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Case Report

Pulmonary Enteric Adenocarcinoma: A Very Rare Case Report from Qatar

Ahmed K. A. Yasin[a] Abdelaziz Mohamed[a] Anas Mohamed[a]
Nusiba Elamin[a] Mustafa A. Al-Tikrity[b] Bara Wazwaz[c]

[a]Department of Internal Medicine, Hamad General Hospital, Hamad Medical Corporation, Doha, Qatar; [b]Department of Pulmonary Medicine, Hamad General Hospital, Hamad Medical Corporation, Doha, Qatar; [c]Department of Pathology, Hamad General Hospital, Hamad Medical Corporation, Doha, Qatar

Keywords
Pulmonary enteric adenocarcinoma · Lung cancer · Immunohistochemistry

Abstract
A 78-year-old male patient presented with dyspnea, loss of appetite, and weight loss. Workup and imaging showed suspected malignant lung lesion. Biopsy was done and showed features of pulmonary enteric adenocarcinoma (PEAC). This is a very rare disease and its diagnosis is challenging.

Introduction

Primary lung cancers are divided into two main groups: small cell lung cancer and non-small cell lung cancer (NSCLC). Pulmonary enteric adenocarcinoma (PEAC) or can be called enteric variant of pulmonary adenocarcinoma is a very rare subtype of NSCLC [1]. The first case of PEAC was identified in 1991 and it was involved in World Health Organization (WHO) classification in 2015 [2].

PEAC is defined as primary adenocarcinoma of the lung that has enteric component exceeds 50% with no evidence of primary colorectal cancer. It shares morphological and immunohistochemical features with colorectal cancer [3]. This makes the diagnosis of PEAC challenging and it needs proper assessment and workup for the patient. Here, we present a new case report of PEAC from Qatar, trying to shed the light on this rare disease.

Correspondence to:
Ahmed K.A. Yasin, ahmadyaseen55@yahoo.com

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Case Presentation

A 78-year-old gentleman, ex-smoker, known case of type 2 diabetes mellitus and hypertension presented to the hospital complaining of shortness of breath for 2 months. The shortness of breath was minimal in the first month but increased in the next month, occurred at rest and not associated with chest pain, orthopnea, paroxysmal nocturnal dyspnea, or other cardiopulmonary symptoms.

Also, he had decrease in appetite and less food intake during the 2 months. Moreover, he mentioned unintentional weight loss of around 5 kg during the same period. He denied hemoptysis, constipation, change in stool color, vomiting, abdominal pain, or any change in bowel habits. Regarding his smoking history, he smoked one pack per day for 30 years then stopped 20 years ago.

Vital signs showed blood pressure 140/83 mm Hg, heart rate 80 beats/min and regular, respiratory rate 23/min, oxygen saturation 97% on room air. On the physical examination, he was conscious oriented, normal chest, abdomen, lower limbs examination. Laboratories were done, shown in Table 1.

Chest X-ray was done and was unremarkable. Computed tomography (CT) scan of chest, abdomen, and pelvis with contrast showed left lung lower lobe peripheral spiculated mass measuring 3.7 × 2.8 × 2.5 cm with internal specks of calcification and tiny focus of lucency/cavitation, highly suspicious for malignancy. In addition to scattered foci of increased enhancement in the liver, lung lesion is shown in Figures 1 and 2.

CT-guided biopsy of left lower lobe lesion was done by interventional radiology. Biopsy showed two cores of pulmonary parenchyma that were replaced by glandular tumor characterized by glandular structures lined by columnar epithelium with occasional cytoplasmic mucin vacuoles, goblet cells, and luminal necrosis (shown in Fig. 3). By immunohistochemical staining, the tumor cells were positive with cytokeratin (CK) 7, CK 8/18, CK 19, CK 20, MOC-31, and focally positive with caudal type homeobox 2 (CDX2) (shown in Fig. 4); while negative with special AT-rich sequence-binding protein 2, thyroid transcription factor-1, Napsin-A, and ALK5 A4. So, diagnosis of moderately differentiated enteric variant of pulmonary adenocarcinoma was made as enteric components were more than 50%. MMR mutations are observed frequently in this kind of cancer; however, no MMR mutation was detected by immunohistochemistry in this case.

Further workup to rule out other primary tumors was done: upper and lower gastrointestinal endoscopies were done and showed normal findings. Magnetic resonant imaging for abdomen was done and showed same CT findings, no other lesions. Positron emission tomography scan was done and showed left lower lobe lung mass with moderate fluorodeoxyglucose uptake suspicious of malignant lesion with no obvious nodal involvement or distant metastatic disease. Oncology team was involved and planned to continue workup and start treatment but patient refused and travelled abroad to continue management.

Discussion

PEAC is a very rare disease. The incidence of PEAC is unknown and about 347 cases have been found in the literature up to now, mainly as case reports or small case series [4].

Due to rarity of this disease and similarity with metastatic colorectal cancer (MCC), clinical and radiological assessment should be done carefully to rule out metastasis from colorectal source [5]. This includes appropriate history, physical examination, chest X-ray, CT of chest, and abdomen in addition to gastrointestinal endoscopies and positron emission

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Table 1. Laboratory tests results

Laboratory	Result	Reference range
White blood cells × 10^3/μL	5.4	4.0–10.0
Hemoglobin, gm/dL	11.6	12.0–15.0
Platelets × 10^3/μL	345	150–400
Prothrombin time, s	10.9	9.7–11.8
Partial thromboplastin time, s	25.1	24.6–31.2
International normalized ratio	1	NA
Sodium, mmol/L	133	133–146
Potassium, mmol/L	3.8	3.5–5.3
Adjusted calcium, mmol/L	2.28	2.20–2.60
Phosphorus, mmol/L	0.87	0.80–1.50
Magnesium, mmol/L	0.72	0.70–1.00
Creatinine, μmol/L	71	44–80
Urea, mmol/L	2.4	2.5–7.8
Alanine transaminase (ALT), U/L	10	0–33
Aspartate transaminase (AST), U/L	11	0–32
Iron, μmol/L	9	6–35
Ferritin, μg/L	11.4	18–340
Total iron binding capacity, μmol/L	80	45–80
Transferrin, gm/L	3.2	2.0–3.6
Iron saturation, %	11	15–45
B12, pmol/L	414	145–596
C-reactive protein, mg/L	0.6	0.0–5.0

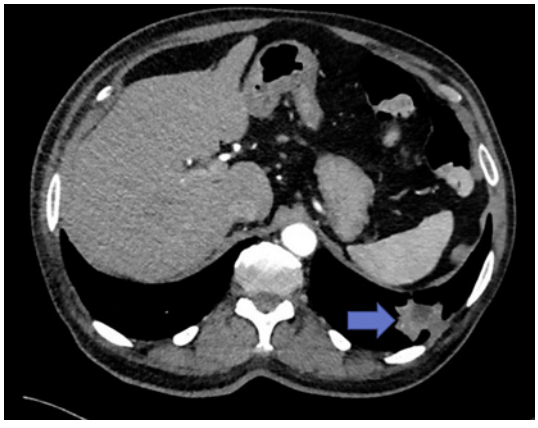

Fig. 1. CT chest (mediastinal window) showed left lower lobe mass (blue arrow).

tomography scan. As PEAC is a very rare disease, the prognosis could not be determined but in some studies, the 5-year survival rate was very low in most of the cases [6, 7].

Histologically and immunohistochemically speaking, both PEAC and MCC show columnar cells with eosinophilic cytoplasm, formed into irregularly shaped glands with necrotic material. Both variants may be positive for intestinal markers (CDX2, CK20, and Villin) and

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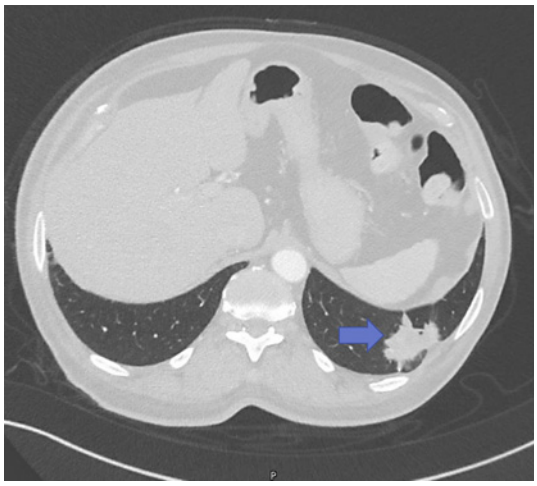

Fig. 2. CT chest (lung window) showed left lower lobe mass (blue arrow).

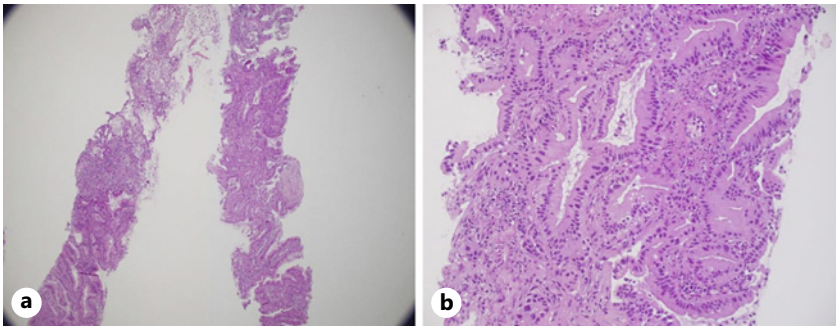

Fig. 3. Core biopsies showing the tumor with glandular architecture (H&E stain, power of magnification ×100 (**a**) and 200 (**b**)).

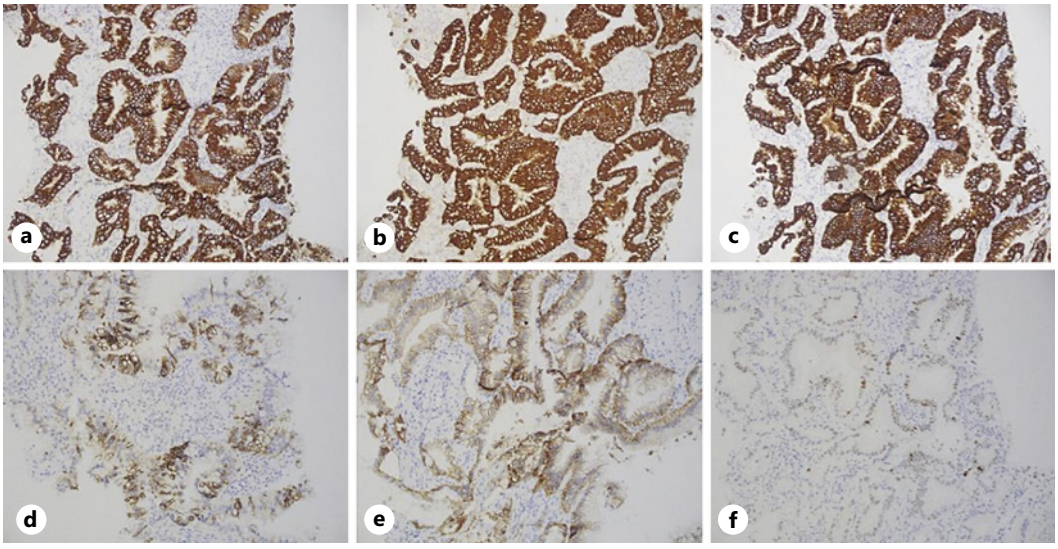

Fig. 4. Immunohistochemistry staining pattern of the tumor: **a**: cytokeratin (CK) 7, **b**: CK 8/18, **c**: CK 19, **d**: CK 20, **e**: MOC-31, and **f**: caudal type homeobox 2 (CDX2).

negative or only focal and weakly positive for pneumocyte markers (thyroid transcription factor-1 and Napsin-A) [8]. And this applies to our case as noticed.

Regarding treatment, surgery is the preferred first-line approach for resectable tumors. But in non-resectable tumors and advanced disease, the choice of systemic treatments is controversial [9]. Some clinicians use platinum-based chemotherapy with taxane as usually done in NSCLC patients, while others use chemotherapy regimens adopted for treating colorectal cancers, such as oxaliplatin, 5-fluorouracil, or irinotecan [10].

Immunotherapy with checkpoint inhibitors has also been described in the treatment of PEAC. However, due to the rarity of this cancer there are no clear guidelines for management for this disease [10, 11].

Conclusion

PEAC is a very rare disease that is very similar morphologically and immunohistochemically to metastatic colorectal cancer, so careful clinical and radiological assessment of the patient should be done as proper diagnosis will lead to a proper management. The CARE Checklist has been completed by the authors for this case report, attached as online supplementary material (for all online suppl. material, see https://doi.org/10.1159/000533220).

Statement of Ethics

This case report complies with the Declaration of Helsinki and has been approved by the Ethics Committee of Hamad Medical Corporation. This study protocol was reviewed and approved by Medical Research Center in Hamad Medical Corporation, approval number (MRC-04-23-424). Written informed consent was obtained from the patient for publication of this case report and any accompanying images.

Conflict of Interest Statement

The authors have no conflicts of interest to declare.

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Author Contributions

Study design and conception: Ahmed K. A. Yasin. Acquisition, analysis, or interpretation of data: Abdelaziz Mohamed. Drafting of the manuscript: Anas Mohamed. Critical revision of the manuscript for important intellectual content: Nusiba Elamin. Supervision: Mustafa Al-Tikrity and Bara' Wazwaz.

Data Availability Statement

All data generated or analyzed during this study are included in this article and its online supplementary material. Further inquiries can be directed to the corresponding author.

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