Early View Article: Online published version of an accepted article before publication in the final form.

Journal Name: Journal of Case Reports and Images in Oncology

Type of Article: Case Report

Title: Association of sarcoid-like reaction with pancreatic malignancy

Authors: Praneet Wander, Adedapo Iluyomade, Akriti Gupta, Arunpreet S. Kahlon, Aakash Aggarwal

doi: To be assigned

Early view version published: April 9, 2016


Disclaimer: This manuscript has been accepted for publication. This is a pdf file of the Early View Article. The Early View Article is an online published version of an accepted article before publication in the final form. The proof of this manuscript will be sent to the authors for corrections after which this manuscript will undergo content check, copyediting/proofreading and content formatting to conform to journal’s requirements. Please note that during the above publication processes errors in content or presentation may be discovered which will be rectified during manuscript processing. These errors may affect the contents of this manuscript and final published version of this manuscript may be extensively different in content and layout than this Early View Article.
**TYPE OF ARTICLE:** Case Report

**TITLE:** Association of sarcoid-like reaction with pancreatic malignancy.

**AUTHORS:**
1. Praneet Wander MD¹,
2. Adedapo Iluyomade MD¹,
3. Akriti Gupta MBBS²,
4. Arunpreet S. Kahlon MBBS³,
5. Aakash Aggarwal MD³

**AFFILIATIONS:**
1. Department of Internal Medicine, Mount Sinai St Luke's Roosevelt Hospital, New York,
2. Intern, Dayanand Medical College and Hospital, Ludhiana, Punjab, India,
3. Department of Internal Medicine, State University of New York Upstate Medical University, Syracuse, New York

**CORRESPONDING AUTHOR DETAILS**
Praneet Wander, MD
Department of Internal Medicine, Mount Sinai St Lukes Roosevelt Hospital, 1111 Amsterdam Ave, New York, NY 10025
Phone number: 781-363-3800
Email: praneet_wander@hotmail.com

**Short Running Title:** Sarcoid with pancreatic cancer

**Guarantor of Submission:** The corresponding author is the guarantor of submission.
TITLE: Association of sarcoid-like reaction with pancreatic malignancy.

ABSTRACT

Introduction
Paraneoplastic syndromes manifesting as non-caseating epitheloid granulomas have been documented in the medical literature since 1917. These can pose a diagnostic and therapeutic dilemma if not identified as associations.

Case Report
We present a case of mucinous adenocarcinoma in the pancreatic head, associated with hilar and mediastinal lymphadenopathy. After a complicated and ultimately terminal progression of disease, post-mortem lymph node biopsy confirmed non-caseating granulomas.

Conclusion
Thus it is prudent to identify such histopathologic changes with lymph node biopsy before further management decisions are made.

Keywords: Sarcoidosis; paraneoplastic; pancreatic cancer
TITLE: Association of sarcoid-like reaction with pancreatic malignancy.

INTRODUCTION
Sarcoidosis is a chronic, granulomatous, multisystem disease most commonly found in middle-aged women and African-Americans. Pulmonary involvement is typical, as well as intra-thoracic lymphadenopathy, but ocular and dermatologic presentations also occur. The prevalence of sarcoidosis has been reported to be as high as approximately 10 to 20 cases per 100,000 people [1,2]. Additionally, sarcoid-like reactions occur secondary to malignancy in 4.4% of carcinomas, 13.8% of Hodgkin’s lymphomas and 7.3% of non-Hodgkin lymphomas [3,4]. This reaction can occur within the malignant tissue, lymph nodes draining the tumor or in non-regional tissues.

CASE REPORT
A 67 year-old Caucasian male with past medical history of hypogonadism, hyperlipidemia, depressive mood disorder, chronic obstructive pulmonary disease, type 2 diabetes mellitus, coronary artery disease and hypothyroidism presented with a one year history of weight loss of approximately 20 pounds. Laboratory analysis was significant for transaminitis, with alanine transaminase & aspartate transaminase both >200 IU, alkaline phosphatase >1200 IU, total bilirubin 7 mg/dl, direct bilirubin 5 mg/dl, albumin 2 mg/dl. Diagnostic imaging revealed CT abdomen and pelvis with new significant extra and intrahepatic biliary ductal dilatation associated with abrupt narrowing of the distal common bile duct at the level of the pancreatic head. There was radiographic evidence of pancreatic ductal dilatation that appeared chronic in nature. There was slight interval increase in fullness of the pancreatic head compared a previous study from 4 years prior. Additionally, there was a questionable soft tissue density that projected into the second part of the duodenum, suspicious for neoplasm of the pancreatic head. Lastly, there was interval increase in peri-pancreatic and retroperitoneal lymphadenopathy. An ERCP with biopsy was performed, and histopathologic analysis demonstrated mucinous carcinoma of the pancreas. The patient’s hospital course was complicated by acute cholangitis and pancreatitis deemed secondary to the endoscopic intervention into
the biliary system. A subsequent PET scan of the chest revealed hilar and mediastinal lymphadenopathy (Figure 1). The patient was eventually stabilized and referred for hospice care. A few months later he expired as a result of complications from pancreatic adenocarcinoma. An autopsy was requested by the family, which revealed non-caseating granulomatous inflammation of the hilar and mediastinal lymph nodes consistent with sarcoidosis.

**DISCUSSION**

The first case of malignancy with associated sarcoidosis was reported in 1917 [5]. Reported as “sarcoid-like reactions”, they are usually related to lymph node drainage of primary tumors and other extranodal sites [3]. The presentation is often times atypical without classic sarcoid laboratory findings. Since 1917 the medical literature has shown that, in cases of sarcoidosis associated with mycobacterial infections, the granulomas are B-cell negative; and conversely B-cell positive in sarcoid-like reactions associated with toxoplasmosis [8]. These reactions occur as part of a T-cell mediated response to antigenic factors shed by tumor cells, or released during tumor necrosis. The lymphangitic spread results in a hypersensitivity-like reaction producing non-caseating granulomas [3]. On PET/CT imaging, systemic sarcoidosis, sarcoid-like reactions and hepatopancreaticobiliary malignancies are indistinguishable and are thus difficult to classify [6,7]. Corticosteroids are considered beneficial in reducing the degree of transaminitis. Additionally, in previously reported cases where sarcoid-like reactions are proven on biopsy, it is recommended that patients be treated with corticosteroids prior to initiation of chemotherapy or planned tumor resection [9].

**CONCLUSION**

It is prudent to identify these histopathologic changes with lymph node biopsy before further management decisions are made.

**CONFLICT OF INTEREST**

To the best of our knowledge, no conflict of interest, financial or other, exists.
AUTHOR’S CONTRIBUTIONS

Praneet Wander,
Group 1: substantial contributions to conception and design, acquisition of data, analysis and interpretation of the data
Group 2: drafting the article, revising it critically for important intellectual content
Group 3: final approval of the version to be published

Adedapo Iluyomade
Group 1: acquisition of data
Group 2: drafting the article
Group 3: final approval of the version to be published

Akriti Gupta
Group 1: substantial contributions to conception and design
Group 2: drafting the article
Group 3: final approval of the version to be published

Arunpreet S. Kahlon
Group 1: analysis and interpretation of the data
Group 2: revising it critically for important intellectual content
Group 3: final approval of the version to be published

Aakash Aggarwal
Group 1: substantial contributions to conception and design
Group 2: revising it critically for important intellectual content
Group 3: final approval of the version to be published

ACKNOWLEDGEMENTS
No grants or financial support received. No other author contributions to report.
Previous Presentation: this case was presented as a poster at the American College of Gastroenterology 2015 Annual Scientific Meeting and Post Graduate Course; 20 October, 2015; Honolulu, Hawaii.

GUARANTOR STATEMENT
This manuscript has not been previously published and is not under consideration in the same or substantially similar form in any other peer-reviewed media. No portion
of the text has been copied from other material in the literature (unless in quotation
marks, with citation).

REFERENCES


FIGURE LEGEND

Figure 1: Figure 1- A PET scan showing highlighted enlarged mediastinal lymph nodes (black arrow).
Figure 1 - A PET scan showing highlighted enlarged mediastinal lymph nodes (black arrow).