



Pancreatic cancer Masquerading as lung nodules: A Diagnostic Dilemma

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ABSTRACT

To our knowledge, this is the first report of isolated pulmonary nodules as an initial presentation of underlying pancreatic cancer. We present a case of metastatic pancreatic cancer which manifested as worsening bilateral pulmonary nodules and normal abdominal imaging in a 72-year-old female patient. A navigational bronchoscopy with biopsy of lung nodules was performed which showed poorly differentiated adenocarcinoma. Carcinoembryonic antigen and CA 19-9 levels were elevated so endoscopic ultrasound with fine needle aspiration was done which revealed an underlying occult pancreatic adenocarcinoma. The patient was treated with chemotherapy. Patients with pulmonary metastasis have been shown to confer longer survival as compared to metastatic disease involving other organs. We have briefly reviewed the epidemiology, clinical characteristics and management of such cases in our report.

Introduction

Pancreatic cancer is often diagnosed at unresectable stage due to its non-specific symptomatology, at which point the cancer carries a grave prognosis. Synchronous and metachronous pulmonary metastases from pancreatic adenocarcinoma are well-documented in the literature [1,2]. To our knowledge, isolated pulmonary nodules as an initial presentation of underlying pancreatic adenocarcinoma has not yet been reported. We present a case of metastatic pancreatic cancer which manifested as worsening bilateral pulmonary nodules and normal abdominal imaging.

Case description

A 74-year-old Caucasian female with a past medical history of melanoma in situ, basal cell carcinoma, multiple neurofibromas on back status post resection, chronic obstructive pulmonary disease, and dyspepsia presented to gastroenterology clinic for follow-up of dyspepsia. She reported a history of tobacco use of 90 pack/year and had quit 23 years prior. Family history was significant for colon cancer in the patient's sister, though the age at diagnosis was unknown. A year prior to presentation, a computed tomography (CT) chest, abdomen and pelvis was obtained for unexplained abdominal pain which did not suggest any abdominopelvic pathology, but did reveal basal bilateral pulmonary nodules (Fig. 1).

A repeat CT chest with contrast was done which showed bilateral pulmonary nodules, increasing in size and number, concerning for lung cancer. Subsequently, a navigational bronchoscopy with biopsy of right upper lung nodule showed moderate to poorly differentiated adenocarcinoma (Fig. 2).

Thyroid transcription factor-1 (TTF-1) is positive in primary lung adenocarcinoma which was negative in our patient. Overall findings were consistent with adenocarcinoma of unknown origin. With concern for metastasis, and in pursuit of the source of unexplained abdominal pain, carcinoembryonic antigen (CEA) and CA 19-9 levels were obtained, measuring at 52.6 ng/ml (normal value < 5.0 ng/ml) and 6198 (normal value: 0–37 U/mL), respectively. Hence, a repeat CT abdomen and pelvis with contrast was obtained which revealed non-specific periceliac soft tissue density with questionable involvement of pancreatic body, suspicious for nodal metastasis and possible primary pancreatic neoplasm. Fluorodeoxyglucose (FDG)- positron emission tomography (PET) scan showed FDG avid pulmonary nodules and FDG avid area in the left fossa of Rosenmuller as well as near the aorta adjacent to the pancreatic body (Fig. 3).

Endoscopic ultrasound (EUS) was done which showed hypoechoic mass within the body of the pancreas measuring 26 × 19 mm. Biopsy of the pancreatic mass showed well-differentiated adenocarcinoma consistent with an overall diagnosis of Stage IV pancreatic adenocarcinoma (Fig. 4).

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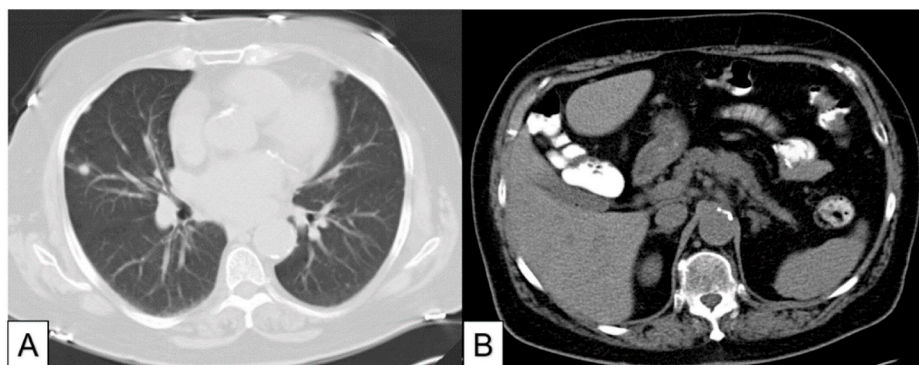


Fig. 1. CT chest shows a solitary lung nodule in the right middle lobe (Panel A); CT abdomen at the level of the pancreas depicts normal-appearing pancreas and ducts (Panel B).

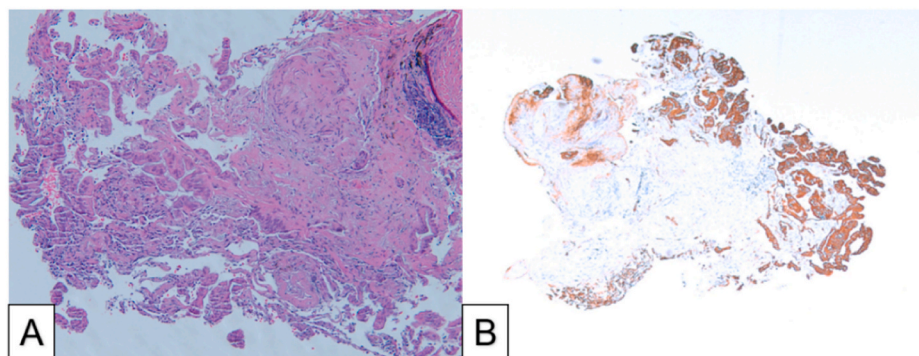


Fig. 2. A transbronchial right upper lobe nodule biopsy shows malignant glandular proliferation admixed with areas of fibrosis and inflammatory reaction, consistent with moderately differentiated adenocarcinoma (Panel A), while on immunohistochemical staining malignant cells are positive for CK7 and negative for CK20, TTF-1, CDX-2, GATA-3, PAX-8, WT-1, pan melanoma and HMB-45 (Panel B).

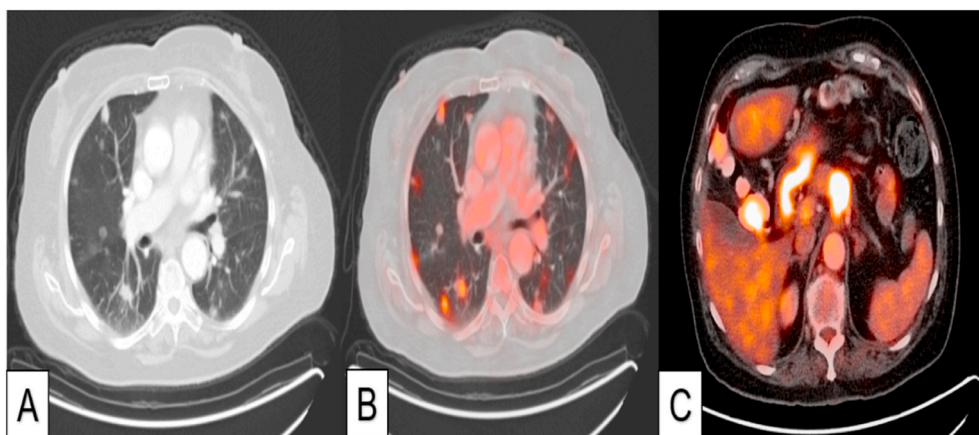


Fig. 3. Multiple bilateral lung nodules (Panel A). Contrast enhanced PET scan shows multiple FDG avid lung nodules bilaterally with SUV values ranging from 4.1 to 5.6 (Panel B). A PET scan shows FDG avid area in the left fossa of Rosenmuller as well as near the aorta adjacent to the pancreatic body (Panel C).

Magnetic resonance imaging (MRI) brain was unrevealing. Subsequently the patient was started on gemcitabine and paclitaxel chemotherapy and was followed up as an outpatient. The patient experienced

progression of disease after completion of 21 cycles of chemotherapy; hence, a regimen of fluorouracil and irinotecan was initiated. The patient was lost to follow-up after two years of treatment.

Discussion

Pancreatic cancer represents 3.2% of all the new cases of cancer in the United States, and of newly diagnosed cases, 52% are metastatic with a 5 year survival of 2.9% [3]. Known risk factors that can predispose to pancreatic cancer includes advanced age, smoking and genetic predisposition. Patients may present with abdominal pain, weight loss, anorexia and jaundice, particularly with the involvement of pancreatic head with tumor. Most commonly pancreatic cancer metastasizes to the liver, lungs, lymph nodes, peritoneum and bones [4]. Pulmonary metastases are seen more frequently in pancreatic body and tail cancer [5]. Diagnostic work up begins with abdominal imaging including ultrasound abdomen in cases with obstructive hepatopathy followed by CT abdomen for better characterization of pancreatic mass. The sensitivities of CT scan abdomen and EUS to detect pancreatic cancer are noted to be 55–67% and 90–100%, respectively [6]. When CT abdomen is equivocal, such as in the present case, EUS should be the test of choice to diagnose underlying pancreatic cancer. Preoperative work up for pancreatic cancer can lead to identification of indeterminate pulmonary nodules (IPN) in 18–71% of the cases, though in resectable cases of pancreatic cancer IPN does not affect overall survival after surgery [7]. Pulmonary involvement has been reported with varied radiological patterns such as nodules with halo signs, ground glass opacities, and consolidations [1]. Isolated pulmonary nodules with occult malignancy in pancreatic body or tail can mimic lung cancer, as seen in our patient, often prompting lung biopsy. If staging CT scan chest demonstrates benign appearing nodules or no nodules, usually no routine follow up chest imaging is needed [8]. Treatment of pancreatic cancer involves a multidisciplinary approach depending on stage of the disease, functional status and genetic testing which are beyond the scope of this discussion. Though resection of pancreatic cancer with single organ pulmonary metastasis might offer survival benefit in selected cases [2]. While the prognosis of metastatic pancreatic is very poor, surprisingly, patients with single organ or solely pulmonary metastasis have been shown to confer longer survival as compared to metastatic disease involving other organs [4,9,10]. Despite of 15–20% patients with respectable disease at the time of diagnosis, only 20% survive to 5 years [11]. We suggest that in patients older than 60 years who present with abdominal pain and weight loss, pancreatic cancer should be considered in the differential diagnosis.

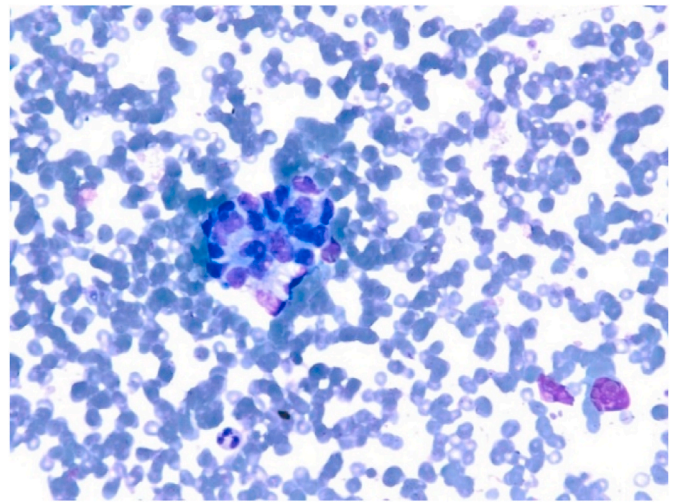


Fig. 4. Fine needle aspiration (FNA) of pancreatic mass shows cellular aspirate with malignant ductal epithelial cells appearing singly and in clusters, consistent with well-differentiated ductal adenocarcinoma.

Prior presentations

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Declaration of competing interest

All the authors have seen and approved the manuscript. The authors report no conflicts of interest.

Learning points

- Endoscopic ultrasound should be utilized in the evaluation of pancreatic cancer in suspicious cases with equivocal findings on CT abdomen.
- Isolated pulmonary nodules can be an initial presentation of metastatic pancreatic cancer.
- Solitary pulmonary metastases have better prognosis in the pancreas compared with metastasis to other organs.

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