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Case report

A rare case of lung adenocarcinoma mimicking a primary pleural tumor ☆☆☆

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ABSTRACT

Most pleural masses are metastatic tumors from other locations; however, some tumors arise primarily from the pleura, albeit rare. Both primary and metastatic pleural tumors may present similar radiological features, which could lead to a misdiagnosis. We aimed to report a fifty-one-year-old Indonesian male with a lung adenocarcinoma mimicking a primary pleural tumor.

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A pleural tumor is a type of mass found in the pleural space or cavity, located in the space between the lungs and thoracic wall. The prevalence of pleural pathologies is still unclear based on the latest literature. Most pleural masses are metastatic tumors from the thorax or other locations; however, there are tumors arising primarily from the pleura [1]. The most common type of primary pleural tumor is mesothelioma. These tumors are rare, accounting for only five percent of all pleural mass cases [2]. Despite the different histogenetic

pathways, both primary and metastatic pleural tumors have similar clinical and radiological features, leading to a misdiagnosis.

In some cases, missed diagnoses may occur. Approaches based on clinical and radiographic imaging are mandatory to differentiate pleural masses [3]. We report a 55-year-old patient with a lung adenocarcinoma mimicking a primary pleural tumor. This case has been reported following the CARE guidelines for writing a case report [4].

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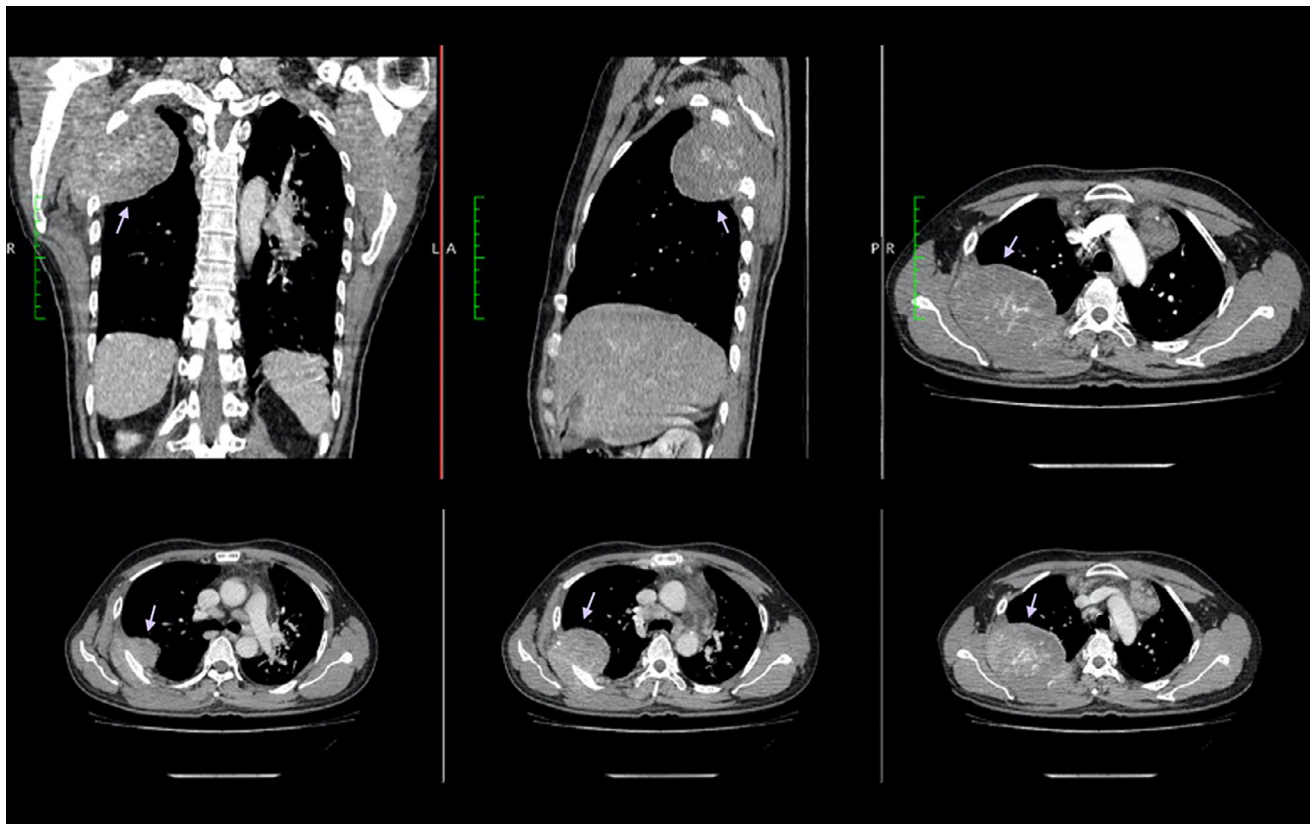


Fig. 1 – Contrast-enhanced CT-scan images of the chest region, showing a heterogeneously enhanced mass, suggestive of a pleural tumor with multiple lymphadenopathies (white arrow). The mass appears to arise from the pleura without any lesions or nodules in the lungs (white arrow).

Case presentation

A 55-year-old male came with complaints of shortness of breath, right chest pain, and weight loss. The symptoms had occurred for a few months and gradually worsened. He had a history of smoking approximately two packs a day but no history of asbestos exposure to his knowledge. Physical examination showed signs of respiratory distress from his breathing rate and chest examination. Other vital signs were within normal limits. Physical signs and laboratory results were unrevealing as to the cause of his ailment.

Investigations/Imaging findings

Initial Computed Tomography (CT)-Scan examination of the chest revealed a solid mass in the pleural cavity (40 Hounsfield units) measuring approximately $7.2 \times 8.8 \times 5.2$ cm in size. A contrast-enhanced CT-Scan evaluation showed a heterogeneously enhancing mass (72–90 Hounsfield units) and destruction of the right rib from posterior to lateral with multiple lymphadenopathies in the perivascular, left peribronchial, right lower paratracheal, and left supraclavicular lymph nodes, as shown in [Figure 1](#). No lesions or nodules were apparent in the lungs. The mass appeared to be isolated in the pleural cavity,

indicating a suspicion toward primary mesothelioma. A pleural core biopsy was performed afterward, which resulted in adenocarcinoma based on immunohistochemical (IHC) findings in [Figure 2](#).

Differential diagnosis

Initial CT-Scan findings led to the suspicion of a primary pleural mass. However, further histopathological investigation using IHC staining revealed that the mass was an adenocarcinoma instead of the initially suspected primary mesothelioma.

Treatment

The patient was planned for a Pemetrexed, and Cisplatin based chemotherapy. A posteroanterior and a lateral view chest X-Ray (CXR) examination was performed, showing a pleural tumor, destruction of the 3rd and 4th ribs, pneumonia, and cardiomegaly, as shown in [Figure 3](#). A skeletal survey in [Figure 4](#) was performed afterward, showing no signs of metastatic process on visualized bones.

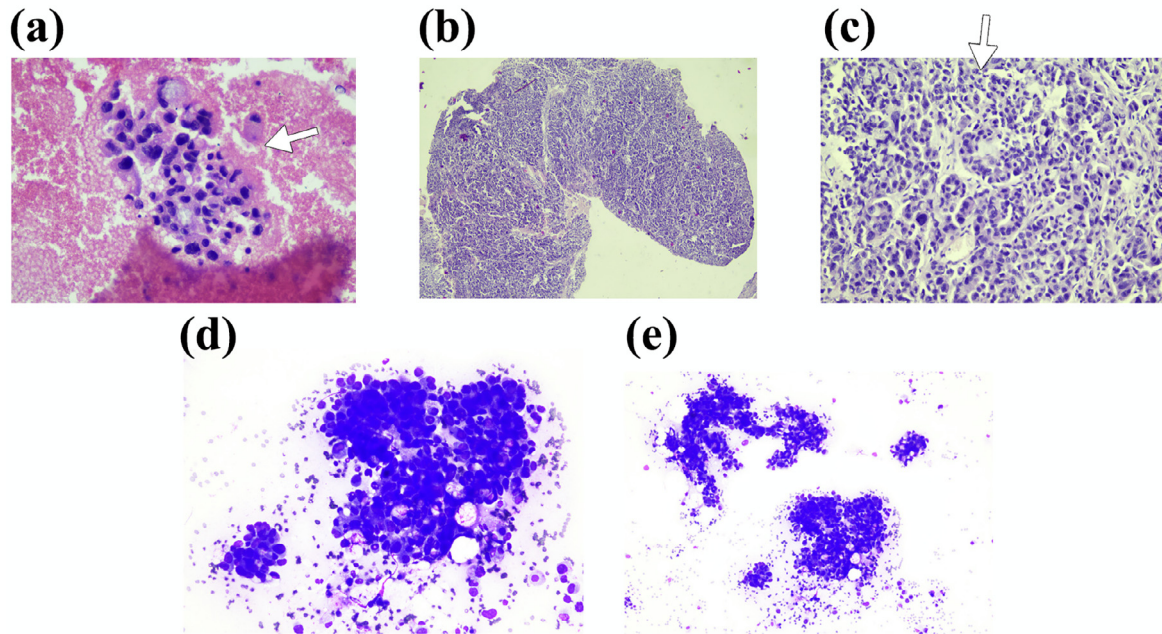


Fig. 2 – (A, B, C) Histopathology images of the pleural biopsy specimen showing round to oval cells with pleomorphic and coarse chromatin nuclei (white arrows), **(D, E)** IHC staining results were positive for TTF-1 and Napsin A markers, suggesting an adenocarcinoma of the lung.

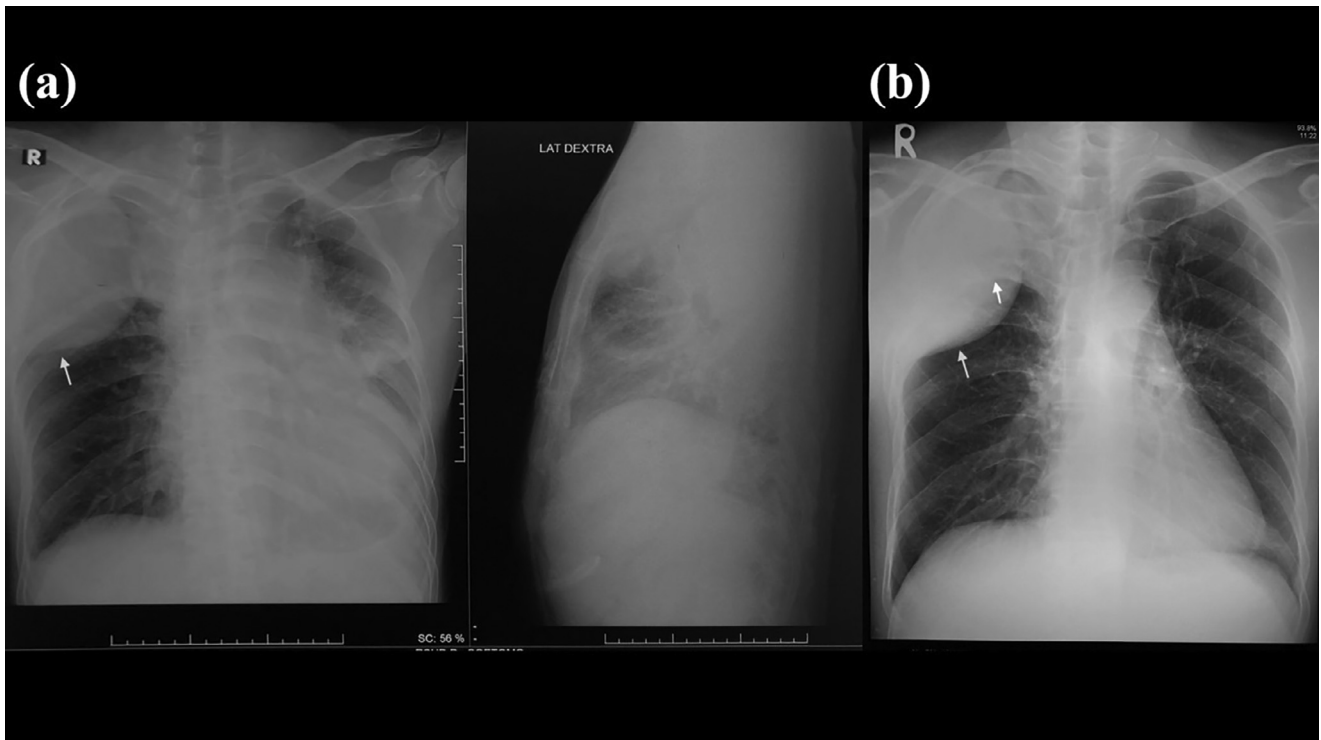


Fig. 3 – (A) CXR images indicating a tumor in the pleural cavity with the destruction of the 3rd and 4th ribs, pneumonia, and cardiomegaly, **(B)** CXR images during a 3-mo follow-up showing evidence of disease progression: pleural mass appears to be larger than previously with signs of atelectasis and an additional 5th rib destruction (white arrow).



Fig. 4 – Skeletal survey did not show any signs of metastatic process on visualized bones.

Outcome and follow-up

The patient came to continue his chemotherapy cycle and underwent a chest radiograph and second skeletal survey three months after his last visit. Compared to the previous CXR results, the right pleural mass was larger than before. There were also signs of atelectasis, 5th rib destruction, and a prominent cardiac. The skeletal survey did not indicate any signs of the metastatic process of the visualized bones. Unfortunately, the patient was lost to follow-up after his last visit. Before the patient was lost to follow-up, he had completed four cycles of chemotherapy.

Discussion

Literature review

Primary pleural tumors, such as mesothelioma, are exceedingly rare and challenging not only for physicians to manage but also for radiologists and pathologists to diagnose and help decide the proper management. Clinically, the presentations of a pleural mass vary from case to case. Most patients remain asymptomatic and are diagnosed incidentally from a CXR or CT-Scan examination. In some cases, the tumor may cause

compression symptoms, depending on the site and size of the mass [5]. Various imaging modalities are currently available for use in the evaluation of pleural masses. Ultrasonography, CXR, CT-Scan, Magnetic resonance imaging, Positron emission tomography (PET), or PET-CT are modalities that can help characterize the tumors to support further interventions [6]. However, chest CT-scan is still the primary imaging modality for evaluating pleural mass [7]. One of the signs of pleural tumors is the incomplete border sign, by which part of the border is invisible and only a portion of the margin of mass is apparent [1].

Patient findings compared to literature

The mass, in this case, was initially believed to be a primary pleural tumor. The patient complained of shortness of breath and right chest pain, possibly due to the tumor's compression on the right lung. Even though many pathologies may imitate this tumor's findings from imaging evaluations, a proper multimodality imaging approach promises survival benefits.

In this case, chest CT showed a malignant solid pleural mass (40 Hounsfield units), arising from the pleura with an obtuse angle with the chest wall. These findings suggested that the mass was originated from the pleura. However, the histopathological and IHC results suggested differently. The histopathological appearance of the tissue and the positive staining results of TTF-1 and Napsin A markers indicated that

the tumor is a primary adenocarcinoma of the lung [8]. Based on these findings, the diagnosis led to a microtumor of the lung that is underlying right above the pleura, which metastasis invading the pleura originating from adenocarcinoma of the lung. A similar case was reported from Japan discussing a 58-year-old patient with localized pleural adenocarcinoma similar to a primary pleural tumor [9]. The imaging results indicated that the primary tumor was located in the pleural cavity. Based on the IHC examination, the patient was diagnosed with pseudomesotheliomatous adenocarcinoma. Lung cancer itself often involves the pleura within the progression of the disease. Lung adenocarcinoma has the highest prevalence compared to other subtypes with overlapping clinical and radiological features. Metastatic pleural tumors may develop from the pleura's direct contact with malignant tissue pressing in from the lungs [10]. A similar case has not been reported elsewhere in Indonesia. During the follow-up sessions, the patient's condition seemed to worsen despite being given chemotherapy.

Limitations and suggestions

A comprehensive evaluation using a PET Scan could not be performed as it is unavailable in our center. Unfortunately, the patient was lost to follow-up. Even with imaging modalities, often it may be difficult to distinguish malignant mesothelioma from a metastatic pleural mass. A thorough history taking supported by a pathological examination in malignancies with similar characteristics is necessary to prevent a misdiagnosis. Additionally, the negligence of performing a comprehensive and systematic examination could lead to a missed diagnosis of malignancies coexisting with other pathologies with a similar appearance based on several imaging modalities.

Conclusion

This case emphasizes a rare lung adenocarcinoma phenomenon initially believed to be a primary pleural tumor and highlights the necessity to rely on complete clinical history, comprehensive imaging, and histopathological results for a pleural mass.

Author contributions

RSK, YPK, and FH contributed equally to this article. All authors have read the manuscript and agreed to the contents.

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Patient consent and ethical approval

Informed consent for patient information to be published in this article was obtained. Appropriate informed consent was obtained for the publication of this case report and accompanying images. This report has been approved by the ethical committee of Dr. Soetomo General-Academic Hospital (Letter of Exemption 0771/118/VI/2021).

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