

AMSER Case of the Month

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38 y.o. female with acute onset of nausea, vomiting, and diarrhea

Simran Kripalani MS4

Cooper Medical School of Rowan University

Vishaal Gudla MD PGY4

Pauline Germaine DO

Cooper University Hospital

MD Anderson  Cooper
~~Cancer Center~~

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AMSER

Patient Presentation

- **HPI:** 38yo woman with nausea, vomiting, and diarrhea. Patient reports subjective sweating, abdominal pain, and cramping. She states she is in withdrawal, as she uses heroin 3x/day, but has not done so recently.
- **PMH:** opioid use disorder (OUD), cannabis use; SMA syndrome diagnosed one year prior to current presentation, managed conservatively (nutritional support, feeding tube)
- **Meds:** methadone (not taking), Zofran
- **Allergies:** NKA
- **Vitals:** Temp 97.7 °F, HR 103, BP 135/81, SpO2 100%, BMI 20.2, Pain 10/10
- **Physical Exam:** ill-appearing woman laying down on stretcher in acute distress, agitated, with continuous vomiting and dry heaving, diffuse abdominal tenderness and guarding, tachycardic, normal pulmonary effort and breath sounds, skin is warm and dry, mental status WNL

Pertinent Labs

- **Glucose:** 146
- **Mg:** 1.9
- **Na:** 141
- **K:** 3.4
- **WBC:** $6.55 \times 10^3 / \mu\text{L}$
- **Hgb:** 15.0
- **EKG:** Sinus bradycardia with sinus arrhythmia, Minimal voltage criteria for LVH, may be normal variant (Sokolow-Lyon)

What Imaging Should We Order?

ACR Appropriateness Criteria

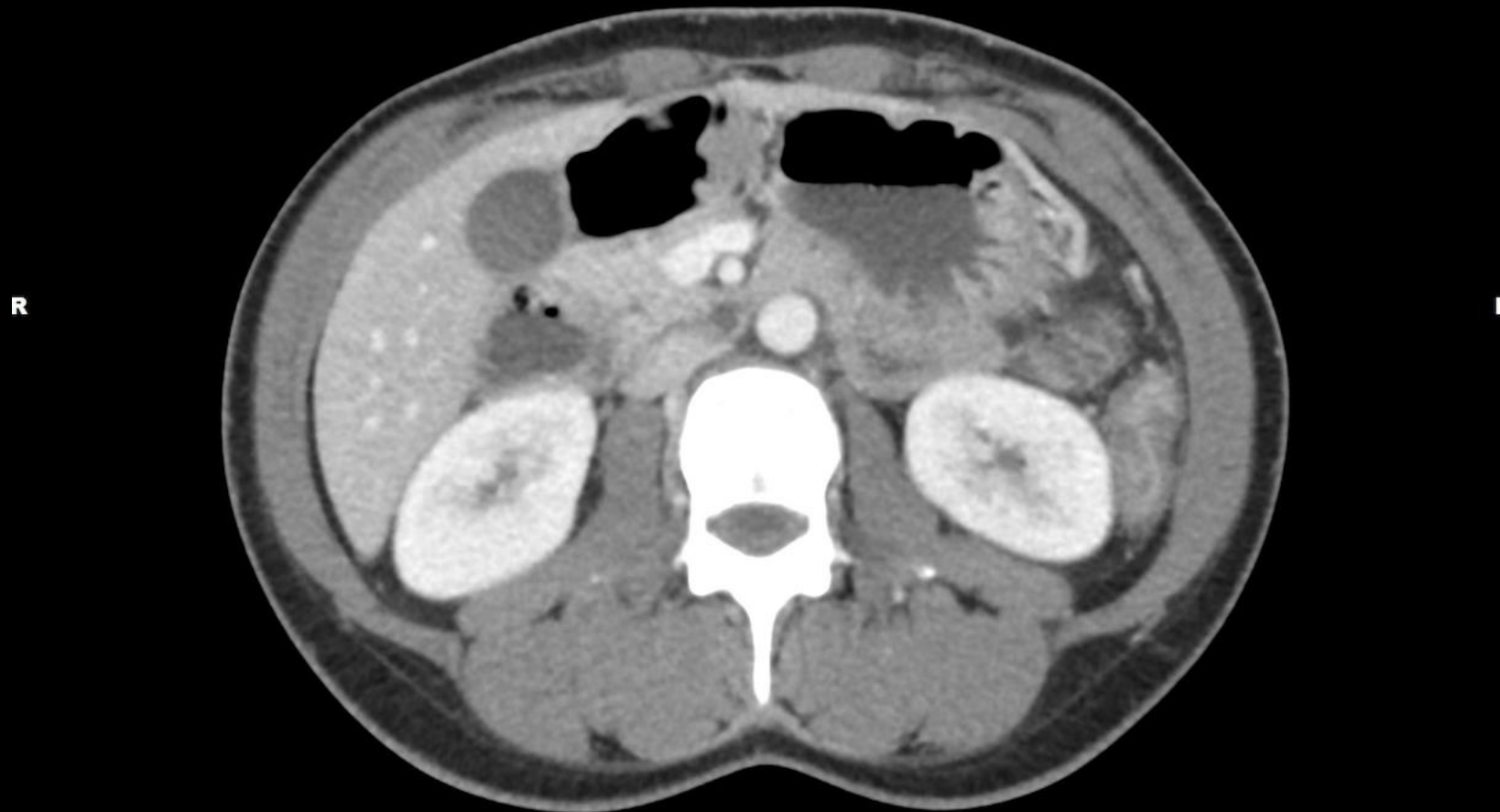
Variant 4:

Acute nonlocalized abdominal pain. Not otherwise specified. Initial imaging.

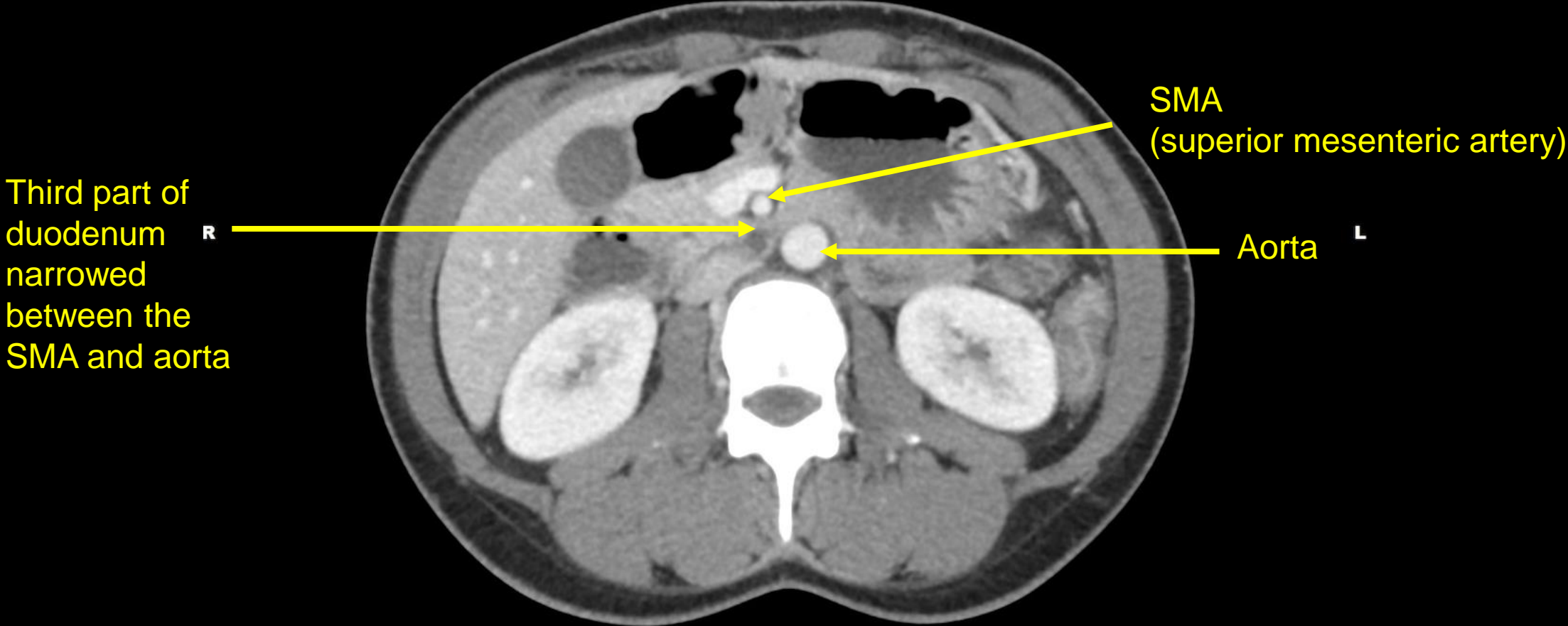
Procedure	Appropriateness Category	Relative Radiation Level
CT abdomen and pelvis with IV contrast	Usually Appropriate	☼☼☼
CT abdomen and pelvis without IV contrast	Usually Appropriate	☼☼☼
MRI abdomen and pelvis without and with IV contrast	Usually Appropriate	○
US abdomen	May Be Appropriate	○
MRI abdomen 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 upper GI series with small bowel follow-through	Usually Not Appropriate	☼☼☼
Fluoroscopy contrast enema	Usually Not Appropriate	☼☼☼

This imaging modality was ordered by the ER physician

Findings (unlabeled)



Findings (labeled)



Third part of duodenum narrowed between the SMA and aorta

R

SMA (superior mesenteric artery)

Aorta L

Findings (unlabeled)



Findings (labeled)

Dilated stomach and proximal duodenum likely due to compression of the third part of the duodenum

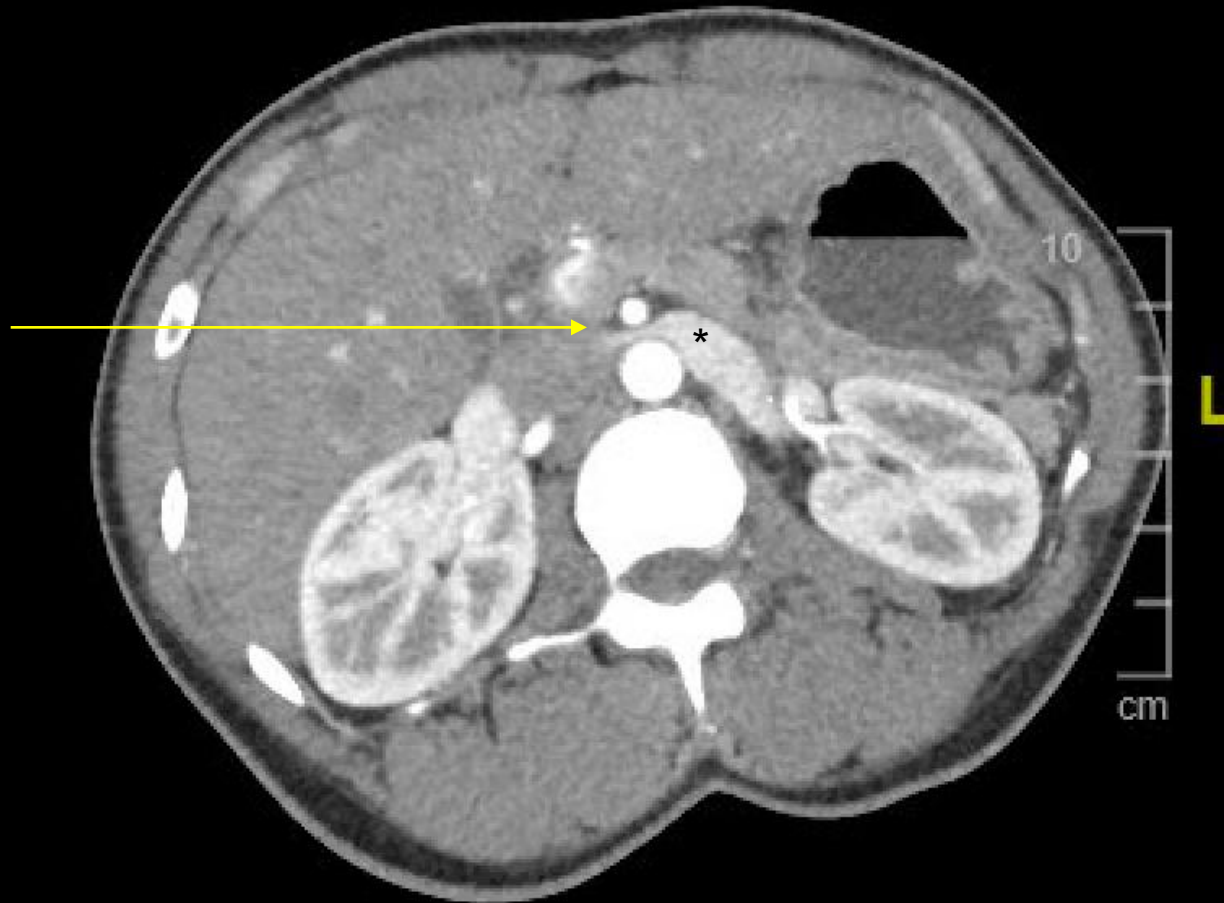


Findings (unlabeled)

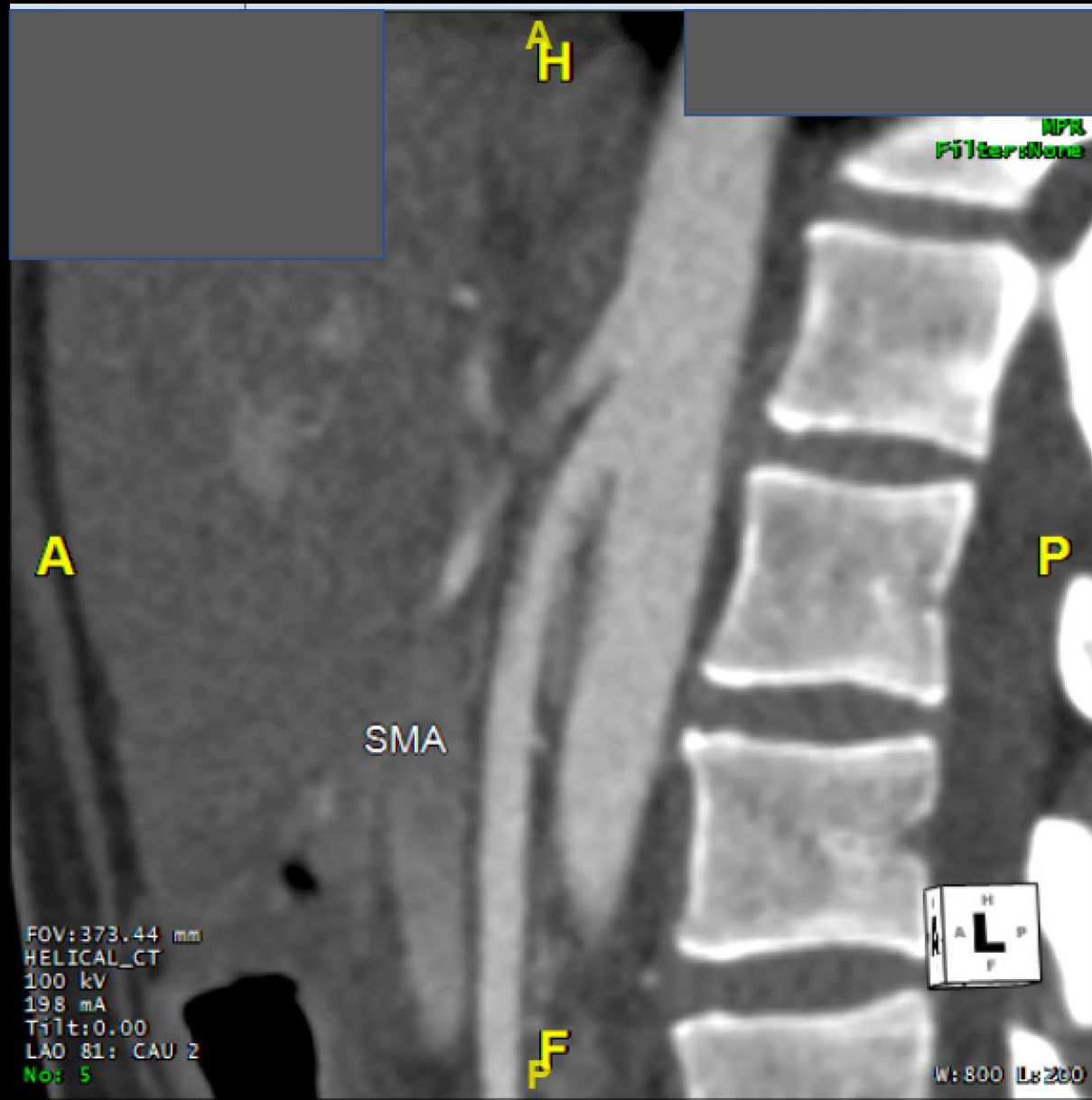


Findings (labeled)

Dilated left renal vein (*) with compression between the abdominal aorta and the SMA

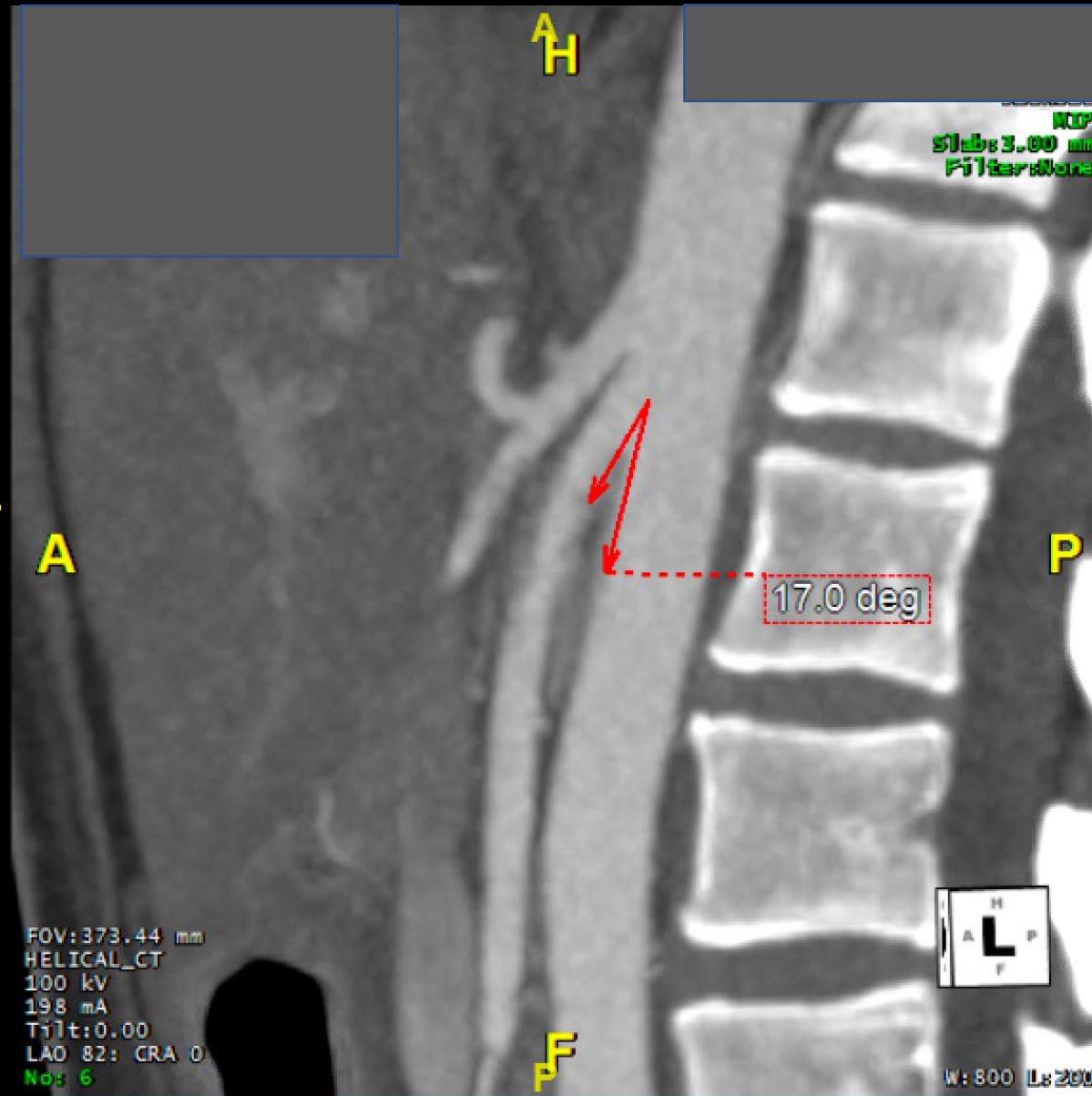


Findings (unlabeled)



Findings (labeled)

Decreased aortomesenteric angle of 17 degrees, resulting in dilatation of the left renal vein



Final Dx:

SMA syndrome and Nutcracker Syndrome

SMA Syndrome

- **Etiology:** loss of the mesenteric fat between the superior mesenteric artery and aorta leading to compression of the third portion of the duodenum due to sharp angle between the aorta and SMA.
- **Clinical Presentation:** nonspecific abdominal pain, postprandial epigastric pain, early satiety, nausea, reflux, bilious emesis, and weight loss
- **Differential Diagnosis:** substance withdrawal vs. hyperemesis cannabinoid syndrome vs. gastroenteritis vs. anorexia vs. bulimia vs. small or large bowel obstruction vs. diseases associated with duodenal dysmotility (i.e., diabetes mellitus, collagen vascular disease, scleroderma, and chronic idiopathic intestinal pseudo-obstruction)

SMA Syndrome: Diagnosis

- **Abdominal radiographs:** may reveal findings suggestive of proximal small bowel obstruction (gastric distension, proximal duodenum dilation, or abrupt vertical cutoff of air in third portion of duodenum)
- **Oral contrast studies:** UGI series usually reveals marked delay in passage of contrast from duodenum into distal small bowel
- **Transabdominal ultrasound:** measure angle between SMA and aorta with doppler
- **Arteriography with barium contrast:** SMA superimposed upon the barium-filled duodenum
- **CT and magnetic resonance (MR) arteriography:** noninvasive, provides additional anatomical detail

SMA Syndrome: Treatment

- **Conservative:**

- GI decompression (NGT, NPO)
- Correction of electrolyte abnormalities
- Nutritional support (IV fluids, enteral nutrition through nasojejunal feeding tube, TPN)
- Additional psychological services if secondary to eating disorder

- **Surgical:**

- Strong's procedure: mobilizes the duodenum by dividing the ligament of Treitz
- Gastrojejunostomy
- Duodenojejunostomy with/without division or resection of fourth part of duodenum (laparoscopic approach)

Nutcracker Syndrome

- **Etiology:** compression of the left renal vein between the aorta and proximal superior mesenteric artery
- **Clinical Presentation:** flank pain, hematuria, abdominal or pelvic pain; in women it can cause pelvic congestion or varicose veins in pelvis or genital area; varicoceles in men; dyspareunia
- **Differential Diagnosis:** benign or malignant renal mass, glomerular bleeding, ureteral or kidney stone, stricture, BPH, prostate cancer, urethritis, trauma, drug side effects

Nutcracker Syndrome: Diagnosis

- **To evaluate for hematuria causes:**
 - Blood test
 - Urinalysis
 - Urine culture
 - Cytology
 - Urethrocystoscopy
 - CT urography
 - Renal biopsy
- **To confirm nutcracker syndrome diagnosis:**
 - Renal ultrasound with Doppler evaluation
 - CT abdomen and pelvis or MRI (cross-sectional imaging)
 - Venography (rare)

Nutcracker Syndrome: Treatment

- **Conservative:**

- Supportive treatment
 - Further development and weight gain in children can result in widening of acute aortomesenteric angle, thus relieving compression

- **Surgical:**

- Transposition of left renal vein
- Left renal vein transposition with patch angioplasty
- Left renal vein transposition with saphenous vein cuff
- Gonadal vein transposition
- Saphenous vein bypass
- Endovascular left renal vein stenting

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