Lemmel syndrome, a rare cause of obstructive jaundice

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Section: Abdominal imaging
Area of Interest: Biliary Tract / Gallbladder
Procedure: Cholangiography
Imaging Technique: CT
Imaging Technique: MR
Special Focus: Acute Case Type: Clinical Cases
Authors: Tonolini Massimo, MD.
Patient: 89 years, male

Clinical History:

Mild jaundice, upper abdominal pain with epigastrial tenderness, negative Murphy's sign in an elderly male patient with multiple comorbidities including chronic obstructive lung disease and congestive heart failure, currently hospitalised with traumatic pelvic fractures.
Raised total (7.5 mg/dL) and direct (5.8 mg/dL) bilirubin, lipase (2200 U/l), C-reactive protein (20).

Imaging Findings:

Previous ultrasound reports dating two months before described gallbladder lithiasis and sludge, non-dilated intrahepatic and common bile (CBD) ducts.
Contrast-enhanced CT requested to investigate clinical and laboratory suspicion of mild acute pancreatitis image showed distended gallbladder, moderately dilated CBD (12 mm) and intrahepatic bile ducts, peripancreatic oedema and fluid effusion. Additionally, a fair-sized (2.5 cm) fluid-filled duodenal diverticulum located between the second duodenal portion and the intrapancreatic choledochus was identified along with its narrow orifice. During hospitalisation, total bilirubin fluctuated in the range 5-9 mg/dL.
Endoscopic Retrograde Cholangiopancreatography (ERCP) failed because of impossible cannulation of duodenal papilla, located just adjacent to the diverticulum. Some days later, limited-protocol MRI with MRCP sequences performed with uncooperative, dyspnoeic patient confirmed duodenal diverticulum abutting the choledochus, extrinsically compressing the adjacent CBD, moderately dilated excluding intraluminal stones.
Considering comorbidities, further endoscopic and surgical procedures were deemed contraindicated. Clinical worsening with septic cholangitis led to exitus.

Discussion:

Not uncommon in elderly patients, duodenal diverticula (DD) usually remain asymptomatic and may be incidentally found during cross-sectional imaging studies. In rare (10%) cases complications requiring intervention develop, including perforation, severe pain, biliary and/or pancreatic obstruction, gastroduodenal obstruction and cholecystoduodenal fistula in decreasing order of frequency. Furthermore, collapsed DD may result in diagnostic uncertainty with possible misinterpretation as a pancreatic head tumour. Considering advanced age and comorbidities of most patients, significant postoperative morbidity and mortality, surgery is reserved for emergent presentations or intractable symptoms [1-3].
Initially described in 1934, Lemmel's syndrome (LS) represents an uncommon, probably underreported cause of obstructive jaundice, most often occurring in elderly patients and caused by a periampullary DD compressing the
distal common bile duct (CBD) preventing the bile and/or pancreatic secretion [3-5]. Often intermittent, jaundice is characteristically exacerbated by eating and improved by fasting. Variable associated symptoms include pruritus, urine and stools alterations, abdominal pain, fullness, regurgitation, malaise and weight loss [3, 4]. Ultrasound and CT imaging disclose fair-sized (mean 1.7 cm), sometimes large diverticula near the ampulla of Vater, with variable fluid, air or food content, closely in contact and extrinsically compressing the CBD with upstream dilatation. DD may be located ventrally (type I) or dorsally (type II) to the Vater complex. Gallstones and mild oedematous pancreatitis changes are frequently associated [3-6]. Importantly, sometimes endoscopy may fail to detect DD when the duodenal orifice cannot be identified [3]. In the past, ERCP was the preferred diagnostic modality: sometimes found incidentally, DD may cause technical difficulties in CBD cannulation [5, 7]. Conversely, non-invasive MRCP may easily detect DD, visualise common bile duct compression and upstream biliary dilatation, exclude other intrinsic or intraluminal causes such as coledocholithiasis and solid tumour [3, 4].

In conclusion, LS should be remembered as a possible cause of obstructive jaundice in elderly patients, avoiding misinterpretation as malignancy. Treatment is conservative, whereas endoscopic lavage or surgical excision (diverticulectomy) should be reserved for intractable or complicated situations and cannot prevent recurrence [3].

**Differential Diagnosis List:** Duodenal diverticulum causing obstructive jaundice (Lemmel's syndrome), Bile duct carcinoma, Ampullary carcinoma, Pancreatic head carcinoma, Acute pancreatitis, Cholangitis, Biliary ileus, Chronic pancreatitis

**Final Diagnosis:** Duodenal diverticulum causing obstructive jaundice (Lemmel's syndrome)

**References:**


**Figure 1**

**a**

*Description:* Contrast-enhanced CT image show distended gallbladder, moderate dilatation (12 mm) of the common bile duct, mild peripancreatic oedema and fluid effusion. *Origin:* Tonolini M, Radiology Department, "Luigi Sacco" University Hospital, Milano (Italy)

**b**

*Description:* Contrast-enhanced CT images show fair-sized (2.5 cm) duodenal diverticulum (arrowheads) located between the 2nd duodenal portion and the intrapancreatic choledochus. *Origin:* Tonolini M, Radiology Department, "Luigi Sacco" University Hospital, Milano (Italy)
Description: Contrast-enhanced CT images show fair-sized (2.5 cm) duodenal diverticulum (arrowheads) located between the 2nd duodenal portion and the intrapancreatic choledochus. Origin: Tonolini M, Radiology Department, "Luigi Sacco" University Hospital, Milano (Italy)

Description: Coronal reformations visualise narrow communication between the gas-fluid filled diverticulum and the duodenal lumen (arrowhead). Origin: Tonolini M, Radiology Department, "Luigi Sacco" University Hospital, Milano (Italy)
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Figure 2

**a**

Description: Axial T2- (a) and T1-weighted (b) images confirm duodenal diverticulum abutting the choledochus, with air-fluid level. Origin: Tonolini M, Radiology Department, "Luigi Sacco" University Hospital, Milano (Italy)

**b**

Description: Axial T2- (a) and T1-weighted (b) images confirm duodenal diverticulum abutting the choledochus, with air-fluid level. Origin: Tonolini M, Radiology Department, "Luigi Sacco" University Hospital, Milano (Italy)
Description: Thick-slab (c) and MIP-reformatted thin-slab (d) MRCP images confirm duodenal diverticulum extrinsically compressing the adjacent common bile duct, moderately dilated without intraluminal stones. Origin: Tonolini M, Radiology Department, "Luigi Sacco," University Hospital, Milano (Italy)
**Description:** Thick-slab (c) and MIP-reformatted thin-slab (d) MRCP images confirm duodenal diverticulum extrinsically compressing the adjacent common bile duct, moderately dilated without intraluminal stones. **Origin:** Tonolini M, Radiology Department, "Luigi Sacco" University Hospital, Milano (Italy)