

Mimicking pancreatic malignancy: a systemic sarcoidosis

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Systemic sarcoidosis that initially presents as a pancreatic mass has rarely been reported. A 47-year-old man presented with idiopathic epigastric abdominal pain. Abdominal CT showed multiple enlarged lymph nodes in the retroperitoneal area and a suspected tumor mass in the pancreatic head region. The preliminary diagnosis was celiac metastasis of a pancreatic malignancy. The definitive diagnosis was systemic sarcoidosis, which was supported by granulomas on histology, clinical radiographic findings, and clinical response to steroids. A review of published reports on sarcoidosis presenting initially as a pancreatic or celiac mass from the Chinese biomedical database (1978–2010) is included.

Sarcoidosis is a multisystem disorder with unknown aetiology. It frequently presents with bilateral hilar lymphadenopathy, pulmonary infiltration, and ocular and skin lesions. The diagnosis is established when clinical radiographic findings are supported by histologic evidence of non-caseating epithelioid cell granulomas.¹ Cases of pancreatic sarcoidosis are uncommon. Nickerson² first described this finding in 1937, by autopsy of a patient with unrecognized sarcoidosis. This report describes a rare case of sarcoidosis presenting as a mass in the head of the pancreas, which was suggestive of a pancreatic malignancy and provides an extensive review of associated published reports.

CASE

A 47-year-old Chinese man was admitted at night to a local primary hospital for the first time because of persistent severe epigastric abdominal pain without radiating or referred pain. The symptom appeared unexpectedly without fever, jaundice, nausea, or vomiting and spontaneously resolved four hours later. The patient had previously been in good health. No laboratory tests, imaging studies, or therapy was performed the night the patient presented. The following day, abdominal computed tomographic scan was performed, the results of which revealed multiple enlarged lymph nodes in the retroperitoneal area and a suspected tumor mass in the pancreatic head region (**Figure 1**). Chest radiography

revealed changes consistent of bronchitis. No laboratory tests were performed. The symptoms resolved spontaneously and did not recur. The patient was referred to a cancer hospital and presented approximately two weeks later for further evaluation of the suspected pancreatic neoplasm. The patient underwent exploratory laparotomy and retroperitoneal lymph node biopsy in the cancer hospital. The postoperative pathologic tissue diagnosis was reported as granulomatous lesions with no signs of malignancy. Subsequently, the patient was admitted to the outpatient department of our hospital for suspected gastrointestinal sarcoidosis. Laboratory testing revealed that the purified protein derivative (PPD) skin test result was negative, serum angiotensin-converting enzyme (ACE) level was 61.51 U/L (normal range, 23–43 U/L), and the level of immunoglobulin G antibody was normal. The anti-double-stranded DNA antibody, antinuclear antibody, and antineutrophil cytoplasmic antibodies were all negative. CT of the chest showed mediastinal lymphadenopathy. On the preliminary tests, the patient was initially diagnosed with retroperitoneal and mediastinal lymphadenopathy likely secondary to sarcoidosis. Finally, the patient was admitted to the pulmonary department of our hospital for the definitive diagnosis. The physical examination on admission was unremarkable. Laboratory tests revealed that blood count, liver function, and renal function were all within normal limits. Tumor markers were within the normal range.

ACE level was 117.37 U/L, significantly higher than the levels obtained in the outpatient setting. The repeat chest CT showed mediastinal and hilar lymphadenopathy and multiple bilateral pulmonary lesions (Figure 2). The abdominal ultrasonography revealed hypoechoic nodules in the pancreatic head region. The pathologic slices of retroperitoneal lymph node were sent to the pathology department of the hospital as well as to a specialty tuberculosis hospital for consultation. Results showed a granulomatous lesion. Further, acid-fast bacilli test results were negative, and both these results were supportive of the diagnosis of sarcoidosis (Figure 3). Because of these studies, therapy with prednisone (40 mg per day) was started. After five months on corticosteroid therapy, imaging studies showed dramatic improvement and complete regression of all lesions. On the basis of clinical presentation, chest and abdominal CT imaging results, response to steroids, and retroperitoneal lymph node pathology report, systemic sarcoidosis was diagnosed. Corticosteroid therapy was tapered and eventually discontinued over two years. The patient has not experienced any recurrence of sarcoidosis in the subsequent three years of follow-up.

DISCUSSION

Sarcoidosis suggestive of pancreatic malignancy is an unusual occurrence, and most reported cases involve localized lesions in the head of the pancreas. Abdominal pain is one of the most common clinical presentations of sarcoidosis. The earliest report of surgically diagnosed sarcoidosis of the pancreas was published by Curran and Curran in 1950.³ Cases reported previously were mostly confirmed by laparotomy. In the published reports, the patient in 31 published cases underwent surgical exploration.^{4,6} In the majority of cases, total pancreatectomy or pancreaticoduodenectomy was performed. In the current case, the clinical presentations and findings of abdominal imaging were consistent with pancreatic malignancy. Furthermore, at the initial assessment, the patient had no indication of pulmonary involvement. The patient had undergone a laparotomy and retroperitoneal lymph node biopsy prior to admission to our hospital, and because the surgery was performed at another institution, intraoperative findings were unavailable. However, the patient had not undergone a comprehensive resection. The postoperative pathologic diagnosis was reported as a granulomatous lesion. In our hospital, laboratory tests showed a persistent increase in the ACE level; moreover, PPD skin test results were negative and tumor markers were within the normal range. The chest CT showed mediastinal and hilar lymphadenopathy as well as multiple

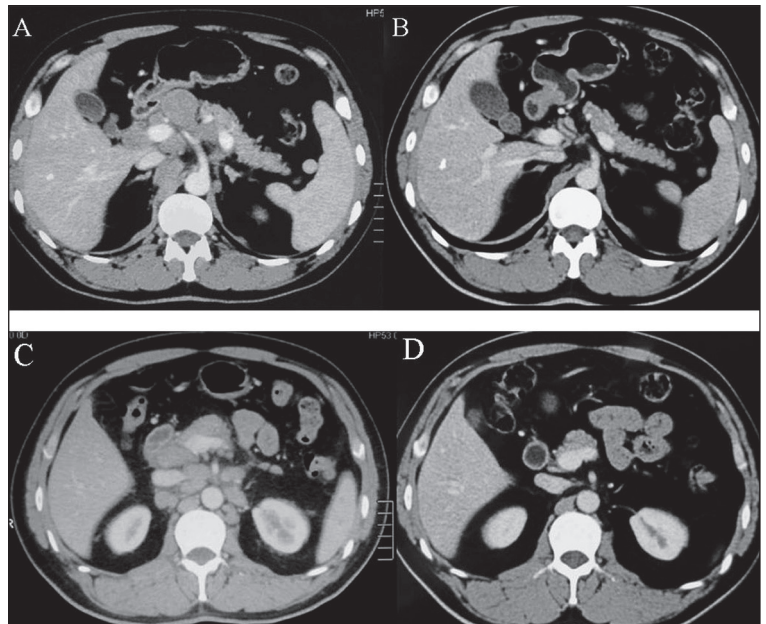


Figure 1. CT of the abdomen demonstrating multiple pathologically enlarged retroperitoneal lymph nodes and a mass in pancreatic head region (A,C). Lesion recovered after the treatment of prednisone (B,D).

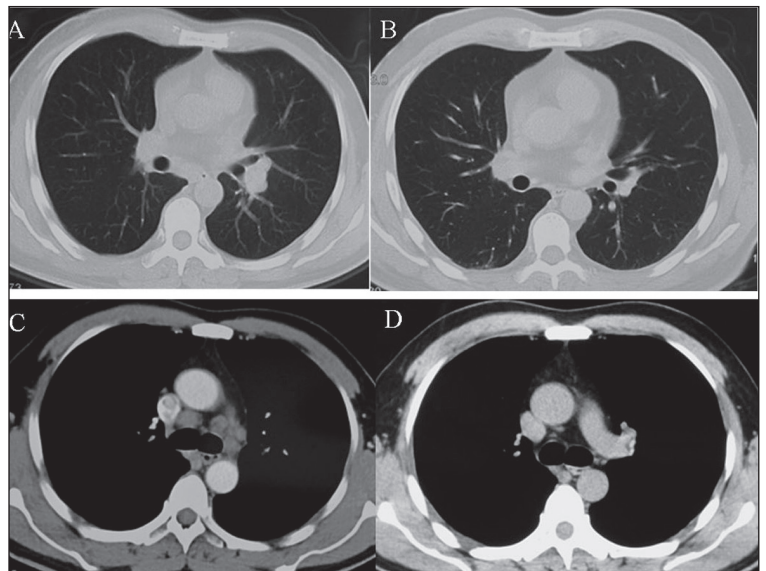


Figure 2. CT of the chest showed mediastinal and hilar lymphadenopathy and bilateral pulmonary multiple lesions (A,C). Lesion recovered after the treatment of prednisone (B,D).

bilateral pulmonary lesions. Pathologic slices of retroperitoneal lymph node were sent for examination and consultation to both our pathology department and to a specialty tuberculosis hospital. Results also showed a granulomatous lesion, which supported a diagnosis of sarcoidosis. In addition, the patient's condition im-

Table 1. Summary of case reports.

Author	Age /Sex	Presentation	PPD	ACE	CRX /Chest CT	CT of abdomen	Gastroscopes/	Surgical intervention	Histology
Han and Zhang ⁷	69/F	Abdominal distention	Negative	Unknown	Normal	Unknown	Unknown	Exp lap, Greater omentectomy and bilateral oophorectomy	Granuloma
Li and Zhang ⁸	38/M	Abdominal mass	Unknown	Unknown	A shadow in right lung	Multiple nodular change in liver and a celiac mass	Unknown	Exp lap, celiac mass excision	Granuloma
Wang et al ⁹	36/M	Abdominal pain tarry stool	Unknown	Unknown	Unknown	Unknown	Duodenal duodenobulbar ulcer Duodenum insufficiency obstruction	Exp lap, gastrojejunostomy celiac lymph nodes biopsies and celiac mass excision	Granuloma
He ¹⁰	54/F	Abdominal pain	Unknown	Unknown	Normal	Caput pancreatis satiation adrenal gland nodule	Arcus minor ventriculi and duodenum were compressed	Exp lap, caput pancreatis mass excision	Granuloma
Zhang ¹¹	43/M	Abdominal pain Abdominal distention	Unknown	Unknown	Normal	Unknown	Gastrectoma	Exp lap, arcus minor ventriculi mass excision and celiac lymph nodes biopsies	Granuloma
This article	47/M	Abdominal pain	Negative	Elevated	Mediastinal and hilar lymphadenopathy and bilateral pulmonary multiple lesions	Multiple enlarged lymph nodes in the retroperitoneal and a mass in pancreatic head region	Unknown	Exp lap, retroperitoneal lymph node biopsy	Granuloma

proved dramatically by corticosteroid therapy within a short time, which further supported a final diagnosis of systemic sarcoidosis. Although systemic sarcoidosis initially presenting as a pancreatic mass is rare, it should be considered in the differential diagnosis.

Systemic sarcoidosis presenting as a pancreatic or celiac mass has rarely been reported in China. All published case reports were identified by electronic search of the Chinese biomedical database (1978–2010).¹⁰ A search for the medical subject headings “sarcoidosis” yielded five cases with celiac mass diagnoses that were surgically proved to be sarcoidosis. **Table 1** summarizes the current case and the cases found in the search of published reports. The average age of the patients at the time of diagnosis of sarcoidosis was approximately 48 years (range: 36–69 years). The most common symptom was abdominal pain, observed in four of the six patients. The male-to-female ratio was 4:2. PPD was documented as negative in two of the cases,⁷ but not documented in the other four cases.^{8–11} Serum ACE values have been shown to be useful in identifying approximately 80% of patients with active sarcoidosis.¹² However, it is also elevated in several other disorders, including tuberculosis, leprosy, active histoplasmosis, asbestosis, and Crohn disease. However, elevated serum ACE levels can provide supporting evidence for sarcoidosis and reflect total granuloma burden.¹² Radiologic evidence of bilateral hilar adenopathy is frequently observed in sarcoidosis, the incidence of which is reported to be 75% to 90%. However, for pancreatic sarcoidosis, the rate of bilateral hilar lymphadenopathy was only reported as 26%.⁴ In all of the published articles, only the current case included the serum ACE levels and reported hilar lymphadenopathy. In these previous studies, abdominal imaging or ultrasonography demonstrated a celiac mass and multiple enlarged lymph nodes, and showed that abdominal organs were infiltrated. Based on the preoperative evaluation, all patients underwent an exploratory laparotomy. Five of the six cases underwent celiac mass or enlarged lymph nodes biopsies.^{8–11} One case was managed with a gastrojejunostomy because intraoperative exploration showed that the ascending and horizontal parts of the duodenum were shortened, the duodenum was infiltrated by a mass, and

multiple celiac lymph nodes were enlarged.⁹ In another case, a greater omentectomy and bilateral oophorectomy were performed, because the patient was found to have 2000 mL of ascites and omental cake.⁷ There is no specific test for the preoperative diagnosis of sarcoidosis without the presence of classic clinical findings and a previous pathologic diagnosis. Preoperative and intraoperative diagnosis of sarcoidosis is very difficult. Some evidence supportive of a preoperative diagnosis, such as bilateral hilar adenopathy, bilateral pulmonary involvement, mediastinal lymphadenopathy, and maculopapular skin lesions. Preoperative biopsy of a celiac mass or enlarged lymph nodes may reduce the need to perform a comprehensive resection. Pre-operative biopsy of pancreatic lesions suspected to be resectable malignancy is controversial. However, a histologic proof is necessary for unresectable pancreatic malignancy. Both CT- and ultrasonography-guided percutaneous fine-needle aspirations (FNAs) of pancreatic lesions have been reported with accuracies of 61% to 98%. However, percutaneous FNA has been associated with a false-negative rate of 20%.¹³ In comparison with percutaneous FNA, endoscopic ultrasound (EUS)-guided FNA has a greater sensitivity for smaller lesions, and the risk of needle-tract seeding seems to be minimized.¹⁴ When percutaneous and EUS-guided pancreatic FNA fails to obtain a diagnostic specimen, a laparoscopic approach may be employed. Butturini et al¹⁵ reported that laparoscopic biopsy of advanced unresectable pancreatic cancer is a feasible, safe, and reliable procedure to obtain a histologic diagnosis. Of the patients thought to have a resectable pancreatic malignancy on the basis of good-quality preoperative imaging, 44% had their management approach altered after laparoscopy and avoided an open procedure.¹⁶ Recently, Durai et al¹⁷ reported that a laparoscopic approach is a safe and effective technique for obtaining an adequate volume of retroperitoneal lymph node tissue for typing. This approach yielded a final diagnosis of sarcoidosis in one patient. Laparoscopy may therefore be used in the preoperative diagnosis of sarcoidosis, when a pancreatic tumor is suspected. Further research, however, is needed to find a more effective method for the preoperative diagnosis of sarcoidosis.

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