required for confirmation

Case Discussion

- **Risk Factors**

- Genetic

- CDH1 germline mutation
 - lifetime risk of gastric cancer up to 70% in men, 56% in women
 - Lynch syndrome (for general gastric adenocarcinoma)

- Environmental

- H. pylori infection
 - more strongly linked to intestinal type
 - smoking
 - high salt diet

- **Demographic**

- Female, younger age

Case Discussion

- **Prognosis**
 - Diffuse type adenocarcinoma has a worse prognosis than intestinal type, due to late presentation and higher rates of peritoneal spread
 - Has lower response to chemotherapy compared to intestinal type
- **Management**
 - Positive germline CDH1 mutation → risk reduction surgery
 - Surgical resection w/ lymph node dissection
 - Questionable benefit from chemotherapy/radiotherapy due to signet cell cancer being chemoresistant

References:

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