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Rakahn Haddadin
Department of Internal Medicine, HCA Healthcare; MountainView Hospital, Las Vegas, NV, USA, rakahn.haddadin@hcahealthcare.com

Humzah Iqbal
Department of Internal Medicine, University of California San Francisco, Fresno, CA, USA, affiliation with HCA Healthcare

Danny Aboujamra
St. George's University School of Medicine, Affiliation with HCA Healthcare

George Trad
Department of Gastroenterology, HCA Healthcare; Southern Hills Hospital, Las Vegas, NV, USA

John Ryan
Department of Gastroenterology, HCA Healthcare; Southern Hills Hospital, Las Vegas, NV, USA

See next page for additional authors

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CASE REPORT

A Rare Case of Isolated Metastasis to the Pleura in the Setting of Newly Diagnosed Pancreatic Adenocarcinoma

Rakahn Haddadin [a,*], Humzah Iqbal [b], Danny Aboujamra [c,d], George Trad [e], John Ryan [e], Hatim Gemil [a]

[a] Department of Internal Medicine, HCA Healthcare, MountainView Hospital, 2880 N Tenaya Way Las Vegas, Las Vegas, NV 89128, USA
[b] Department of Internal Medicine, University of California San Francisco, Affiliation with HCA Healthcare, 155 N. Fresno St. Fresno, CA 93701, USA
[c] St. George's University School of Medicine, Affiliation with HCA Healthcare, Grenada
[d] University Centre Grenada, West Indies, Grenada
[e] Department of Gastroenterology, HCA Healthcare, Southern Hills Hospital, 2880 N Tenaya Way Las Vegas, Las Vegas, NV 89128, USA

Abstract

In the landscape of pancreatic cancer, extra-pancreatic manifestations like pleural effusion are infrequent. Our case spotlights a 78-year-old female with a recent diagnosis of pancreatic adenocarcinoma with isolated metastasis to the pleura. The patient presented with exacerbated dyspnea and cough, shedding light on the uncommon link between pancreatic adenocarcinoma and pleural effusion. Pancreatic cancer typically exhibits nonspecific symptoms, and its association with pleural effusion significantly complicates diagnosis, often leading to delayed recognition and management challenges. This case underscores the diagnostic complexities and the need for heightened vigilance when faced with atypical presentations in pancreatic cancer, emphasizing the intricacies of managing such rare extra-pancreatic manifestations.

Keywords: Pancreatic, Cancer, Pleural effusion, Metastasis

1. Introduction

Pancreatic cancer represents a formidable challenge in oncology due to its aggressive nature and often asymptomatic early stages. Its incidence has been rising steadily, making up around 3 % of all cancers in the United States.[1] The prognosis is generally poor, with a five-year survival rate of about 10 %, primarily due to late-stage diagnosis and limited effective treatment options.[2]

Typically, pancreatic cancer manifests insidiously, with nonspecific symptoms such as abdominal pain, weight loss, jaundice, and digestive issues.[3] Advanced stages might involve metastasis to other organs or structures, resulting in diverse clinical presentations beyond the gastrointestinal tract.[3]

In the realm of pancreatic cancer, our case of metastasis to the pleural effusion as an extra-pancreatic manifestation is notably rare; the incidence is so rare that the exact frequency is unknown.[4] While pancreatic cancer can spread to adjacent organs or lymph nodes, causing symptoms such as jaundice or bowel obstruction, its association with pleural effusion remains an unusual occurrence.[4] This rarity significantly complicates diagnosis, often leading to delayed recognition and management challenges.

2. Case presentation

Our case was a 78-year-old female with a past medical history of gastroesophageal reflux disease (GERD), hyperlipidemia, non-insulin-

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* Corresponding author.
E-mail addresses: Rakahn.Haddadin@hcahealthcare.com (R. Haddadin), Humzah.Iqbal@ucsf.edu (H. Iqbal), daboujam@sgu.edu (D. Aboujamra), George.Trad@hcahealthcare.com (G. Trad), John.Ryan@hcahealthcare.com (J. Ryan), Hatim.Gemil@hcahealthcare.com (H. Gemil).

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dependent diabetes mellitus type 2 (NIDDM2), Chronic obstructive pulmonary disease (COPD) not on home oxygen, history of pulmonary embolism, hypothyroidism, and recently diagnosed pancreatic adenocarcinoma who presented to the emergency department due to worsening of shortness of breath and cough. The patient stated that three months before admission, she started to have a cough with clear sputum.

Blood or black sputum. The patient has also started to experience shortness of breath, which started a month and a half ago. The shortness of breath was worse on exertion and sometimes present at rest. According to the patient, the patient went to urgent care and received a breathing treatment, which did not help. The patient denied any nausea, vomiting, fever, chills, chest pain, or abdominal pain. No chemotherapy or radiation had been started, and the patient was just recently diagnosed two weeks from admission with pancreatic adenocarcinoma.

The patient's vitals on admission were as follows: temperature- 36.8 C, pulse rate − 110 beats/minute, respiratory rate −18 breaths/minute, blood pressure 129/85 mmHg, oxygen saturation - 96 on 2 L nasal cannula.

A Computed tomography (CT; Figs. 1 and 2) of the chest showed no pulmonary embolism, moderate pneumonitis, moderate right pleural effusion, and atrophy of the visible pancreatic tail with ductal dilatation.

A pleural fluid analysis (Table 1) was performed and consistent with exudative per light's criteria. Remarkable lab values for the patient were as follows: total bilirubin of 3.1, Aspartate transaminase (AST) of 162 U/L, Alanine transaminase (ALT) of 120 U/L, total alkaline phosphatase of 844 U/L, lipase of 6 U/L.

Pleural fluid analysis was negative for acid-fast bacilli, fungi and bacteria. Microscopic analysis found that the pleural fluid showed rare malignant cells consistent with adenocarcinoma.

3. Discussion

As observed in this case, the convergence of pancreatic adenocarcinoma and metastasis to the pleura represents a clinical rarity with significant diagnostic and management implications.[5] In the pancreas, both benign and malignant lesions can occur. Of malignant neoplasms, 95 % arise from exocrine elements of the pancreas.[6] The risk factors for pancreatic adenocarcinoma are tobacco, smoking, obesity, alcohol abuse, diabetes mellitus, and chronic pancreatitis.[6] Our patient had a 30-pack-year history, was a social drinker (1−2 drinks a month), and had a BMI of 22. Pancreatic adenocarcinoma typically presents with nonspecific symptoms such as abdominal pain, weight loss, and jaundice, making early detection challenging.[7] In this case, the patient was diagnosed with pancreatic adenocarcinoma, after which she presented with shortness of breath and cough, alongside the development of pleural effusion.

Pleural metastasis in the context of pancreatic adenocarcinoma is an uncommon occurrence, with limited reported cases in the medical literature. Bronchogenic and breast cancer account for 75 % of malignant pleural effusions, with the remaining

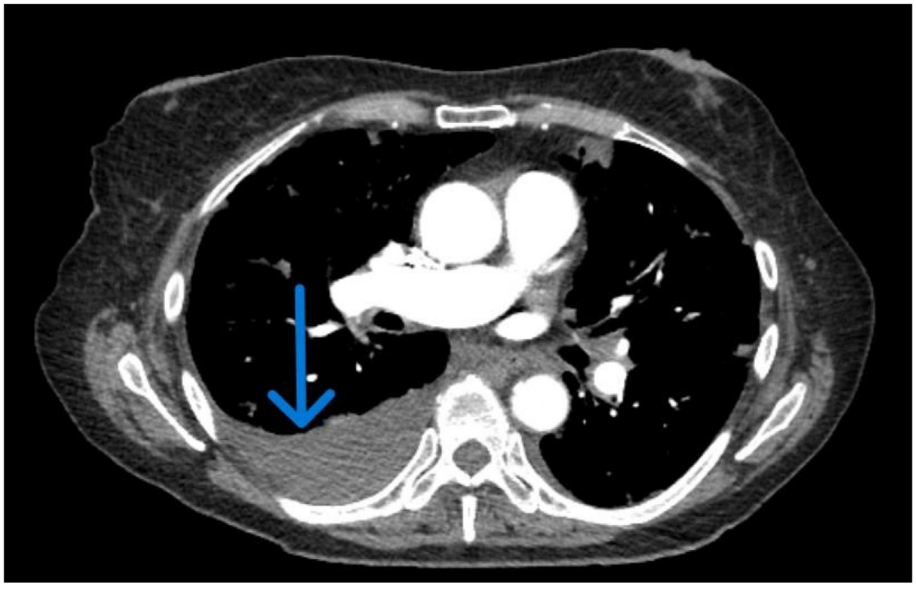

Fig. 1. No pulmonary embolism. Moderate pneumonitis. Moderate right pleural effusion.

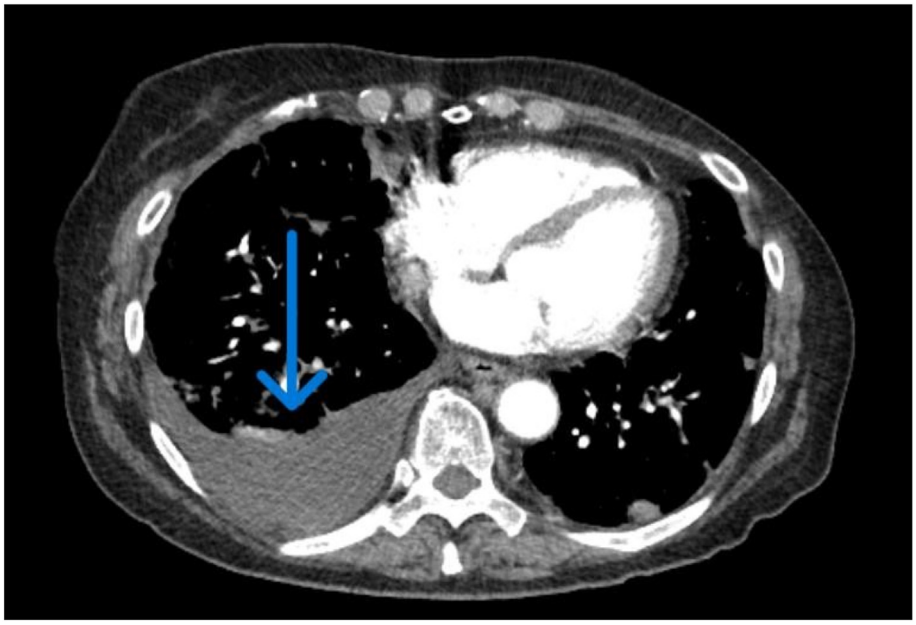

Fig. 2. No pulmonary embolism. Moderate pneumonitis. Moderate right pleural effusion.

25 % represented by a cross-section of other neoplastic diseases.[8] Pleural effusion is a common cause in patients with chronic pancreatitis, with a known incidence of 0.4 %.[9] A further breakdown of the incidence of pleural effusion in chronic pancreatitis shows it occurs primarily in men (90 %) who have a history of alcohol use and present with chest pain and dyspnea.[10] The reported causes of pancreatic pleural effusion are rupture of pancreatic pseudocyst (60 %), pancreatic ducts from chronic pancreatitis (15 %), and pancreatic trauma (10 %).[11] This makes our case extraordinary because we have a female patient with an isolated pleural metastasis from pancreatic adenocarcinoma without any reported history of pancreatitis, pancreatic trauma, or pancreatic pseudocysts.

Table 1. Thoracentesis fluid analysis.

Right Thoracentesis	600 mL
Fluid color	Yellow
Fluid appearance	Hazy (straw coloured)
Fluid pH	8.0 (7.6–7.64)
Fluid WBC	2.341 × 10^3 uL (0.000–0.499)
Fluid RBC	0.003 × 10^6 uL (<0.001)
Fluid granulocytes	55 % (0–24)
Fluid lymphocytes	12 %
Fluid monocytes	30 %
Fluid eosinophils	3 %
Fluid glucose	176 mg/dL
Fluid total protein	3.4 g/dL
Fluid albumin	1.9 g/dL
Fluid lactate dehydrogenase (LDH)	135 IU/L
Fluid amylase	27 IU/L
Fluid triglycerides	19 mg/dL

Note: The patient was treated with doxycycline for possible atypical pneumonia and given budesonide and ipratropium bromide. The patient had an outpatient endoscopic retrograde cholangiopancreatography (ERCP) scheduled for stent placement and was going to have port placement for chemotherapy done later that week. A PET scan was done outpatient to evaluate the potential for any additional metastatic lesions and revealed that the pancreas was positive for hypermetabolic activity without the involvement of any other affected organ.

A literature review below shows eight patients, comprising five men and three women, with a median age of 60.1 (ranging from 37 to 78) years. Dyspnea was reported in 75 % (6 out of 8) cases.[12-18] Our patient was the oldest documented case in the literature.

The underlying mechanisms triggering pleural involvement in pancreatic cancer remain elusive, often leading to delayed recognition and misdiagnosis due to its rarity. In this case, the patient initially presented with classic symptoms of pancreatic adenocarcinoma but later developed respiratory distress and pleural effusion, highlighting the atypical evolution of the disease.

The diagnostic journey necessitated comprehensive investigations, including imaging studies, cytological evaluations of pleural fluid, and multidisciplinary collaboration. Imaging modalities such as CT scans were pivotal in identifying pleural effusion, prompting further exploration to ascertain its association with pancreatic adenocarcinoma.

Treatment decisions in such cases become challenging due to the rarity of this presentation. Treatment options for malignant pleural effusion include therapeutic thoracentesis, pleurodesis,

and, in selected cases, placement of a pleural catheter for drainage. Pleural effusion in pancreatic adenocarcinoma often signifies advanced disease with limited therapeutic options, contributing to a dismal prognosis. In this instance, the focus shifted towards palliative care to alleviate symptoms and enhance the patient's quality of life.

The rarity of this association underscores the importance of vigilant clinical assessment and exhaustive evaluation when confronted with unusual disease presentations. This case report contributes to the limited pool of documented cases, emphasizing the need for increased awareness among healthcare practitioners regarding the potential extra-pancreatic manifestations of pancreatic adenocarcinoma. It also highlights the necessity for continued research to elucidate the mechanisms underlying such rare occurrences and explore potential therapeutic interventions for better disease management.

4. Conclusion

Understanding such atypical presentations for atypical metastasis sites becomes imperative for early detection and tailored treatment strategies. The infrequent correlation between pancreatic cancer and pleural effusion emphasizes the need for heightened clinical suspicion and thorough investigations in cases presenting with unexpected extra-pancreatic complications. Our case report serves as a noteworthy addition to understanding this uncommon presentation, shedding light on the diagnostic complexities and underlining the need for comprehensive evaluation in such scenarios.

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Conflict of interest

The above listed authors, Dr. Haddadin, Dr. Iqbal, Danny Aboujamra, Dr. Trad, and Dr Gemil have no conflicts of interest to declare.

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