Afferent loop syndrome
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Section: Abdominal imaging
Area of Interest: Gastrointestinal tract
Procedure: Diagnostic procedure
Imaging Technique: CT
Special Focus: Obstruction / Occlusion Volvulus Case
Type: Clinical Cases
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Patient: 64 years, female

Clinical History:
A 64-year-old female patient presented to the emergency department with a recent history of progressively worsening abdominal pain, nausea and vomiting. Her medical history was positive only for Billroth II partial gastrectomy performed 5 years before for gastric adenocarcinoma. The physical examination revealed diffuse abdominal tenderness, and was otherwise unremarkable. Laboratory findings showed hyperamilasaemia and hyperamiasuria.

Imaging Findings:
Abdominopelvic contrast-enhanced computed tomography disclosed intra- and extra-hepatic biliary dilatation (black solid arrows), along with a massively dilated small bowel loop (white asterisks) distal to the surgical material in the right upper quadrant (black dotted arrow), up to the region of the gastrointestinal anastomosis, where the transition point had an abnormal twisted configuration (white dotted circle); a small amount of peritoneal free fluid was also noted (white arrowheads). Findings were consistent with acute high-grade afferent loop obstruction by volvulus. The patient underwent laparotomy in which partial enterectomy was performed due to irreversible ischaemia of the afferent loop. She had an uneventful recovery with no complications.

Discussion:
Afferent loop syndrome (ALS), a term first coined by Roux and co-workers in 1950, is an uncommon complication following construction of a Billroth II gastrojejunostomy. It occurs in approximately 0.3% of cases, and most are due to mechanical obstruction of the afferent loop [1-6]. Patients are thought to have an increased chance of developing obstruction if the jejunal portion of the afferent limb is longer than 30-40 cm in length, the gastrojejunostomy is placed in an antecolic instead of a retrocolic position, or if mesocolic defects are not properly closed after construction of a retrocolic anastomosis [2]. The back pressure from the dilated afferent loop, resulting from the accumulation of biliary, pancreatic and intestinal secretions, can lead to biliary and gallbladder dilatation, and acute pancreatitis [1-4].

Clinically, ALS is often difficult to diagnose because symptoms may be vague and nonspecific, and patients may present many years after the initial surgery. It manifests differently depending on whether the obstruction is acute, representing complete obstruction, or chronic, which is associated with partial obstruction. Patients with acute ALS
typically present with a sudden onset of epigastric and/or right or left upper quadrant abdominal pain, with associated nausea and non-bilious vomiting. The classic presentation of chronic ALS has been described as postprandial abdominal fullness and epigastric pain, with projectile bilious vomiting providing rapid relief of symptoms [1, 2, 4].

CT is the examination of choice to establish the diagnosis, depicting the obstructed segment and the underlying cause, and yielding information regarding the biliary tree, pancreas, and other structures. The dilated afferent limb typically appears as a large U-shaped fluid-filled tubular portion of small bowel crossing the mid-abdomen between the abdominal aorta and the superior mesenteric artery. The tubular nature of the dilated bowel combined with an appropriate anatomic distribution for the afferent limb is diagnostic. Complications such as a dilated gallbladder, biliary dilatation and pancreatitis are also readily identified at CT [1-5].

The treatment of ALS is surgery in order to relieve the obstruction and revise the anastomosis [1, 2, 4, 5]. Laparoscopic lysis of adhesions, when these are the underlying cause, may be attempted and can result in resolution of the ALS. Surgical correction may also be effected by deconstructing the Billroth II gastrojejunostomy and restoring gut continuity with an alternate method, the predominantly described operations being Billroth I gastroduodenostomy and Roux-en-Y gastrojejunostomy [2].

**Differential Diagnosis List:** Afferent loop syndrome, Mechanical obstruction is the underlying mechanism in most cases and it may be due to adhesions, kinking at the anastomosis, internal hernia, stomal stenosis, malignancy or inflammation surrounding the gastrojejunostomy, and enteroliths, bezoars or foreign bodies in the afferent limb or at the anastomosis., Uncommonly, afferent loop syndrome can be secondary to preferential gastric emptying into the afferent loop, Differentiation from a pancreatic pseudocyst may sometimes be difficult.

**Final Diagnosis:** Afferent loop syndrome

**References:**


Figure 1

Description: (See text - Imaging Findings). Origin: Department of Radiology, Hospitais da Universidade de Coimbra - Centro Hospitalar e Universitário de Coimbra, Coimbra, Portugal
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Description: (See text - Imaging Findings). Note that the dilated bowel loop crosses the mid-abdomen between the abdominal aorta and the superior mesenteric artery (red circle). Origin: Department of Radiology, Hospitais da Universidade de Coimbra - Centro Hospitalar e Universitário de Coimbra, Coimbra, Portugal
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