Imaging features of post-operative complications of Bariatric procedures on contrast and non-contrast CT – Experience of an Emergency Teleradiology Practice

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AIMS AND OBJECTIVES

- The incidence of obesity and its comorbidities is rising, and so are the rates of bariatric surgery.
- The three main bariatric procedures are laparoscopic sleeve gastrectomy (SG), Roux-en-Y gastric bypass (RYGB), and laparoscopic gastric banding (GB).
- In this study we analyzed the imaging characteristics of early and late complications of bariatric procedures.

Contents

Pictorial review of imaging features of post-operative complications following bariatric procedures.

Retrospective evaluation of 51 CT Abdomen and pelvis studies without and/or with contrast acquired in the emergency radiology setting.

Study images were analyzed and various imaging characteristics of complications of bariatric procedures were documented.

The results were analyzed and compiled into a pictorial review.

Post-operative complications of Bariatric procedures

Laparoscopic sleeve gastrectomy-

- Postoperative leaks/ strictures and abscess
- Hemorrhage
- Splenic injury
- Porto-mesenteric thrombosis
- Gastric dilation
- Gastro-esophageal reflux

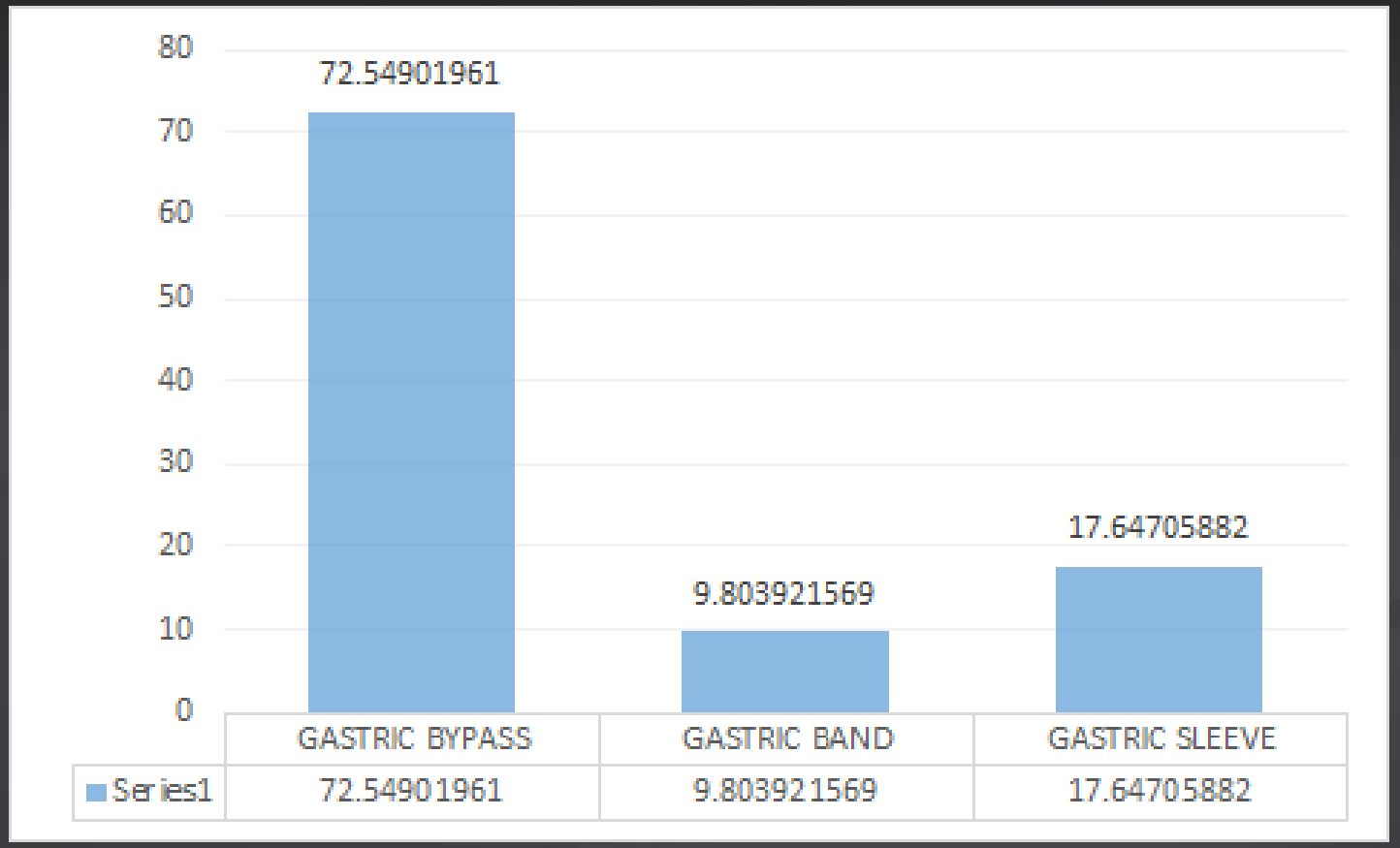
Laparoscopic gastric banding

- Stomal stenosis
- Mal positioned bands
- Pouch dilation
- Band slippage
- Perforation
- Gastric volvulus
- Intraluminal band erosion
- Port- and band related problems

Roux-en-Y gastric bypass

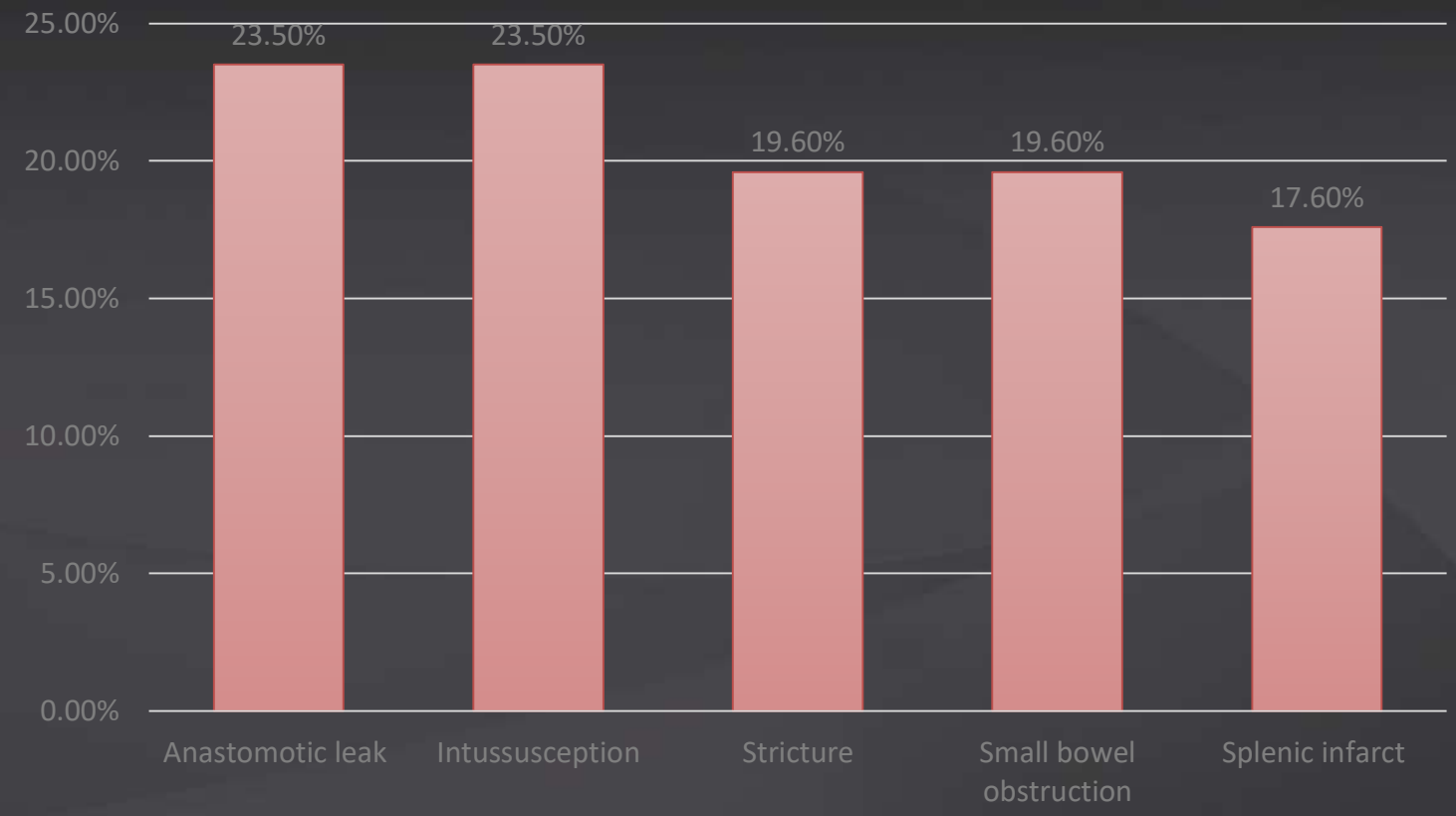
- Anastomotic leaks/strictures/abscess
- Marginal ulcers, Gastro gastric fistula
- Jejunal ischemia
- Hemorrhage
- Small bowel obstruction
- Internal hernias
- Intussusception
- Recurrent weight gain

RESULTS



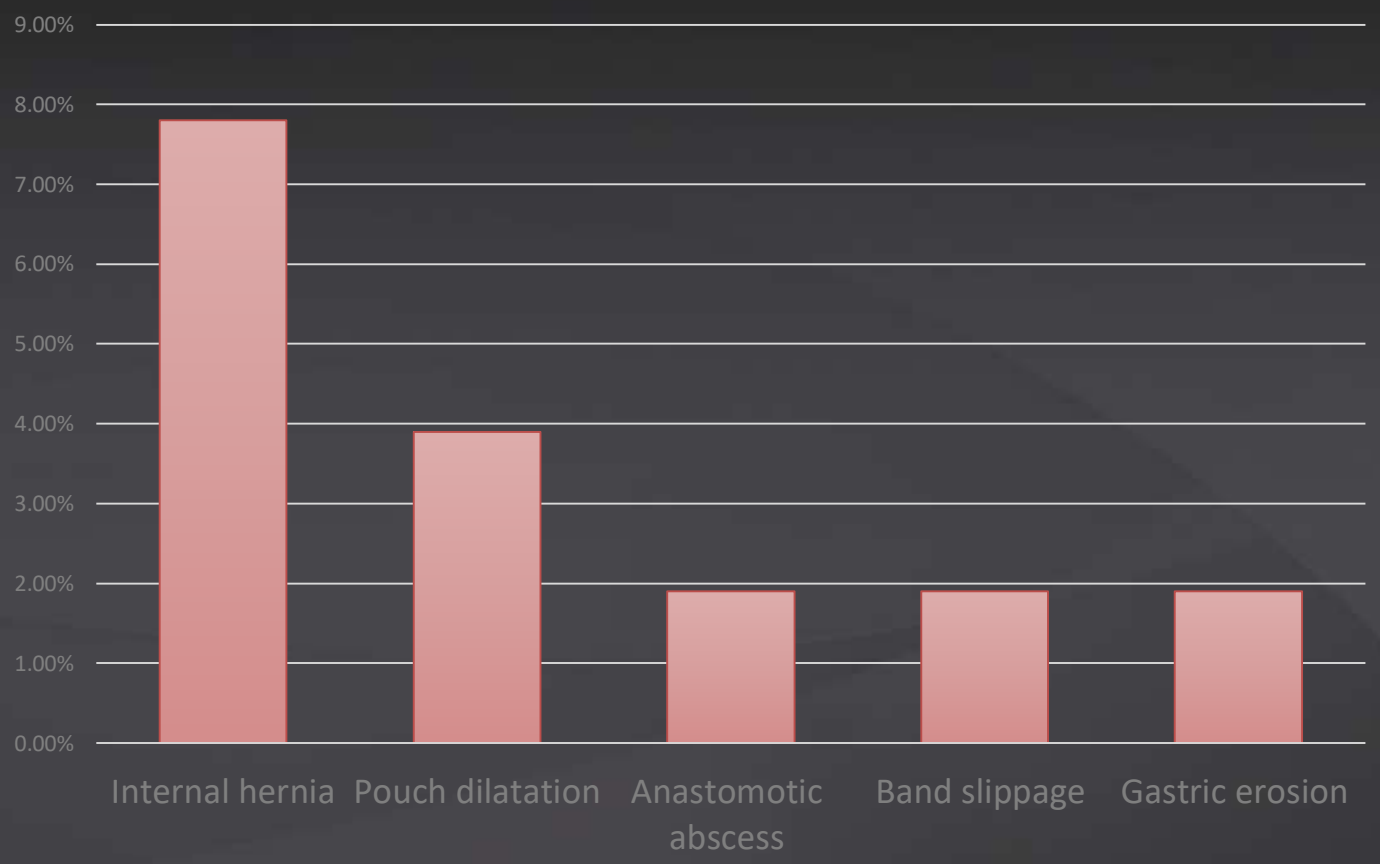
RESULTS

1. Anastomotic leak - 23.5%
2. Intussusception in 23.5%
3. Stricture - 19.6%
4. Small bowel obstruction - 19.6%
5. Splenic infarct - 17.6%

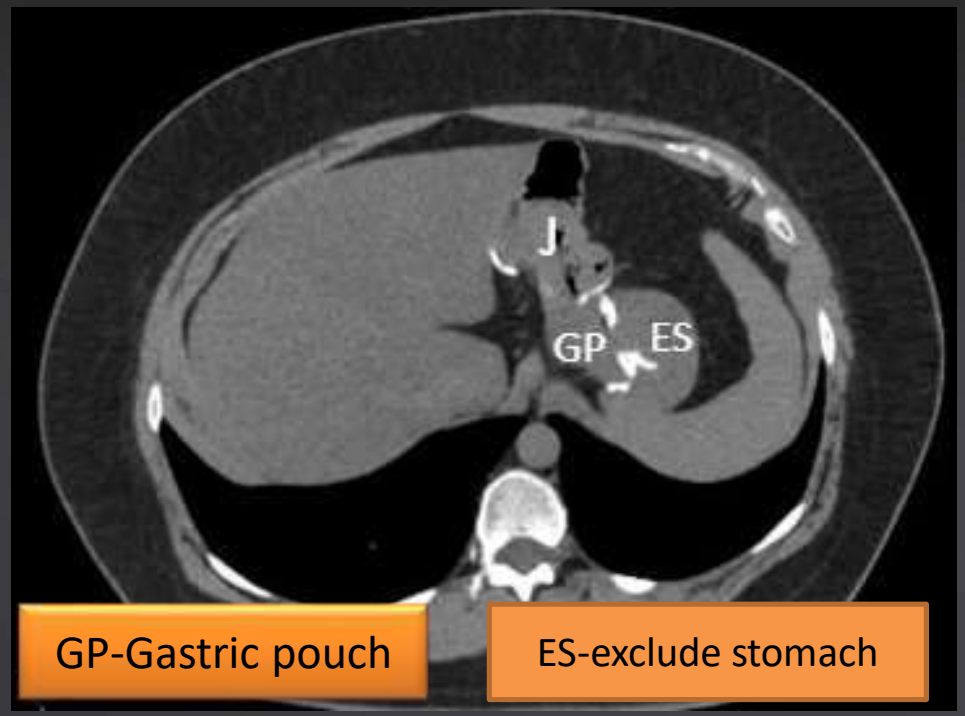


RESULTS

1. Internal hernia - 7.8%
2. Pouch dilatation - 3.9%
3. Anastomotic abscess - 1.9%
4. Band slippage - 1.9%
5. Gastric erosion - 1.9%

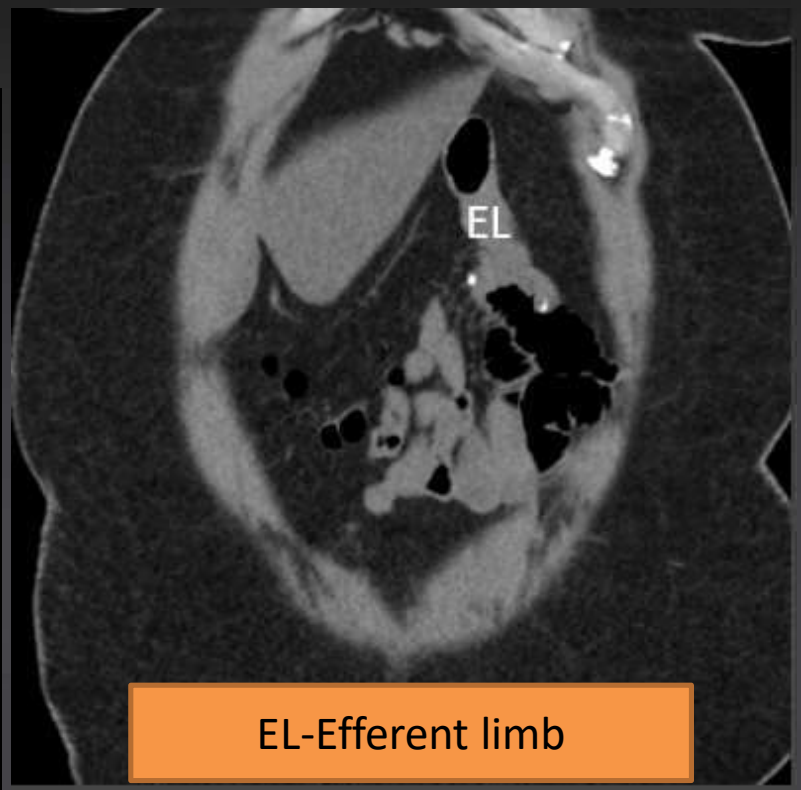


CT post-surgical anatomy of gastric bypass procedure



GP-Gastric pouch

ES-exclude stomach

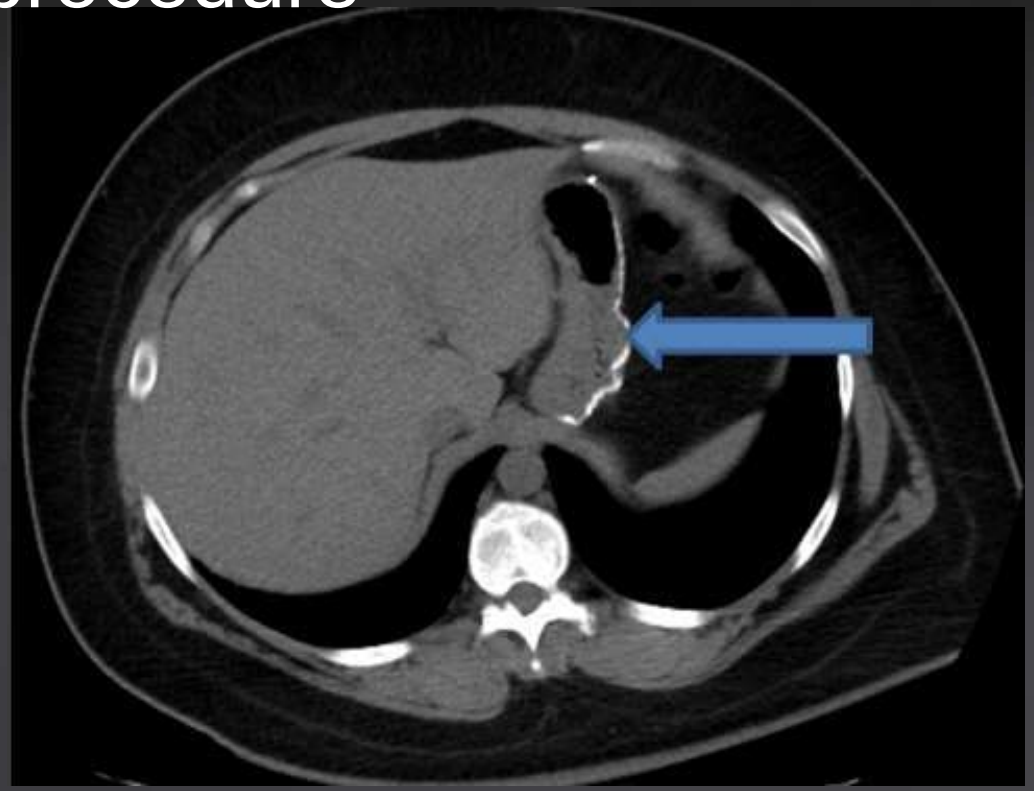


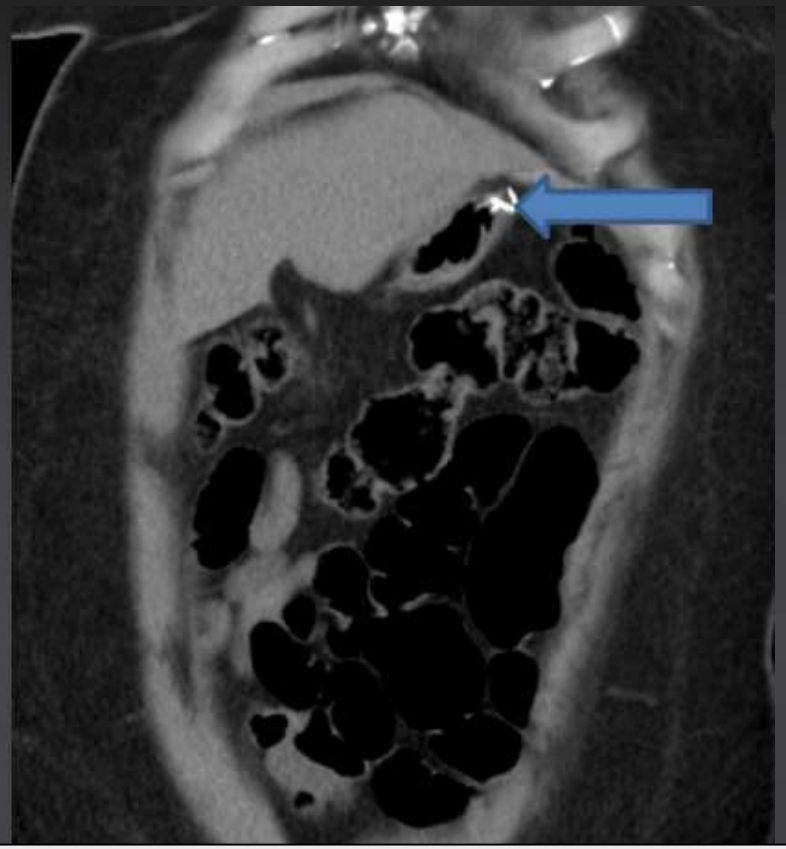
EL-Efferent limb

Jejuno-jejunostomy site

CT axial and coronal images shows- normal appearance of gastric bypass procedure

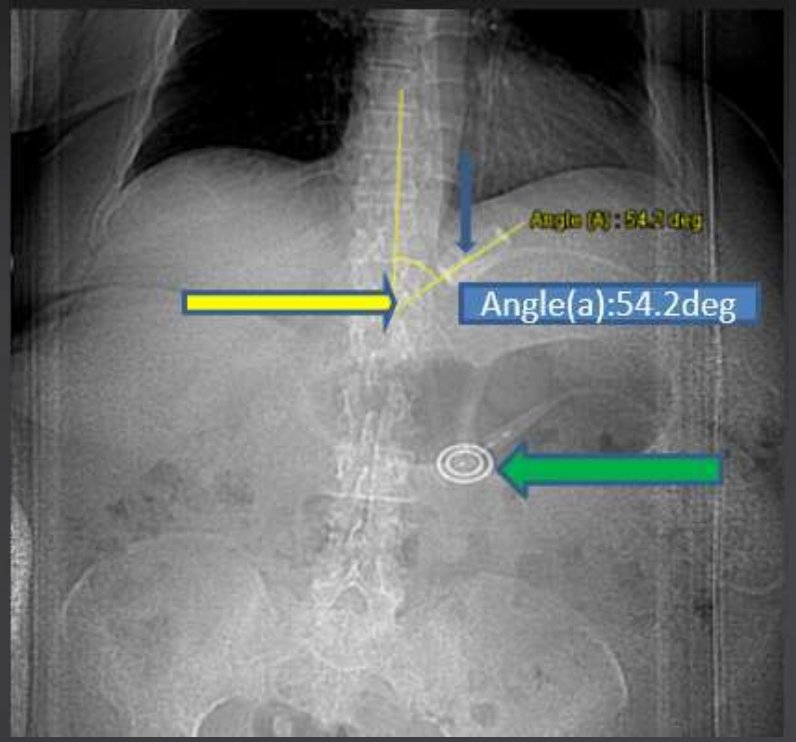
CT surgical anatomy of post sleeve gastrectomy procedure

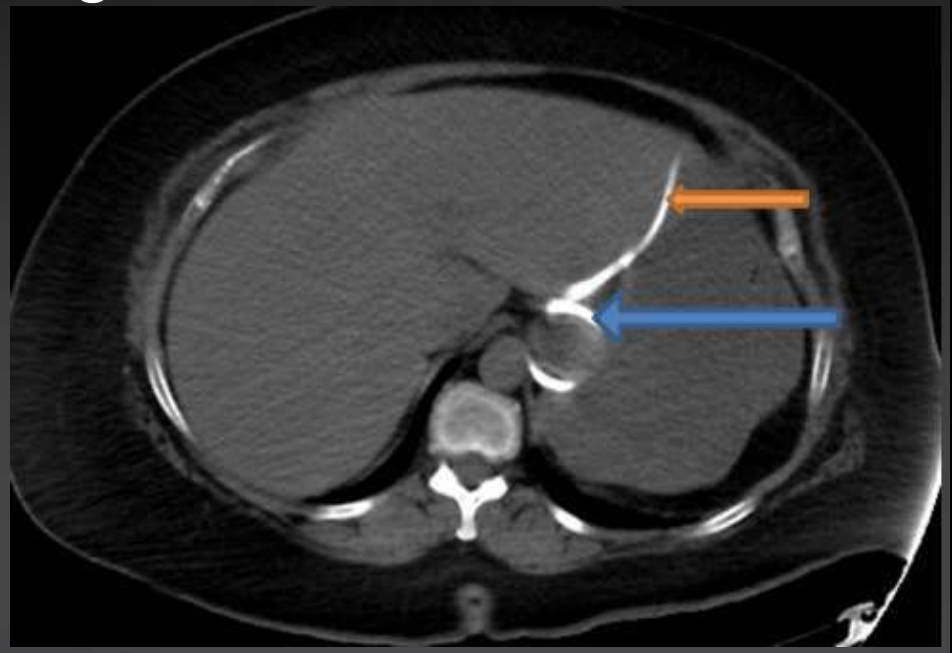


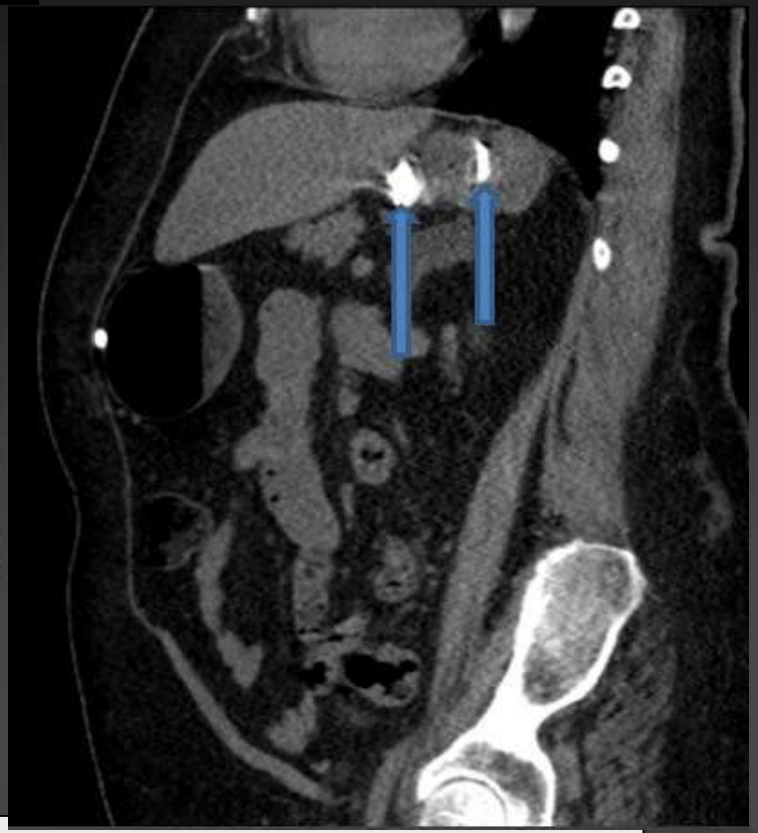


CT Axial and coronal images shows surgical suture line(arrow) along greater curvature with a small-caliber, tubular stomach after resection.

CT anatomy of post gastric banding

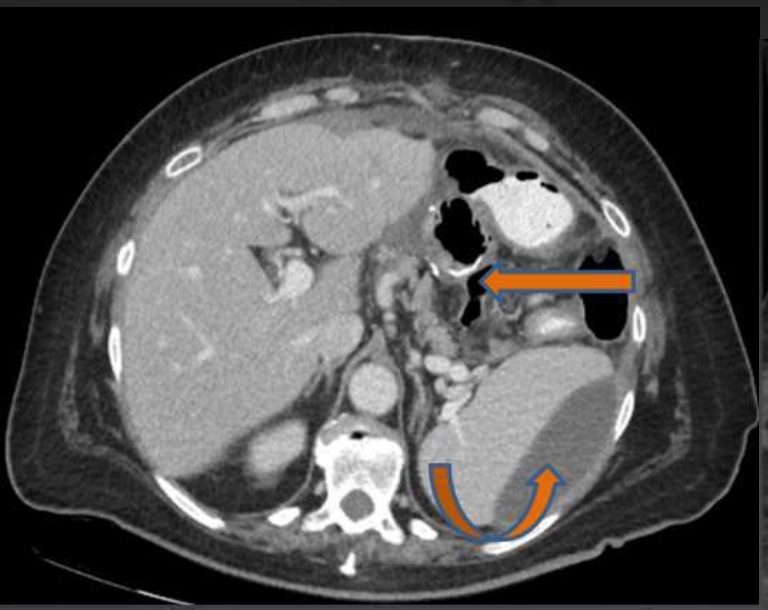


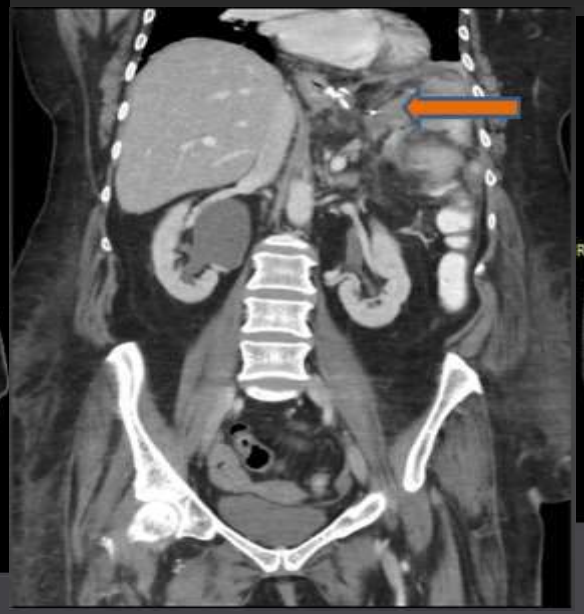




Scout , CT Axial and coronal images show shows lap band device (blue arrow) positioned around proximal stomach. The lap band is connected via tubing (yellow arrow) to an injectable subcutaneous port along anterior rectus sheath(green arrow). Yellow arrow shows Phi angle, angle formed by intersecting lines through the spinal column and horizontal axis of the band - normal range between 4° and 58°

Anastomotic Leak

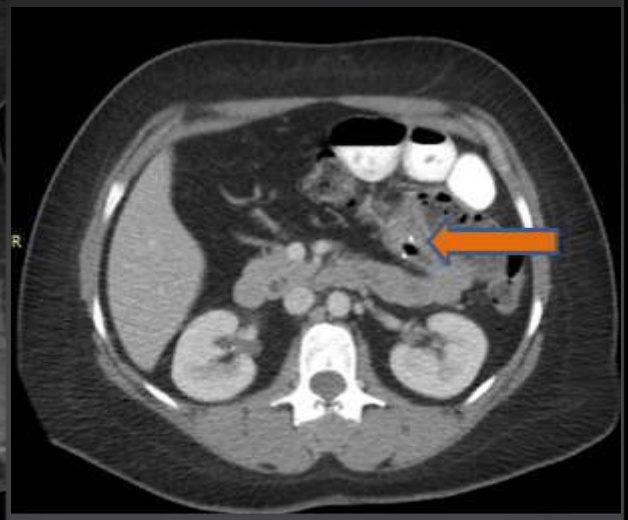




56 year female with epigastric pain , nausea and vomiting

Axial and coronal CT with oral and I.V contrast images after Roux-en-Y gastric bypass shows air loculi and free fluid at the anastomotic site(Straight arrows) indicating a leak. There is also peri splenic collection(Curved arrow)

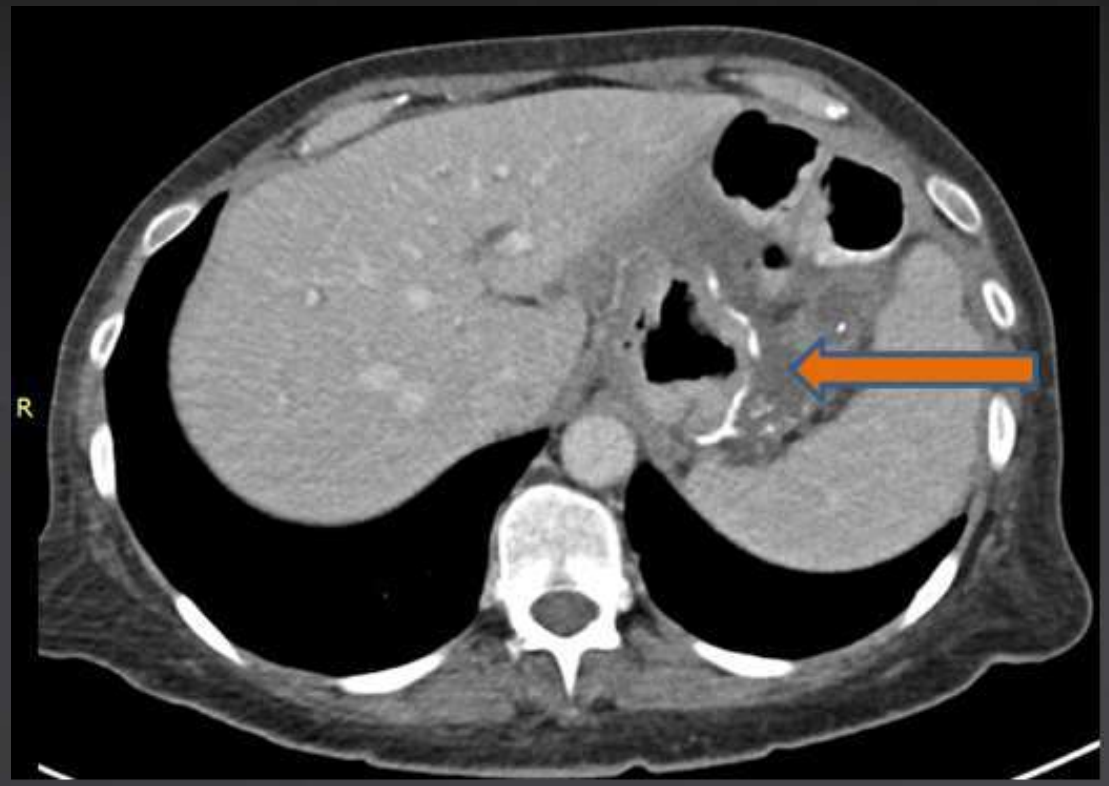
Anastomotic stricture



38 year male Upper abdominal pain, nausea, vomiting and diarrhoea

Axial and coronal with oral and I.V contrast images show stricture (Arrows) at jejuno-jenunal anastomosis after gastric bypass surgery

Anastomotic abscess

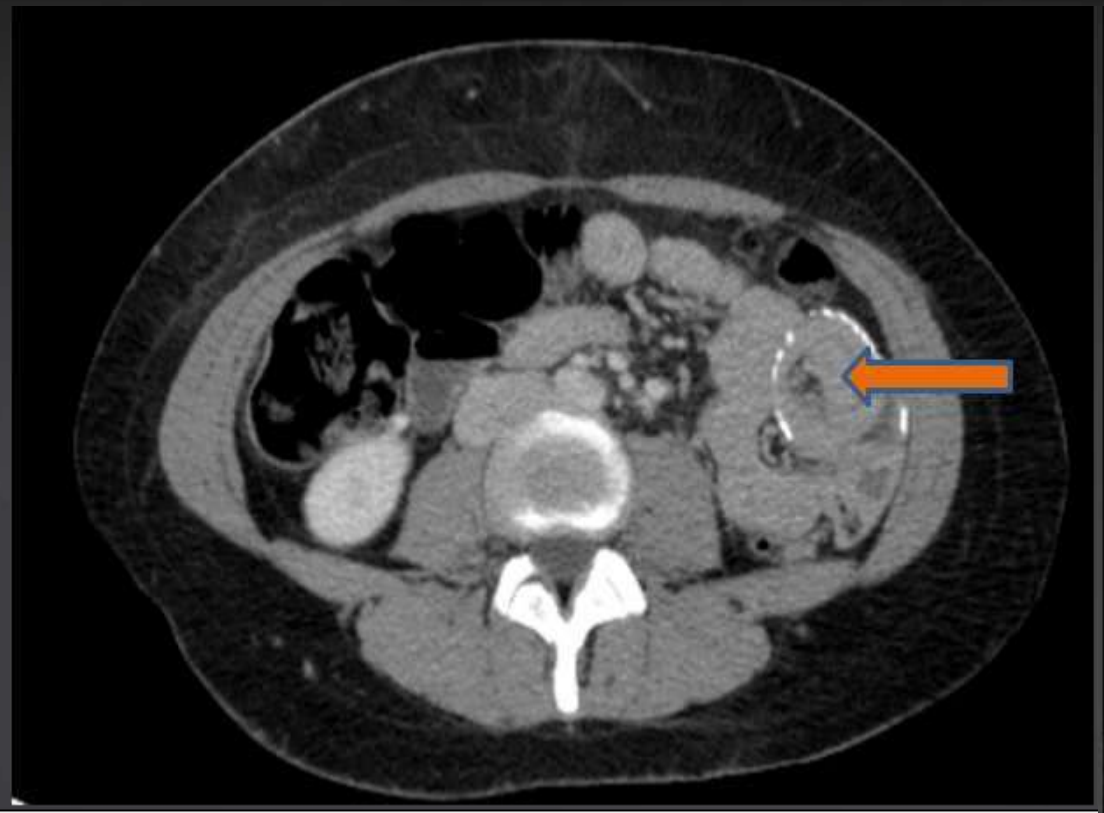


60 year female fever, nausea, vomiting and pain

Axial and coronal CT with I.V contrast images shows enhancing collection adjacent to the gastrojejunostomy anastomotic site indicating an abscess

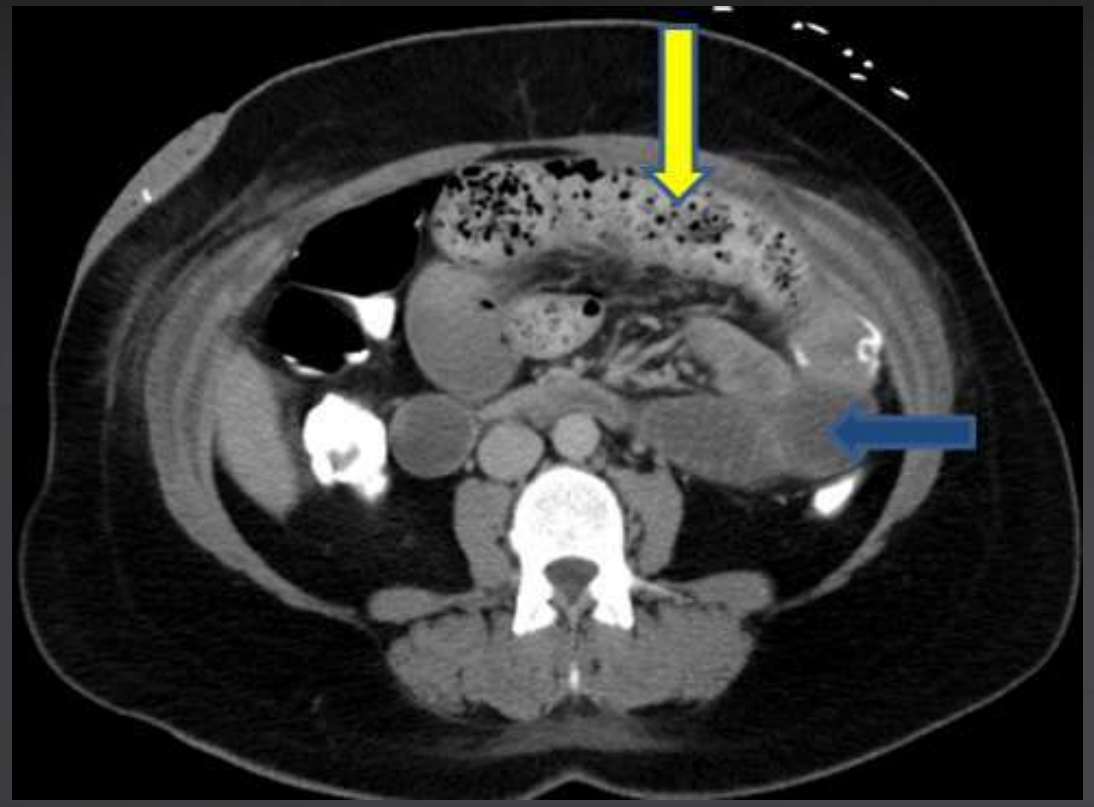
Intussusception

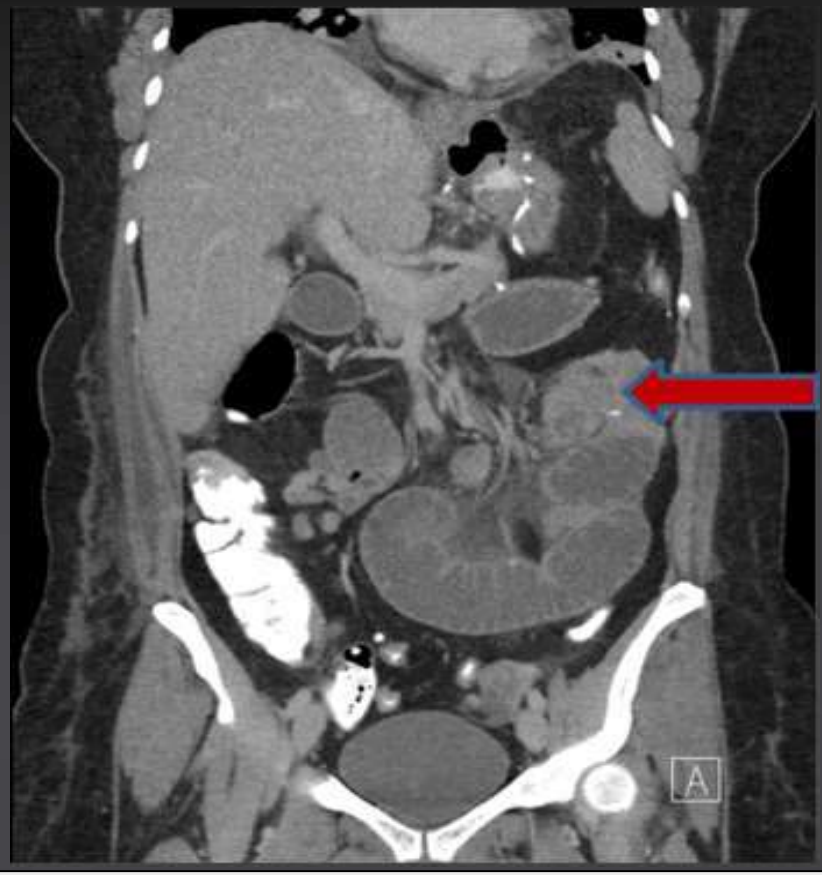
34 year female with abdomen pain and feels like something is stuck.



Axial and coronal CT with I.V contrast shows intussusception (arrow) with the afferent loop acting as an intussusceptum at the J–J anastomosis

Small bowel obstruction



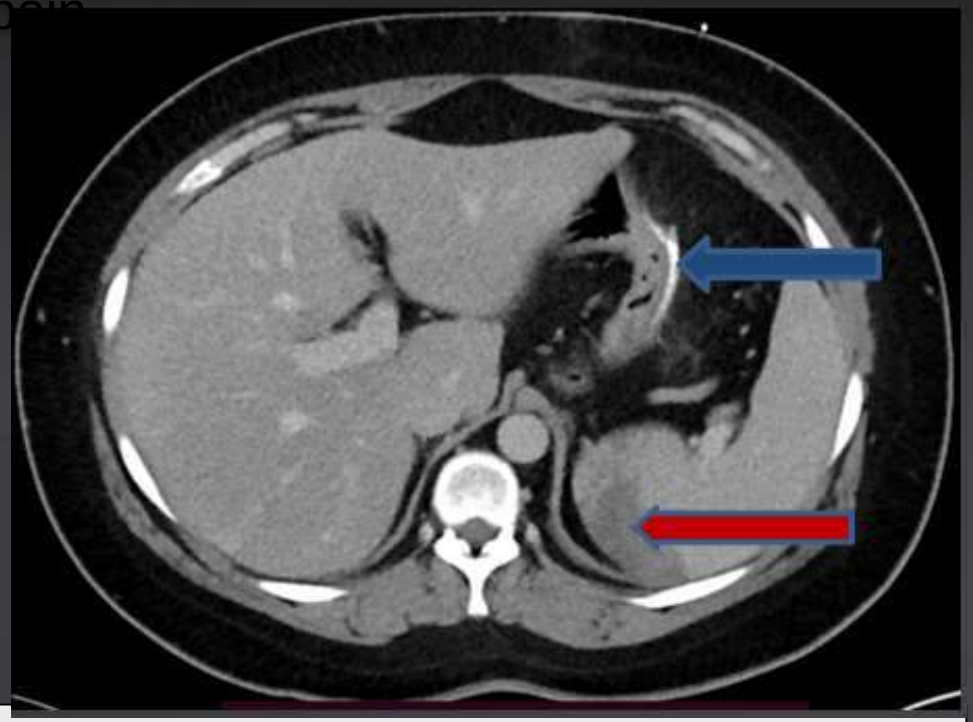


50 year female with diffuse abdomen pain non localized

Axial and coronal CT with I.V and oral contrast images shows multiple dilated jejunal bowel loops demonstrating air-fluid levels(Blue arrows) with transition in the region of enteroenteric anastomosis in the left mid abdomen(red arrow). Small bowel feces sign is noted (yellow arrow)

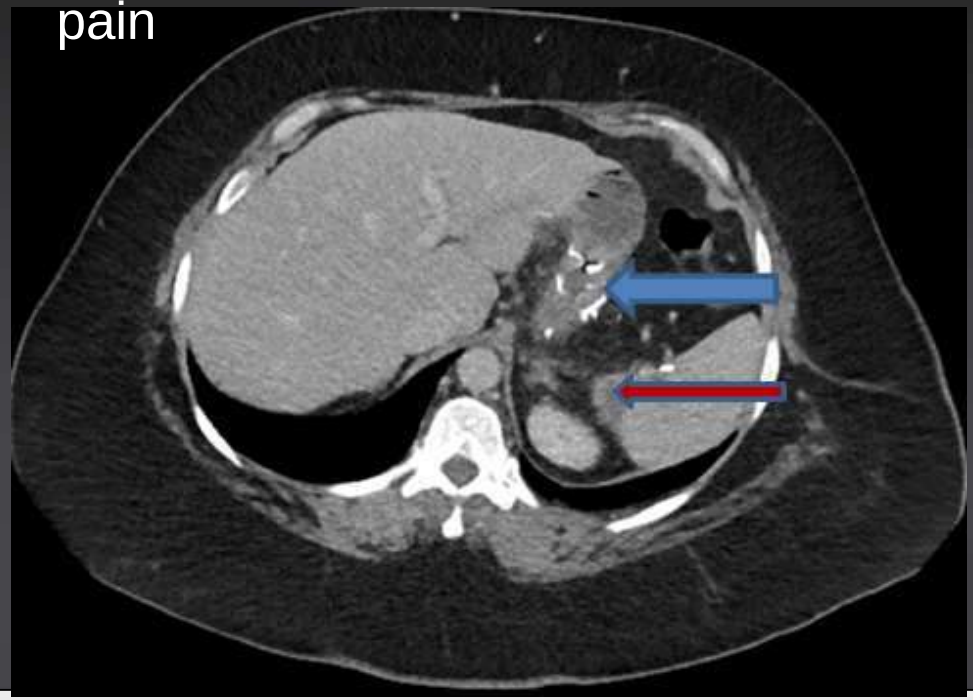
Splenic Infarct

42 year female with diffuse abdominal pain



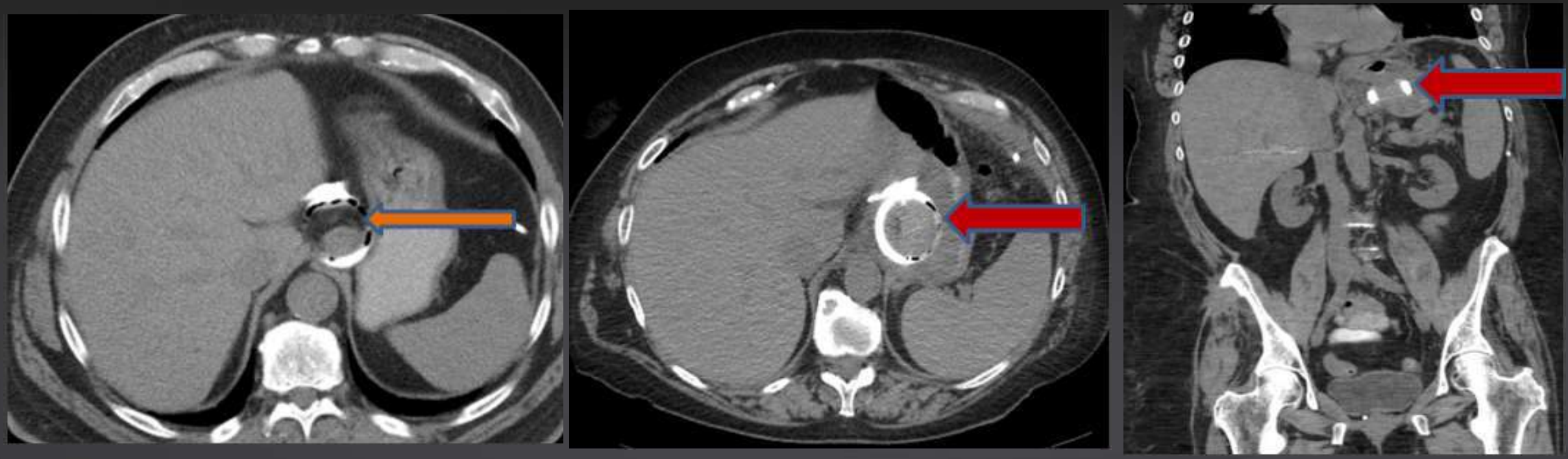
Axial CT with I.V contrast shows gastric sleeve surgery (blue arrow) changes with wedge-shaped focus of hypo-enhancement (red arrow) of splenic parenchyma represents an infarct.

52year female with abdominal pain



Axial CT with I.V contrast shows gastric bypass surgery (blue arrow) changes with wedge-shaped focus of hypo-enhancement (red arrow) of splenic parenchyma represents an infarct.

Gastric erosion after gastric banding



67 year female with abdomen pain

Axial and coronal CT without contrast images-
Image A- normal gastric banding position(arrow)
Image-B & C- Gastric band partially eroding into gastric lumen(arrow).

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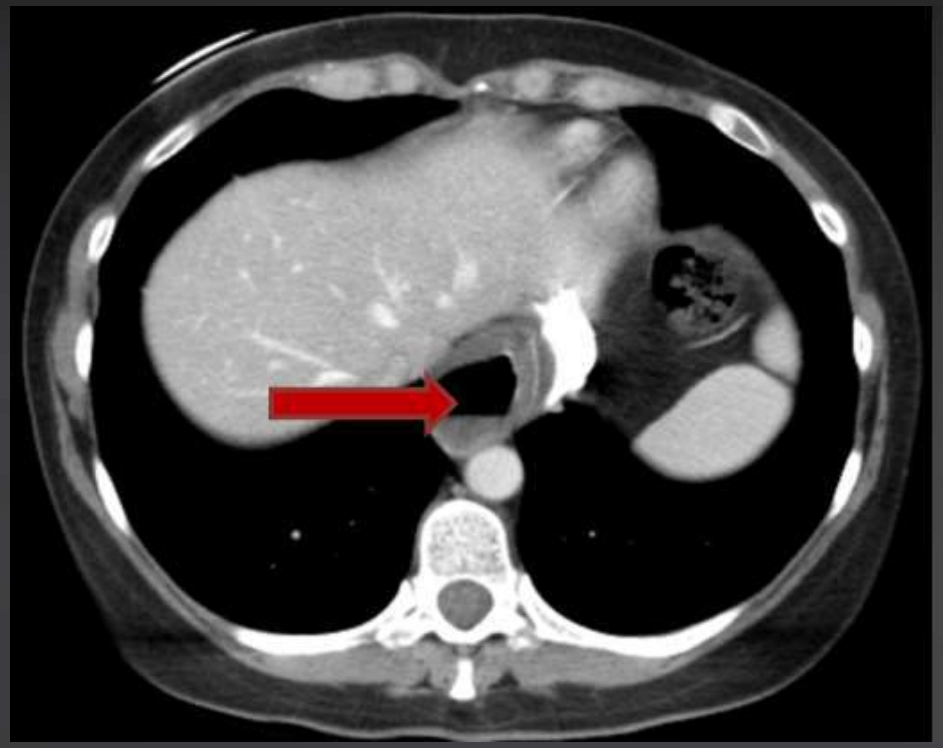
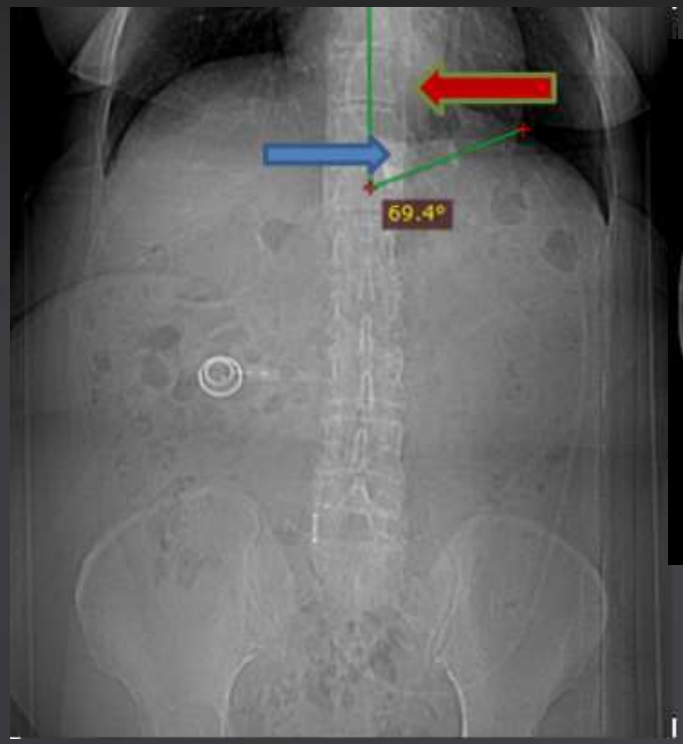
Gastric pouch dilatation

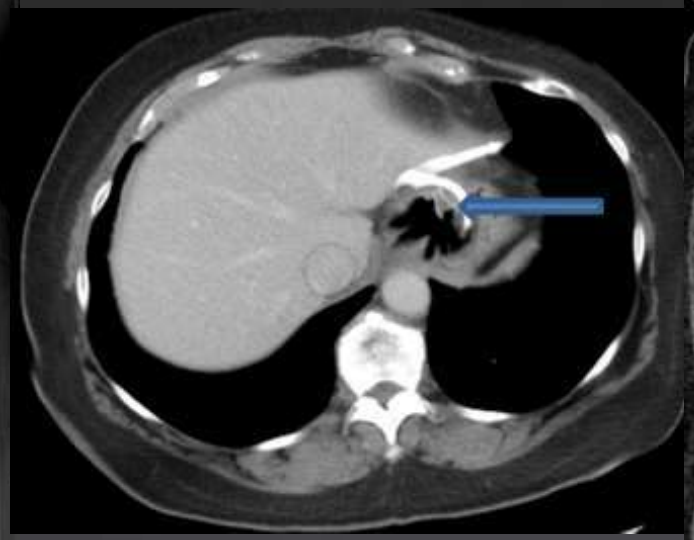


47 year female with vomiting - 4weeks and abdominal pain

Axial and coronal CT with I.V contrast images shows gastric pouch dilatation(arrows) after gastric banding(Blue arrow)

Gastric band slippage with gastric pouch dilatation





71 year female patient with abdominal pian and vomiting

Scout , CT Axial, coronal and sagittal with I.V contrast image shows increased phi angle(69.4), increased separation between the gastric band and the medial aspect of the left hemidiaphragm(scout image) and gastric pouch dilatation (red arrow)

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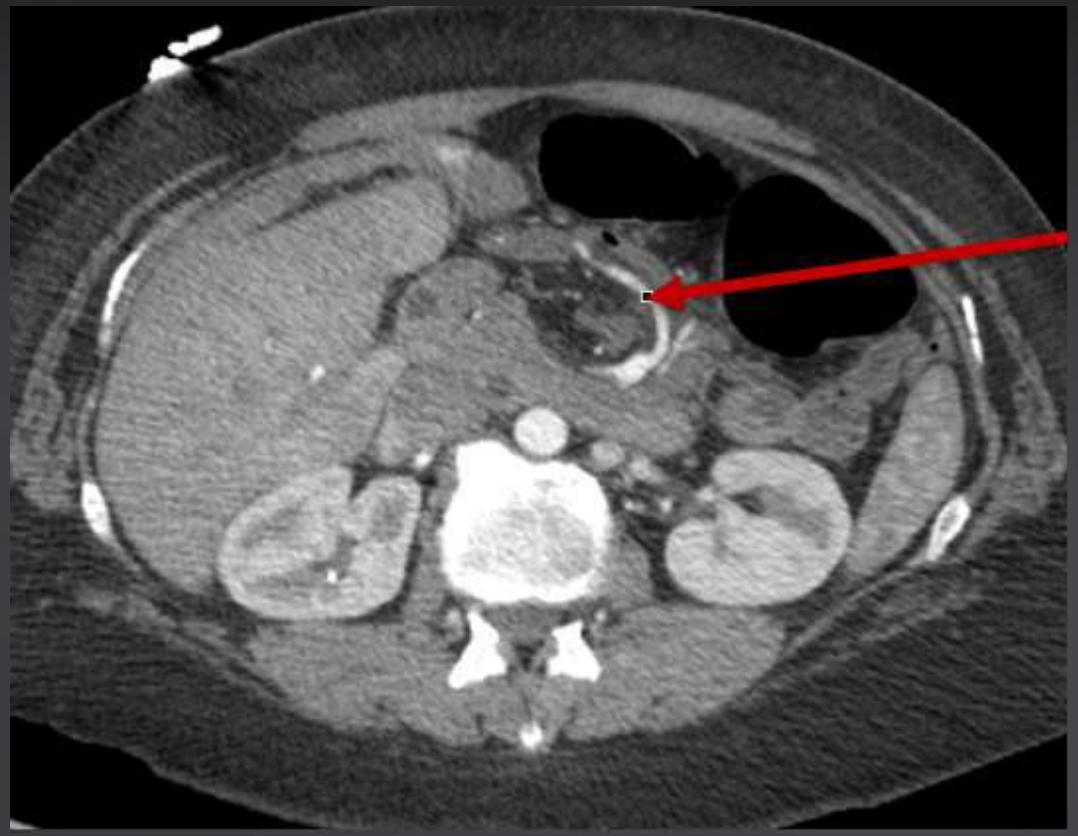
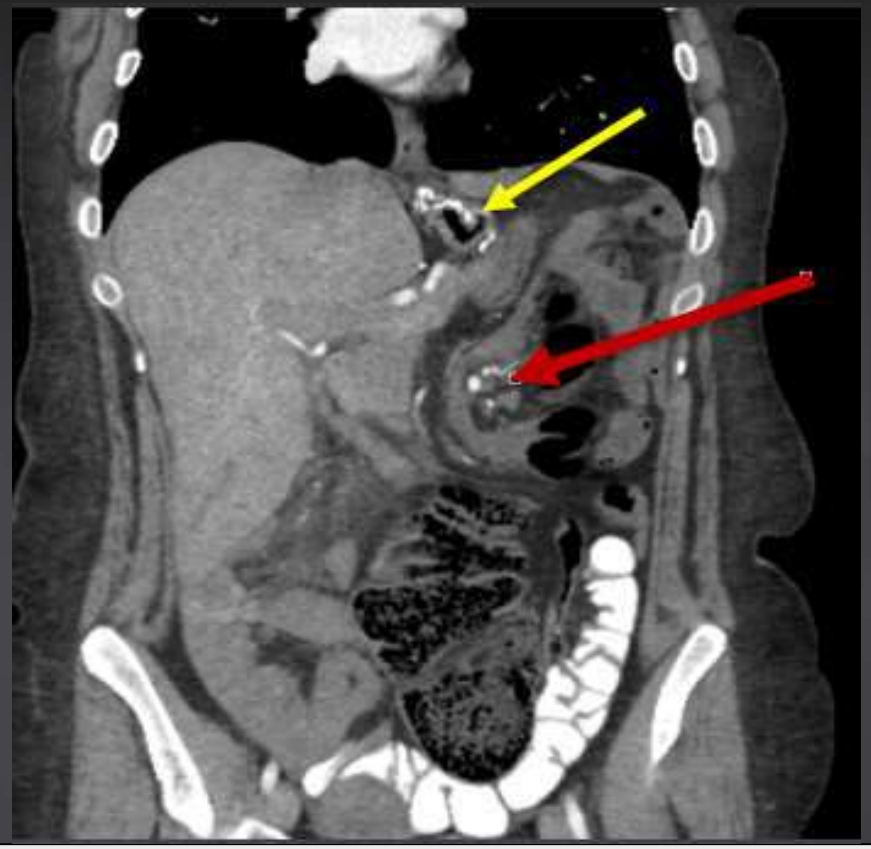
Internal hernia



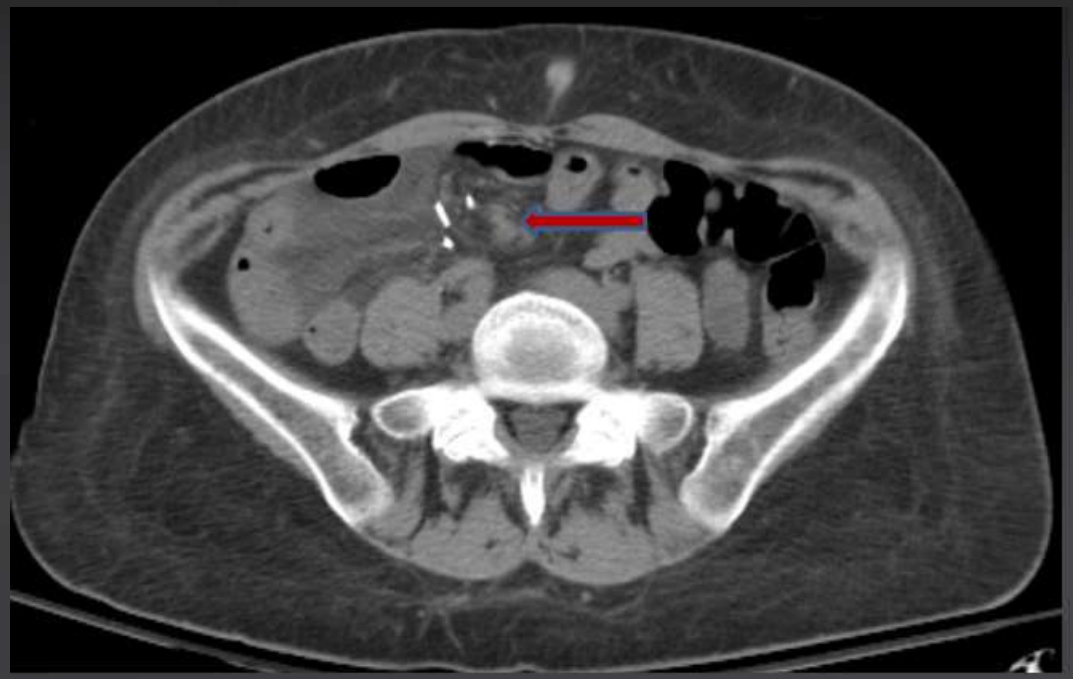


32 year female with peri-umbilical and epigastric tenderness.

Axial and coronal CT with oral and I.V contrast images shows Swirling of mesentery and mesenteric vessels(red arrows)-**Swirl sign** ,Gastric bypass surgery changes(yellow arrow)

Internal hernia

55 year old female with diffuse abdominal pain



CT axial and coronal images shows-**Hurricane eye sign** -Tubular distal mesenteric fat surrounded by small bowel loops(arrows)

Summary and teaching points:

- Clinical presentation of post bariatric procedure complications are non-specific.
- Accurate interpretation of CT Imaging characteristics is vital for timely diagnosis of post-operative complications.
- Teleradiology can facilitate early interpretation and appropriate management of such cases.

References

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THANK YOU