Hong Kong College of Physicians
Case Report for Interim Assessment
Specialty Board of Advanced Internal Medicine (AIM)

Name of candidate (print and sign):
Hospital and Unit: Medicine Specialty other than AIM:
Name of supervisor (print and sign):
Date(s) and place (hospital) of patient encounter: April 2020
Date of report submission: March 2022

Case report

Title: A middle aged lady with haemoptysis

Case history:

Ms. Fong was a 53-year-old woman. She had a past medical history of hypertension and was taking Amlodipine 10mg daily. She was a non-smoker and non-drinker. There was no history of illicit drug abuse. Her family history was unremarkable.

She attended the Accident and Emergency Department for a three-month history of dry cough and one-month history of blood stained sputum. She denied shortness of breath, reduced exercise tolerance nor chest pain. She recalled no fever, weight loss nor constitutional symptoms. There were no other bleeding symptoms nor skin rash.

Ms. Fong was afebrile with stable vital signs. Her peripheral oxygen saturation (SpO2) was 98% in room air. She has no palpable cervical lymph nodes. There was bilateral fine inspiratory crepitations on auscultation. The rest of the examination was unremarkable.

A chest X-ray (CXR) was performed and showed infiltrates over bilateral lower zones. A panel of blood tests, including complete blood count, electrolytes, liver and renal function tests, were unremarkable except mild thrombocytosis (platelet count 391×10^9/L). Sputum tests, including sputum culture, Acid Fast Bacillus smear and culture, cytology, were all negative. A contrast computed tomography (CT) of thorax was performed and showed airspace and ground-glass densities distributed in bilateral lungs, more prominent at the periphery and right lung base. Bronchoscopy was performed, in which no endobronchial lesions nor bleeding was noted. Bronchial aspirate, bronchial alveolar lavage culture and cytology were all negative. Transbronchial lung biopsies of lateral basal and posterior basal segment of right lobe did not show any significant pathologies.

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A course of Amoxicillin and Clavulanate and Doxycyclin was given with symptoms temporarily subsided, so she was discharged.

A follow-up contrast CT thorax performed 5 months later showed massive pulmonary embolism (PE) with thrombus in bilateral main pulmonary trunk as well as a nodular opacity of indeterminate nature in right upper lobe (1.08 x 1.05 x 0.92cm). Subsequent workup failed to reveal any potential risk factors for PE, namely tumor markers (alpha fetal protein, carcinoembryonic antigen, cancer antigen 125), thrombophilia screening (anti-Cardiolipin, Lupus Anticoagulant, anti-thrombin, Protein C and Protein S) and doppler ultrasonography of bilateral lower extremities. Neither oral contraceptive pills nor hormonal replacement therapy she was taken.

She was put on Apixaban. Despite a 1-year course of treatment with good drug compliance, there was progression of bilateral PE on her follow-up scan, with new pulmonary masses formation, the largest one measured up to 5cm. CT guided fine needle aspiration cytology (FNAC) of the largest lung mass was performed twice. First attempt yielded some atypical cells only, while the second attempt confirmed malignant spindle cell neoplasm.

Her symptoms progressed one week later with worsening haemoptysis and shortness of breath. A whole-body CT scan was performed for malignancy staging. It showed extensive lesions with heterogeneous enhancement in the pulmonary arteries, with invasion into the mediastinum with partial compression on superior vena cava (Figure 1 & 2). A large pleural/lung mass at right hemithorax, as well as multiple masses over bilateral lungs, spleen, right adrenal glands and brain, were suggestive of metastases. With the correlation of the histological findings, the diagnosis of pulmonary artery intimal sarcoma (PAIS) was established.

Despite urgent chemotherapy with Paclitaxel was started, her breathlessness worsened and CXR showed enlarging lung masses. After discussion with patient and her family members, comfort care was offered and she eventually succumbed one year after symptoms onset.

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Discussion and literature review:

Pulmonary artery intimal sarcoma (PAIS) is an extremely rare pulmonary malignancy. The incidence of PAIS is about 0.001–0.003%. It was first reported by Mandelstamml in autopsy [1]. It is male predominant (4–5:1) [2]. The disease can occur in varied age groups, with the youngest being 2 months old, the oldest being 89 years old. The average age is about 45–54 years old [1]. Causes of the disease are not yet known but smoking is found to be a major risk factor. Other risk factors include history of exposure to radon, prolonged exposure to asbestos and other harmful chemicals (arsenic, chromium, nickel, and tar), chromosomal anomalies and mutations on gene TP53 [2].

Chest discomfort and shortness of breath are the most common presenting symptoms. Other non-specific symptoms include fatigue, fever, weight loss, and appetite loss [3]. Various imaging modalities, including CXR, CT, MRI and PET-CT, can aid the diagnosis of PAIS.

The presentation of PAIS usually mimic thromboembolic disease, leading to diagnostic delays. Nevertheless, there are certain clinical features that may raise clinical suspicion. A retrospective study has shown that patients with PAIS are usually younger than those with PE, with a mean age of 54 years-old and 64 years-old respectively. Another clinical clue was the duration of symptoms onset, which is significantly shorter in patients with PAIS than those with PE (3 months vs 6 months respectively). Moreover, half of the patients with PE have had deep vein thrombosis while it is very rare in patients with PAIS[4].

There are also difficulties in distinguishing PAIS from PE by imaging studies, nevertheless certain radiologic features could make one more likely. Both PAIS and PE show enhancement on CT pulmonary arteries images, however PAIS is more often unilateral and centrally located. The size of the filling defect in PAIS is usually greater than that in PE, causing enlarged pulmonary artery [5]. As seen in our patient, heterogenous densities within the filling defect is another characteristic of PAIS, they may represent haemorrhage, necrosis, or ossification of the tumor[6]. PET-CT with fluorodeoxyglucose (FDG) can aid in the diagnosis of PAIS by assessing the increased uptake at the level of the tumor filling defects. However, equivocal results were also reported in literature[7]. The diagnosis of PAIS can only be confirmed with histopathology. Immunohistochemical study of MDM2 of the neoplastic cells is positive in most cases [8].

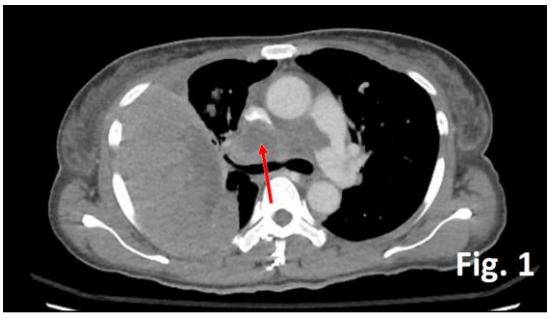
Regarding the treatment of PAIS, surgical resection of the primary tumor is the best therapeutic option to improve survival in a surgical-feasible candidate. Adjuvant chemotherapy and radiotherapy have limited roles. Partial resection may be considered for some patients with metastasis. Otherwise, treatment is generally systemic and palliative in nature [9].

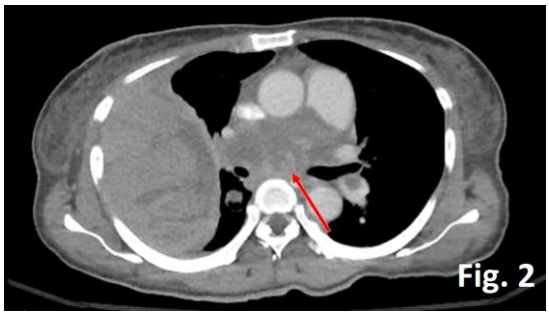
The prognosis of PAIS is very poor. For those with unresectable or metastasized tumour, the median survival was a month and a half only. With the use of

chemotherapy and advances in radiation therapy, the survival in patients with advanced PAIS has improved tremendously, ranging from 8 to 17 months. The use of radiation therapy and chemotherapy after surgical treatment has also been found to prolong the survival, compared with surgery alone [10].

In conclusion, PAIS is a rare and aggressive malignancy. It is a diagnosis in disguise and is often mistaken as PE. Due to the high mortality, therapeutic and prognostic implications, it is of paramount importance for clinicians to be aware of its key features differentiating from PE. Pathological diagnosis is the ultimate step to confirm the diagnosis.

Tables and figures





CT scan with contrast demonstrating (Fig.1) the pulmonary artery tumor invaded into the mediastinum causing partial compression of the SVC; (Fig. 2) filling defect with heterogeneous enhancement.

References:

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No of words in Case History and Discussion (excluding references): 1598 words

Declaration

I hereby declare that the case report submitted represents my own work and adheres to the prescribed format. I have been in clinical contact with the case selected. The case report has not been submitted to any assessment board or publication and it is NOT related to my second specialty(ies), if any. My consent is hereby given to the College to keep a copy of my case report, in written and/or electronic, at the College Secretariat and allow the public to have free access to the work for reference.

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(signature of Trainee)

Endorsed by Supervisor *

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(signature of Supervisor)

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