An unusual duodenal mass - when 'Old is Gold'

Dr Clare Price, ST4 Radiologist
Dr Matthew Kim, Consultant Radiologist
Norfolk and Norwich University Hospitals NHS Foundation Trust

Emergency Department

- 63-year-old male
- 3-week history of shortness of breath, chest tightness and lethargy
- Background of 7-month history of post-prandial pain and episodes of malaena
- Haemoglobin 3 months previously had been 130 g/L
- Plan for urgent oesophago-gastro-duodenoscopy

Blood results in Emergency Department	
Hb (130 – 170)	81 g/L
MCV (83 – 101)	86 fL
Iron (11.6 – 31.3)	5.2 umol/L
Transferrin Saturation (16 – 45)	7%

Urgent Endoscopy

Friable hemi-circumferential abnormality in the distal duodenum with a malignant, infiltrative appearance

Biopsies taken

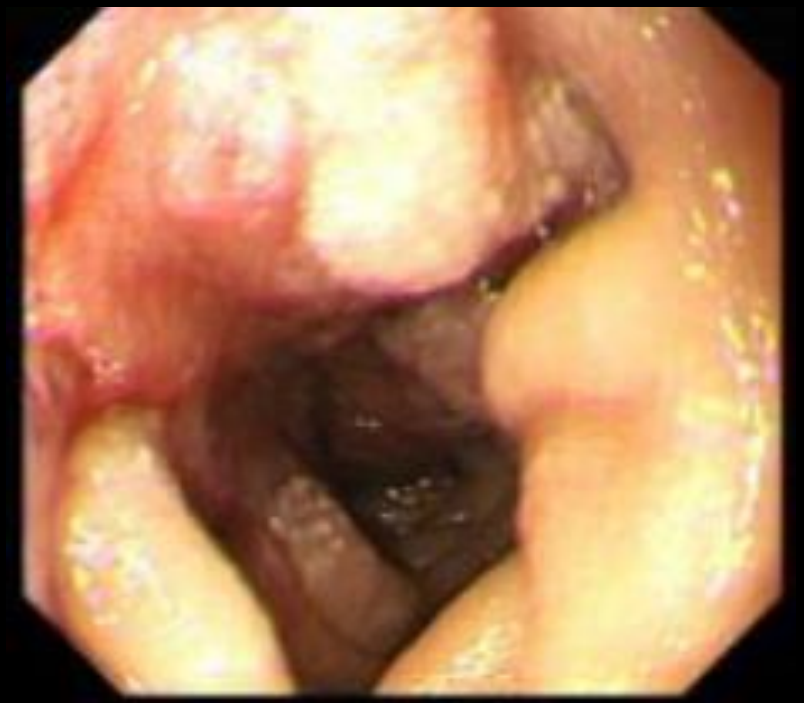
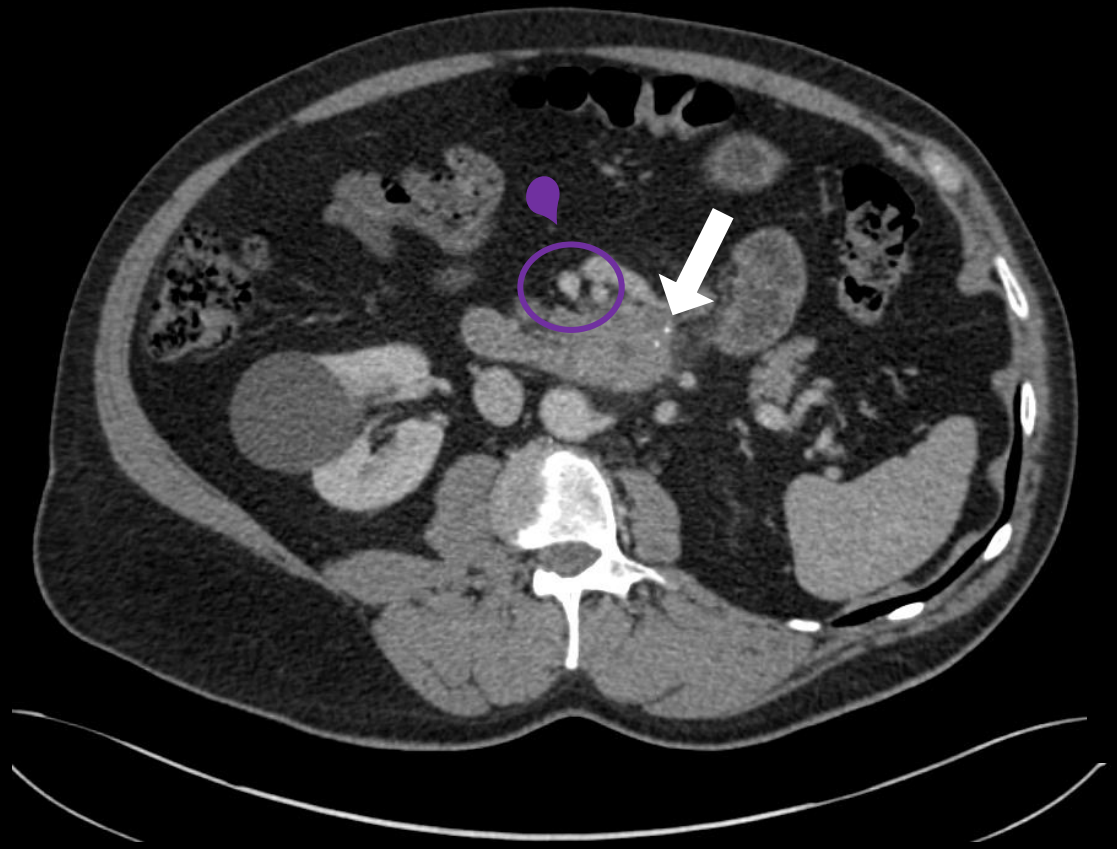
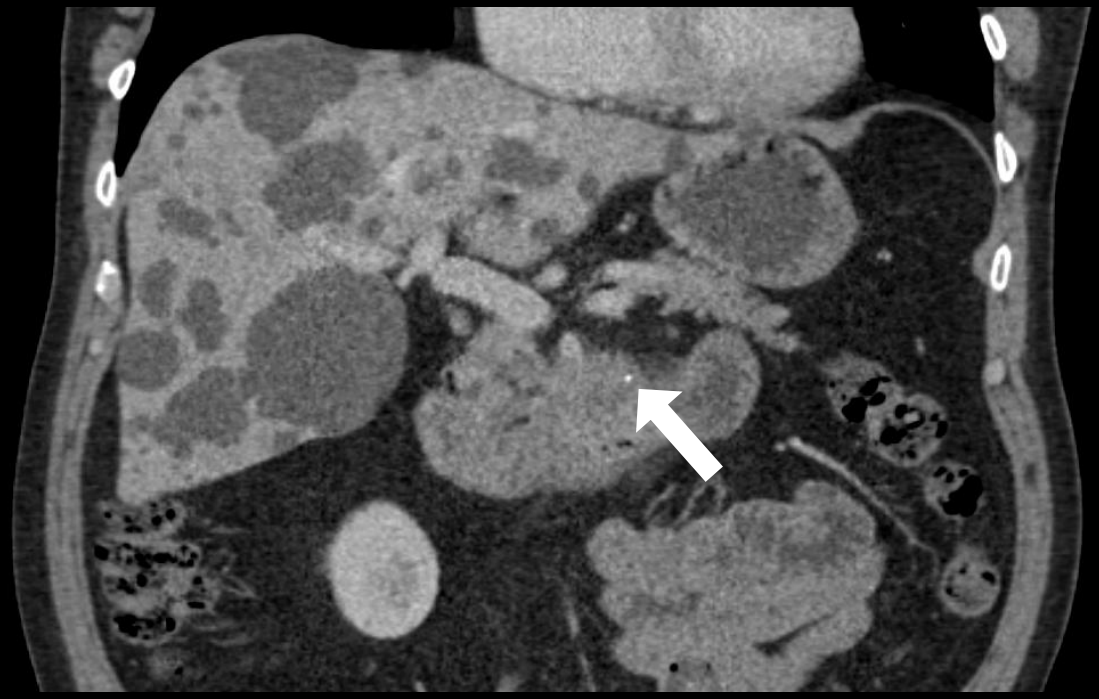


Image with thanks to Dr Mark Tremelling, consultant gastroenterologist, Norfolk and Norwich University Hospital

Portal-venous phase CT imaging – the tear drop sign

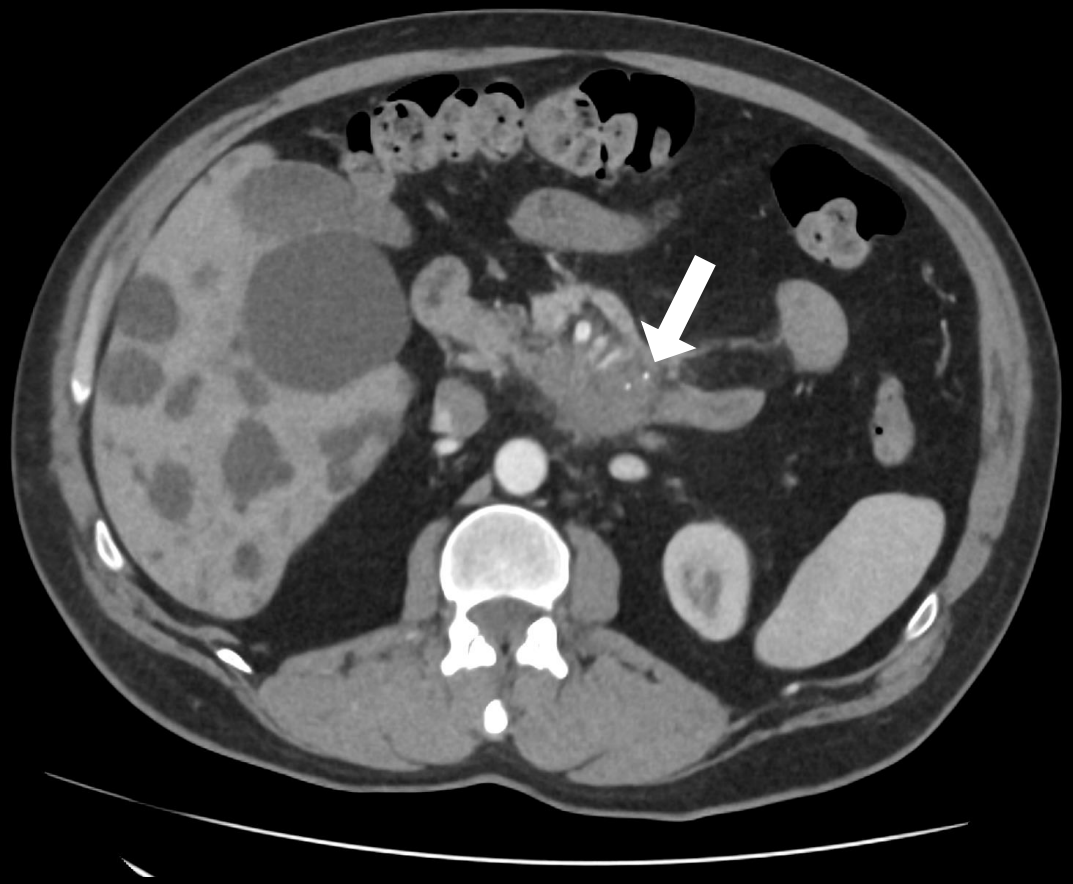


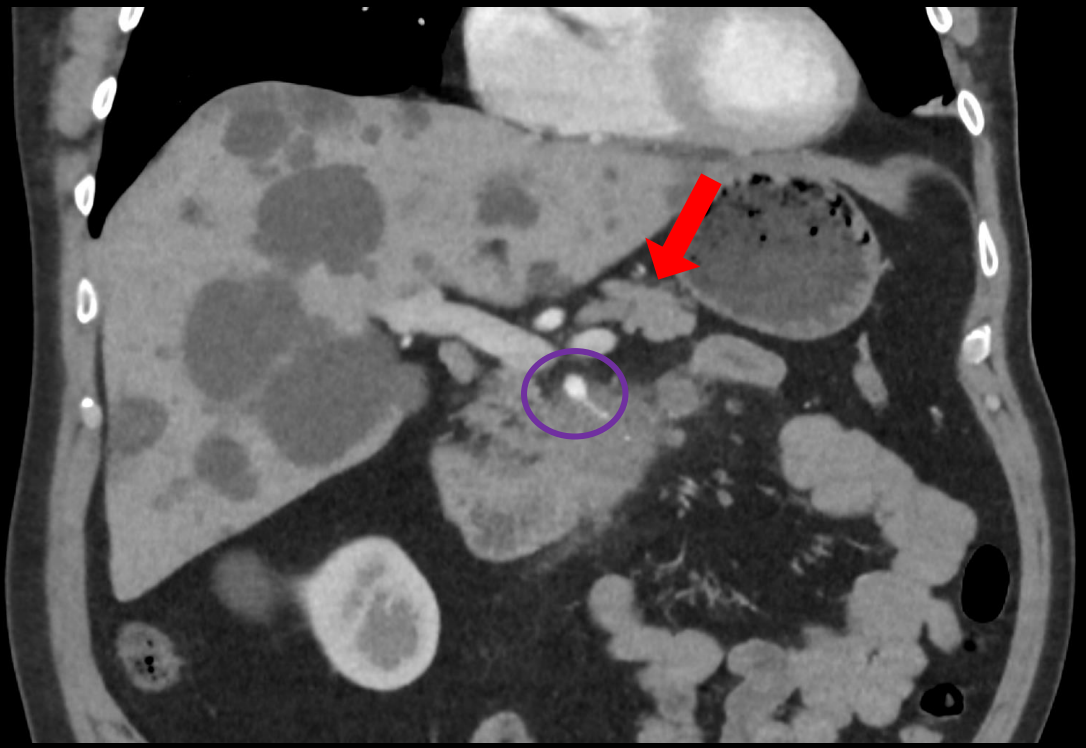


Portal-venous phase, axial oblique and coronal CT, 2023

Ill-defined heterogenous 4.5cm diameter mass arising from the fourth part of the duodenum, with flecks of internal calcification (white arrow) and peri-lesional fat stranding. Axial oblique image demonstrates a tear drop shape to the superior mesenteric vein (purple circle). Multiple hepatic simple cysts noted.

Arterial phase CT imaging





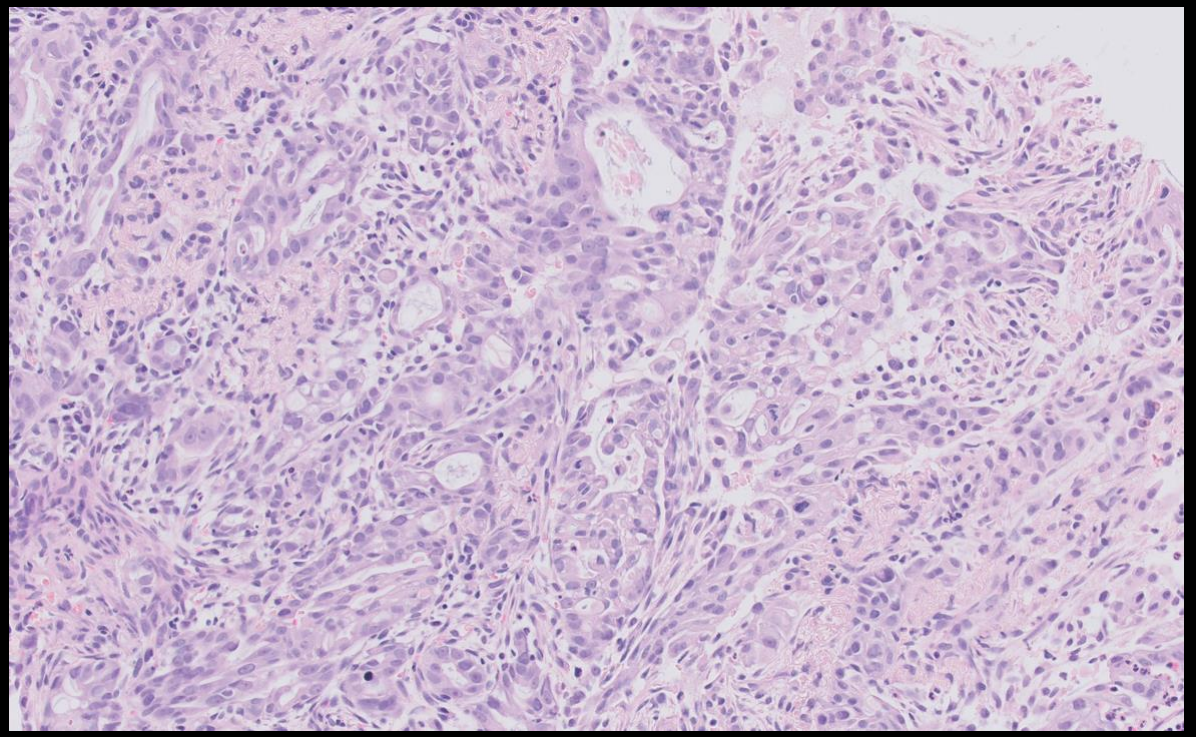
Arterial phase, axial and coronal CT, 2023

The mass infiltrates the 4th part of the duodenum (white arrow) and partially encases the superior mesenteric artery (purple circle). Note the body of the normal pancreas (red arrow) located separately.

Histopathology

‘Biopsies of small bowel mucosa showing a moderate to poorly differentiated adenocarcinoma.

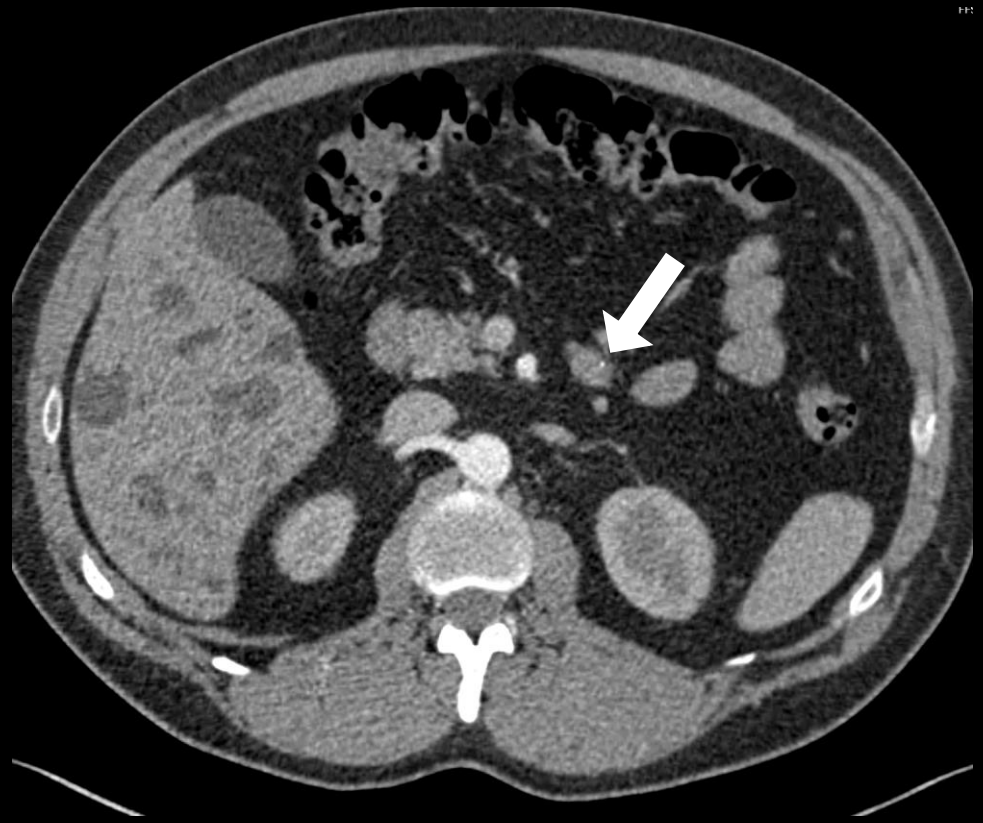
The tumour cells show diffuse positivity for MUC-5AC and CK7 and patchy positivity for MUC1. The tumour cells are negative for CDX2, CK20, MUC4 and MUC2. The immunophenotype favours a pancreatico-biliary origin.’

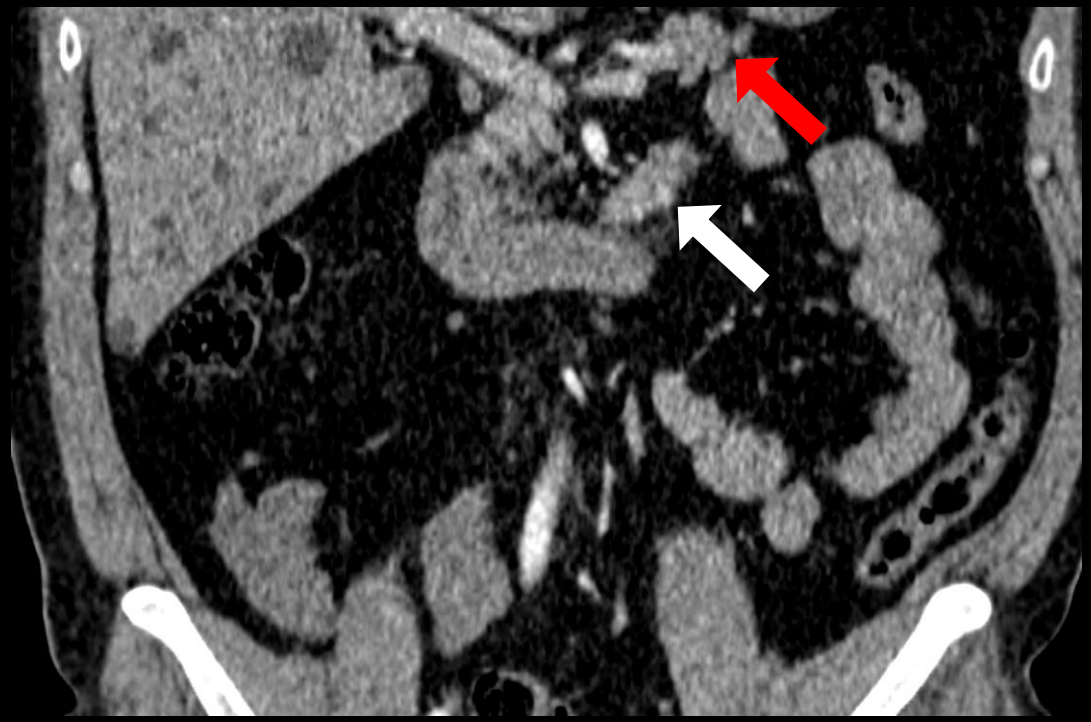


H&E (haematoxylin and eosin) stain, x 20 magnification. Image taken using Phillips Digital Pathology, with thanks to Emma Gilchrist, Consultant Biomedical Scientist, Norfolk and Norwich University Hospital

Imaging review; when ‘Old is Gold’

Reviewing the patient’s imaging packet revealed a presentation to the Emergency Department 13 years previously with chest pain. Arterial phase CT was performed at that time.





Arterial phase, axial and coronal CT, 2010

Lobulated soft tissue (white arrow) adjacent to the fourth part of the duodenum. It is separate from the normal pancreas (red arrow) but has the same attenuation characteristic. A fleck of calcification can be seen on the axial image.

Diagnosis - adenocarcinoma arising in duodenal ectopic pancreatic tissue

- This case shows malignancy developing in ectopic pancreatic tissue.
- The images from 2010 show flecks of calcification within the ectopic parenchyma, suggesting that chronic pancreatitis proceeded pancreatic cancer in this patient.
- Fibrotic tethering of the superior mesenteric vein by tumour creates a teardrop appearance and indicates vascular encasement.

Discussion

- Ectopic (also referred to as heterotopic, aberrant or accessory) pancreatic tissue lacks connection to the normal pancreas and has its own vascular and ductal system.

- The ectopic tissue can be located anywhere in the gastrointestinal tract, most commonly the stomach or duodenum.

- Rare and usually asymptomatic; it can present when complications arise such as inflammation, bleeding or malignancy.

- A meta-analysis of 13 observational studies has shown that chronic pancreatitis increases the risk of pancreatic cancer. Five years after a diagnosis of chronic pancreatitis, patients have an almost 8-fold increased risk of pancreatic cancer.

- The tear drop sign is caused by vascular encasement of the superior mesenteric vein and is associated with tumour unresectability.

Discussion

This case highlights the importance of scrutinising old images when reporting pathological findings in new imaging studies.

Instances where pathological processes are found in unusual locations might allude to anatomic variants or the presence of ectopic tissue.

The clue to the patient's diagnosis might be found in the patient's imaging packet – when 'Old is Gold'.

References

Hough TJ, Raptopoulos V, Siewert B, Matthews JB. Teardrop superior mesenteric vein: CT sign for unresectable carcinoma of the pancreas. AJR Am J Roentgenol. 1999 Dec;173(6):1509-12. doi: 10.2214/ajr.173.6.10584793. PMID: 10584793

Jiang LX, Xu J, Wang XW, Zhou FR, Gao W, Yu GH, Lv ZC, Zheng HT. Gastric outlet obstruction caused by heterotopic pancreas: A case report and a quick review. World J Gastroenterol. 2008 Nov 21;14(43):6757-9. doi: 10.3748/wjg.14.6757. PMID: 19034986; PMCID: PMC2773325

Elwir S, Glessing B, Amin K, Jensen E, Mallery S. Pancreatitis of ectopic pancreatic tissue: a rare cause of gastric outlet obstruction. Gastroenterol Rep (Oxf). 2017 Aug;5(3):237-240. doi: 10.1093/gastro/gov037. Epub 2015 Jul 29. PMID: 26224685; PMCID: PMC5566631

Kirkegård, Jakob MD1,2; Mortensen, Frank Viborg DMSc1; Cronin-Fenton, Deirdre PhD2. Chronic Pancreatitis and Pancreatic Cancer Risk: A Systematic Review and Meta-analysis. American Journal of Gastroenterology 112(9):p 1366-1372, September 2017. | DOI: 10.1038/ajg.2017.218