Case 10051

Eurorad

Gastric pneumatosis

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ISSN: 1563-4086
Section: Abdominal imaging
Area of Interest: Abdomen
Procedure: Diagnostic procedure
Procedure: Contrast agent-oral
Procedure: Computer Applications-Detection, diagnosis
Imaging Technique: Conventional radiography
Imaging Technique: CT
Imaging Technique: Image manipulation / Reconstruction
Special Focus: Inflammation Biological effects Acute Neoplasia Case Type: Clinical Cases
Authors: La Pietra P, Sommario M, Marchini N, Bovo L
Patient: 52 years, male

Clinical History:

A 42-year-old man was admitted to E.R. for postprandial abdominal pain, bloating nausea, vomiting.
He had a prior history of frequently epigastric pain for about 5 months. He underwent gastroscopy a few days before. Clinical examination showed abdominal distension with mild tenderness without rigidity. The rest of the examination was unremarkable.

Imaging Findings:

The plain abdominal film showed a significant gastric dilatation and a subtle arcuate line of radiolucency, parallel to great curvature of the stomach.
Dilatation of bowel loops and air-fluid levels were not present.
For excluding pneumoperitoneum, a CT examination was performed, which showed: multiple bubble air within the wall of the stomach and a lesser distension of the stomach.
This radiologic finding can indicate a potentially lethal process; however, clinical features and the improvement of symptoms after placement of the nasogastric tube are not suggestive of a life-threatening condition.
Pending the result of gastric biopsy, the surgeon has decided to defer enhanced CT. The result of biopsy was positive for cancerisation of gastric ulcer.
Preoperative CT staging showed a wall thickening with stricture of the antrum of stomach.
The patient underwent surgery with partial gastrectomy.

Discussion:

Pneumatosis is a descriptive term that indicates the presence of gas within the intestinal wall [1]; this condition is very rare and can occur in any part of the gut. [2-3]. The gastric pneumatosis (GP) is the less frequent, its incidence is of 9% of all pneumatoses [4].
First described in 1889 by Fraenkel, it can affect both adults and children; both sexes are affected and it is most frequent after the age of 40. The pathogenesis is unclear; several explanations have been proposed:
The presence of gas within gastric wall is probably due to elevated intraluminal pressure or by mucosal injury that allows penetration to intraluminal gas. Penetration in the intestinal wall of gas producing microorganisms. The gas reaches the gastric wall from extra-gastric sources by sectioning the interstitial planes [3-4].
Numerous aetiologies of GP have been described in the literature. In children it is frequently associated to pyloric

stenosis, gastric malrotation, anular pancreas and not correct positioning of feeding catheters. In adulthood, frequently it is due to iatrogenic injury during endoscopy or gastric outlet obstruction; much less often intestinal ischaemia or infarction. More rare causes are gastric infection or caustic ingestion.
Clinical presentation is variable; the symptoms are not due to GP, but to underlying pathologic processes [3-4]. Based on aetiology, clinical presentation and prognosis GP can be categorised under two headings 1. Gastric emphysema can be a benign self-limiting condition following a gastric endoscopy, usually asymptomatic. More rarely it is due to gastric outlet obstruction for chronic peptic ulcer, cancer of stomach, duodenum or pancreas [4]. In these cases the symptoms (abdominal pain, nausea, vomiting) are due to gastric dilatation. 2. Emphysematous gastritis is a very rare but grave variant caused by local infection by gas-forming microorganisms. Patients usually present severe abdominal pain, nausea, vomiting, haematemesis, fever, tachycardia and septic shock.
The diagnosis of GP is usually made by abdominal radiography or CT examination. CT is more sensitive in detecting the GP, evaluating the entire abdominal cavity can help to acknowledge the underlying pathologic process [2, 3, 4]. Although a linear radiolucency is usually bound to gastric emphysema and the thickening of the gastric wall with mottled gas bubbles is associated to emphysematous gastritis; these radiologic features are not specific enough to distinguish between a relatively benign disease and a condition of life-threatening [4]
Treatment options depend on the underlying pathology.
In many cases, conservative treatment is sufficient for [4] life support, antibiotic therapy or surgery may be necessary in other cases.
Differential Diagnosis List: Gastric pneumatosis due to gastric outlet obstruction, Pneumoperitoneum, Gastric emphysema, Emphysematous gastritis

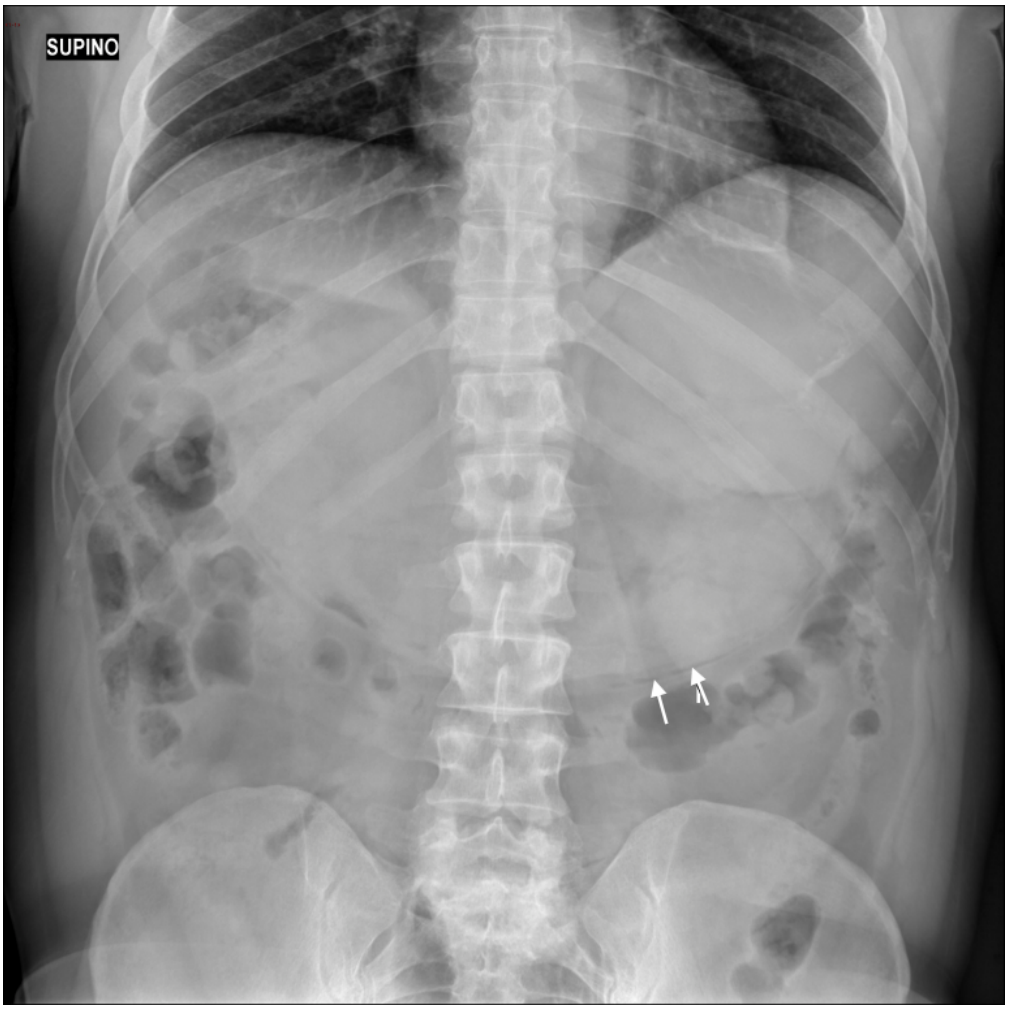
Final Diagnosis: Gastric pneumatosis due to gastric outlet obstruction

References:

Ho LM, Paulson EK, Thompson WM (2007) Pneumatosis Intestinalis in the Adult:Benign to Life-Threatening Causes. AJR Am J Roentgenol Jun; 188(6): 1604–13. (PMID: 17515383)
Donovan S, Cernigliaro J, Dawson N. (2010) Pneumatosis intestinalis: a case report and approach to management. Case Report Med. 2011 2011:571387 (PMID: 21331331)
Soyer P, Martin-Grivaud S, Boudiaf M, Malzy P, Duchat F, Hamzi L, Pocard M, Vahedi K, Rymer R. (2008) Linear or bubbly: a pictorial review of CT features of intestinal pneumatosis in adults. J Radiol Dec;89(12):1907-20. (PMID: 19106848)
Johnson PT, Horton KM, Edil BH, Fishman EK, Scott WW. (2011) Gastric pneumatosis: the role of CT in diagnosis and patient management. Emerg Radiol Jan;18(1):65-73. (PMID: 20652346)

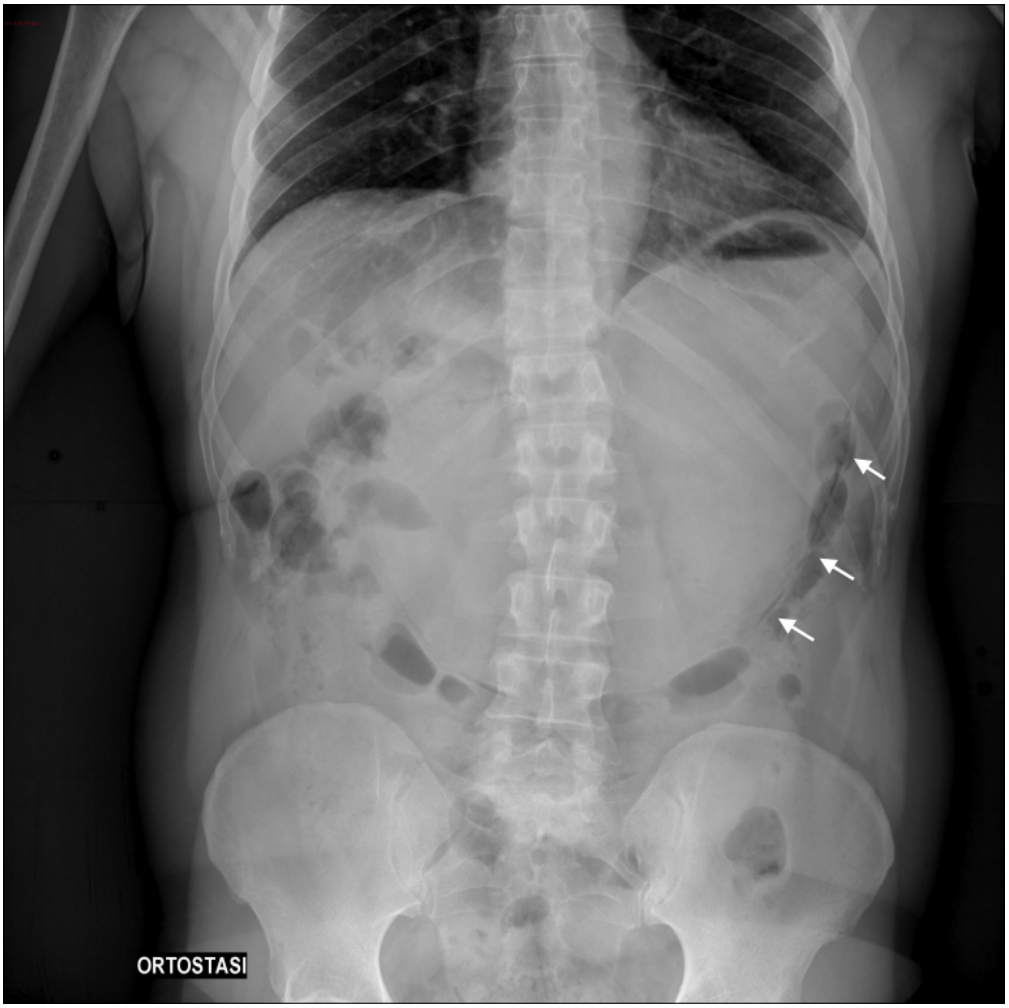
Figure 1

a



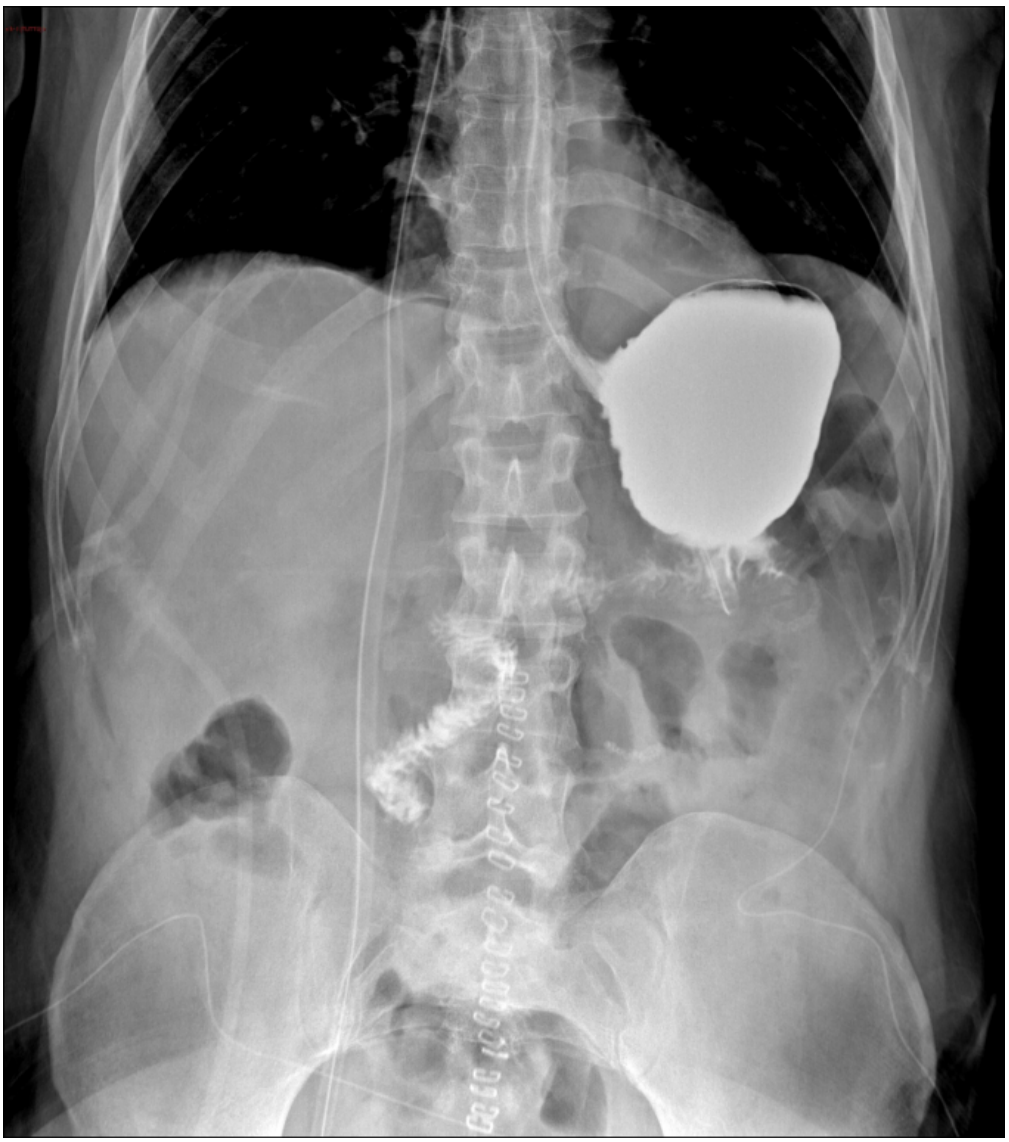
Description: Plain abdominal film (supine view) show a gastric dilatation and an subtile arcuate line of radiolucency, parallel to great curvature of the stomach (arrows). **Origin:** U.O.C Radiologia Area Nord Asl Bologna

b



Description: Plain abdominal film (erect view) better show the subtile arcuate line of radiolucency, parallel to great curvature of the stomach (arrows). **Origin:** U.O.C Radiologia Area Nord Asl Bologna

c



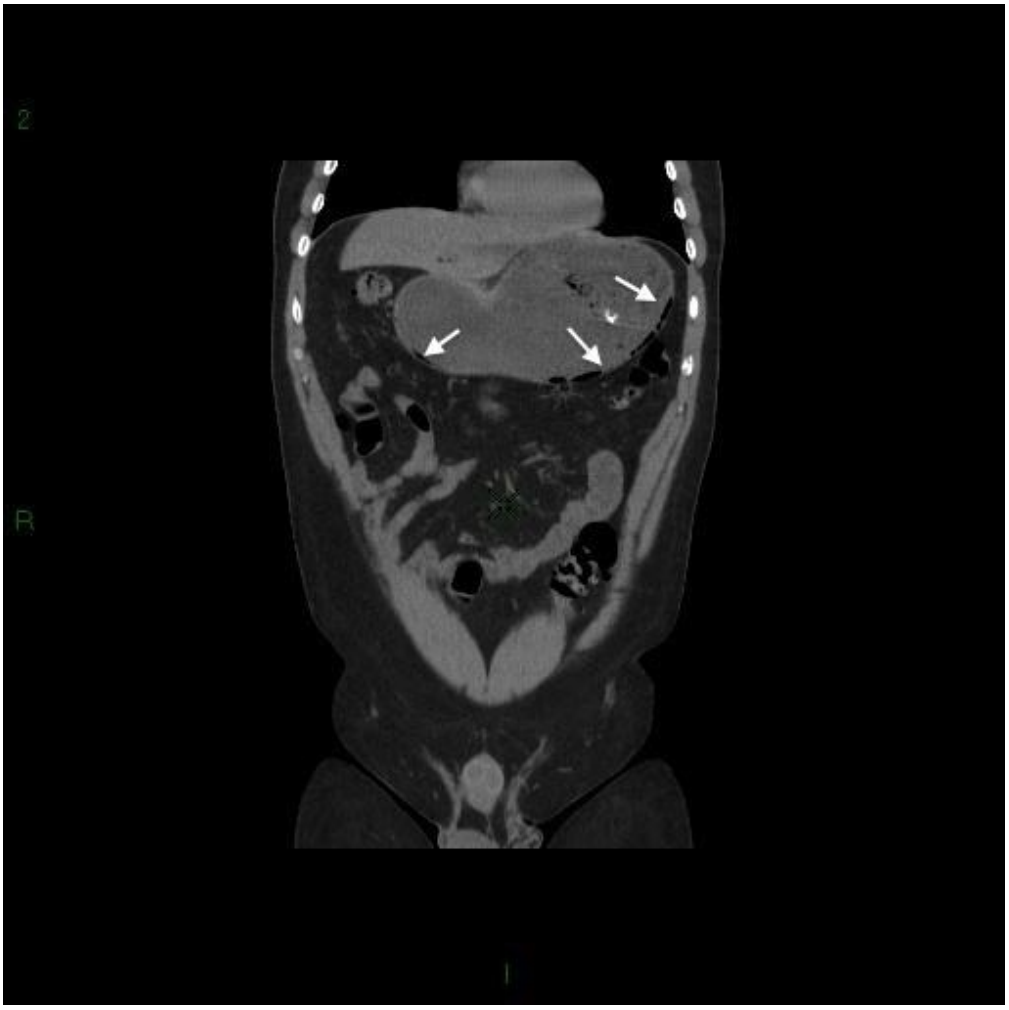
Description: A gastrografin meal shows: post gastrectomy surgical changes. **Origin:** U.O.C Radiologia Area Nord Asl Bologna

Figure 2

a

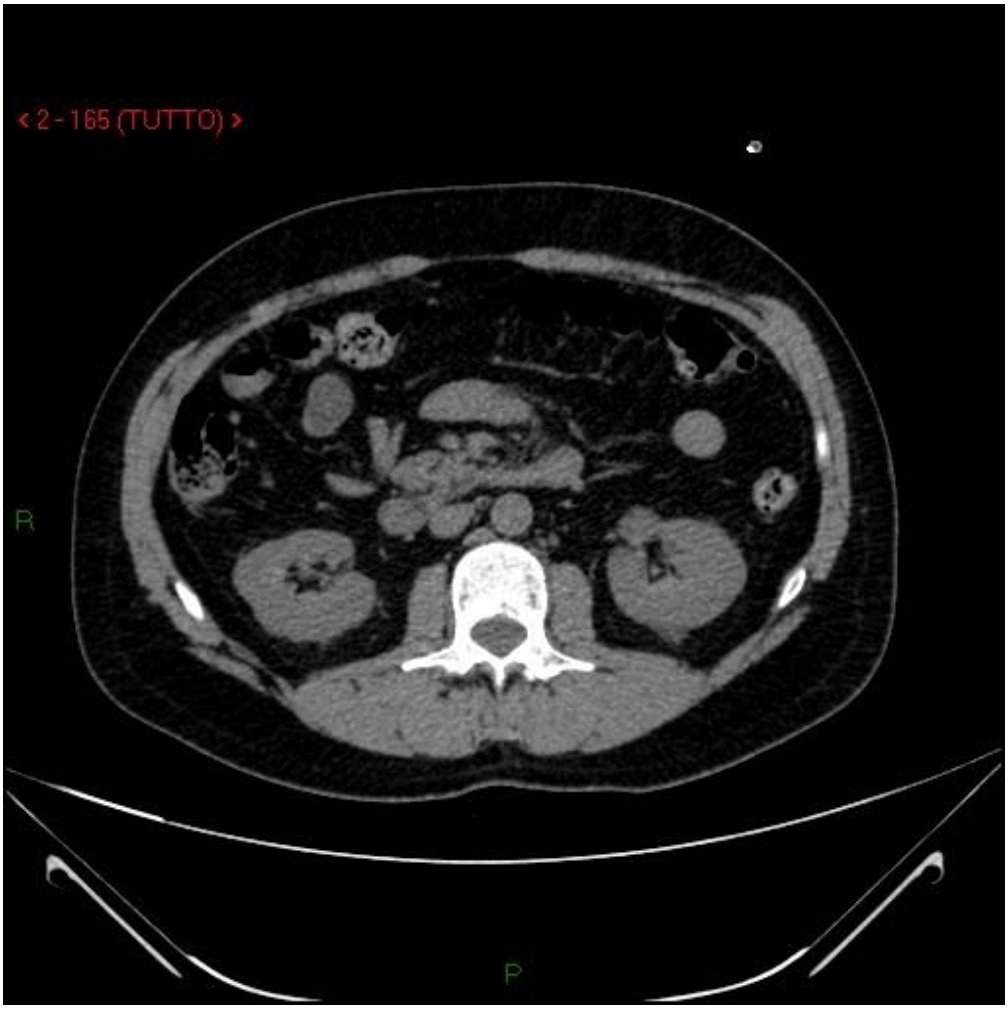
Description: Axial unenhanced CT image shows: distension of the stomach and multiple bubble air within the wall of the stomach. **Origin:** U.O.C Radiologia Area Nord Asl Bologna

b



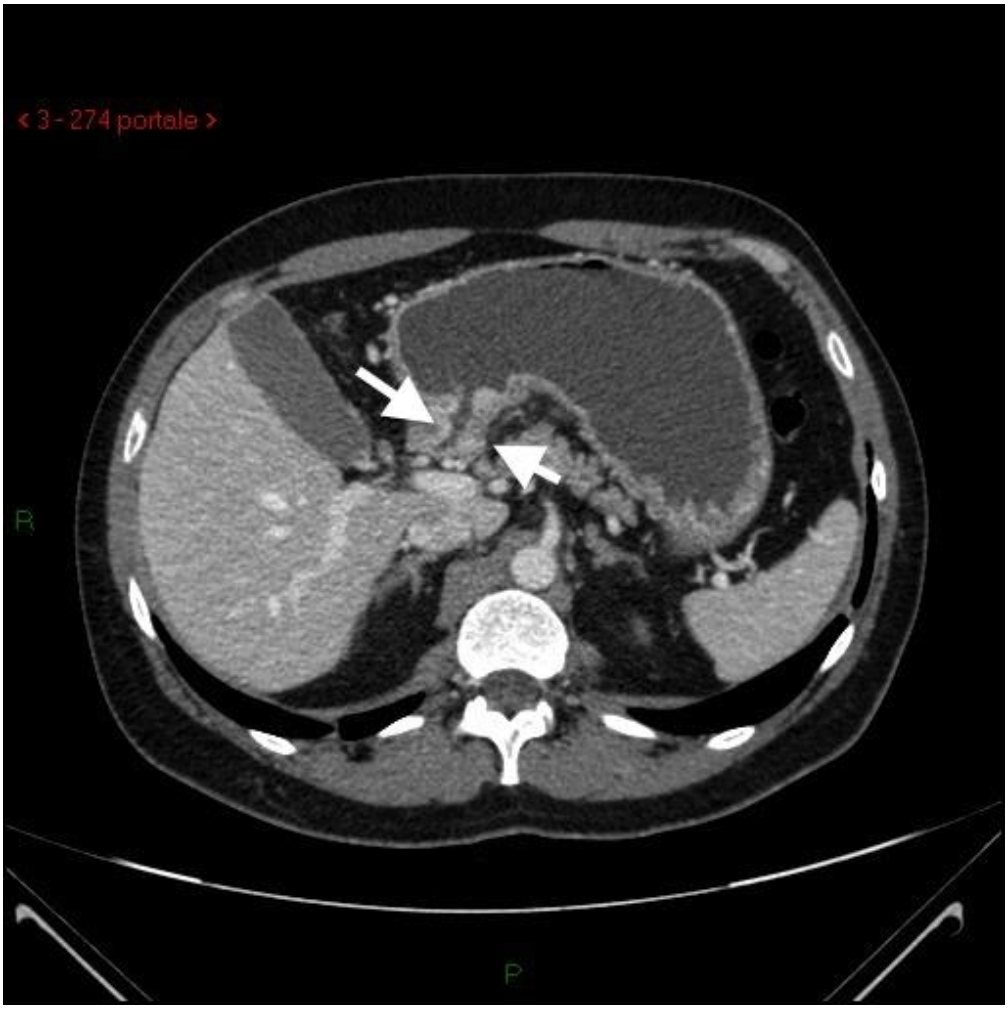
Description: Coronal MPR images shows on great curvature of the stomach, multiple bubble air (arrows). **Origin:** U.O.C Radiologia Area Nord Asl Bologna

c



Description: Axial unenhanced CT image shows normal appearance of the remaining gastrointestinal tract and mesenteric fat. **Origin:** U.O.C Radiologia Area Nord Asl Bologna

d



Description: Preoperative CT image shows: wall thickening with stricture of the antrum of stomach.
Origin: U.O.C Radiologia Area Nord Asl Bologna