

## Introduction

Presence of synchronous multiple pancreatic masses is a rare finding, and any mass in the pancreas typically raises concern of undiagnosed pancreatic malignancy.

**Aim:** In this case series, patients presented with two or more synchronous solid masses as a result of pancreatic cancer (PC), autoimmune pancreatitis (AIP), and sarcoidosis.

## Case One

- 65-year-old female presented with abdominal pain and 20lbs unintentional weight loss over four months.
- CT scan revealed two suspicious solid masses in the body/tail of the pancreas (Fig1a).
- IgG4 level was normal, but CA19-9 was elevated at 75u/mL. EUS with individual fine needle biopsies (FNB) of both masses confirmed infiltrative PC.
- Due to the significant cardiac history, the patient was deemed not a surgical candidate and was referred to oncology for chemoradiation/palliative therapy.

## Case Two

- 76-year-old male presented to the hospital with postprandial abdominal discomfort and unintentional weight loss.
- CT Abdomen demonstrated localized inflammation in the pancreatic tail (Fig1b). EUS showed mass-like lesions in the pancreatic head and tail.
- Immunohistochemistry was positive for IgG4-positive plasma cells. He was diagnosed with AIP and was started on steroids.

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## Case Three

- 54-year-old male with complicated sarcoidosis (pulmonary/extrapulmonary involvement), presented with an abnormal PET scan showing focal increased uptake in the head/tail of the pancreas.
- His CT scan did not show any mass or duct dilation. EUS demonstrated ill-defined, infiltrative masses involving the pancreatic head and the tail. FNB showed scattered non-necrotizing granulomas (Fig1c).
- After excluding other causes of granulomatous diseases, he was diagnosed with pancreatic sarcoidosis.

## Figures

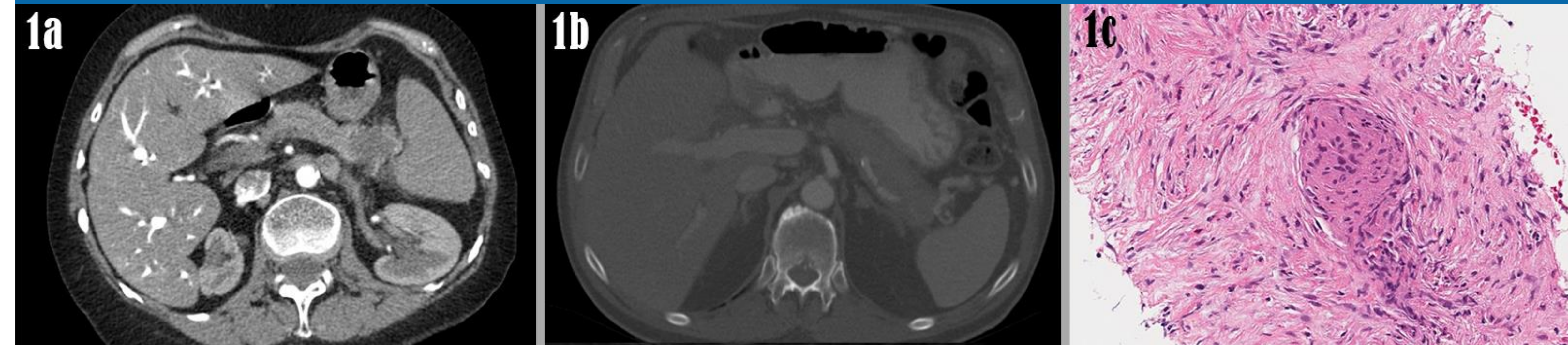


Fig 1a: Abdominal CT showing two solid masses in the body and tail of the pancreas. Fig 1b: CT Abdomen demonstrated localized inflammation in the pancreatic tail. Fig 1c: High power view of a sarcoid granuloma. (Hematoxylin and eosin, 200x magnification)

## Summary Table

| Case                     | Presentation                                                 | Past Medical History                                                                                                                                                                                                            | Pancreatic lesions                                  | Pathology facilitated by EUS-FNB                                                                                           | Management                                                                                  |
|--------------------------|--------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------|
| #1<br>65-year-old-female | Abdominal pain, unintentional weight loss, fatigue. ↑Ca19-9. | Coronary artery bypass, Heart failure, Mitral and tricuspid regurgitation, Atrial fibrillation, Pulmonary hypertension, Renal Thrombosis                                                                                        | Two (Pancreatic body and tail)                      | Adenocarcinoma                                                                                                             | Follow up with hematology/ oncology, radiation oncology, palliative care                    |
| #2<br>76-year-old male   | Postprandial gastric discomfort, unintentional weight loss   | Coronary artery disease, Uncontrolled diabetes, Previous smoker (80+ pack-years), Former alcoholic                                                                                                                              | Two (Pancreatic head, and tail)                     | Areas of fibrosis and edema with lymphoplasmacytic infiltration & immunohistochemistry was positive for IgG4+ plasma cells | Responding to steroids                                                                      |
| #3<br>54-year-old male   | Incidental findings on imaging                               | Complicated pulmonary and extrapulmonary sarcoidosis dx 2015 on prednisone taper. Waldenstrom's, marginal zone lymphoma status post chemo 2015 (Rituximab (RTX), Cyclophosphamide, Vincristine, Prednisolone) on RTX since 2017 | Three (Pancreatic head, uncinate process, and tail) | Non-caseating granulomas consistent with sarcoidosis                                                                       | Not on any sarcoidosis medications due to side effects. Clinical monitoring and cardiac MRI |

## Differential diagnosis

- Intraductal papillary mucinous neoplasms
- Chronic pancreatitis
- Autoimmune pancreatitis
- Pancreatic ductal adenocarcinoma
- Pancreatic neuroendocrine tumors
- Metastatic tumor - renal cell, lung, colo-rectal, breast, liver, ovarian, bladder, prostate, uterine, melanoma, etc
- Lymphoma
- Solid pseudopapillary tumor of the pancreas
- Sarcoidosis of the pancreas

## Discussion

- Only a few examples of synchronous pancreatic masses have been recorded in the medical literature.
- The clinical course for all of the patients differed greatly depending on the pathology.
- The plurality of solid masses and comparable imaging features of each with PC, which is the 4th highest cause of cancer-related deaths in the United States is the highlight of this series.
- When encountering such individuals, a broad differential should be examined, as the clinical history of the illness varies. The whole pancreas should be investigated with multimodal imaging and EUS-guided acquisition histopathology to reach a clear diagnosis.

## References

- Sastry A, Wayne M, Steele J, et al. Three synchronous, sporadic and separate periampullary and pancreatic tumors: more than a coincidence? World J Surg Oncol. 2014;12(1):382.
- Mehdi I, Shah AH, Moona MS, et al. Synchronous and metachronous malignant tumours expect the unexpected. J Pak Med Assoc. 2010;60(11):905-909.
- Bittorf B, Kessler H, Merkel S, et al. Multiple primary malignancies: An epidemiological and pedigree analysis of 57 patients with at least three tumours. Eur J Surg Oncol J Eur Soc Surg Oncol Br Assoc Surg Oncol. 2001;27(3):302-313.
- Gandhi NS, Feldman MK, Le O, et al. Imaging mimics of pancreatic ductal adenocarcinoma. doi:10.1007/s00261-017-1330-1
- Zhu L, Dai M, Wang S, et al. Multiple solid pancreatic lesions: Prevalence and features of non-malignancies on dynamic enhanced CT. Eur J Radiol. 2018;105:8-14.
- Adsay NV, Andea A, Basturk O, et al. Secondary tumors of the pancreas: an analysis of a surgical and autopsy database and review of the literature. Virchows Arch An Int J Pathol. 2004;444(6):527-535.
- Mayne AIW, Ahmad J, Loughrey M, et al. Sarcoidosis of the pancreas mimicking adenocarcinoma. BMJ Case Rep. 2013;2013. doi:10.1136/bcr-2013-009118
- Kajiwara M, Kojima M, Konishi M, et al. Autoimmune pancreatitis with multifocal lesions. J Hepatobiliary Pancreat Surg. 2008;15(4):449-452.