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MALIGNANT PLEURAL MESOTHELIOMA: A RARE CASE REPORT

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Abstract

Background: Malignant pleural mesothelioma (MPM) is a rare and aggressive cancer primarily linked to asbestos exposure. Diagnosis remains challenging, particularly in resource-limited settings where imaging and histopathology services are constrained.

Case Presentation: A 60-year-old male presented to Ali Abad Teaching Hospital, Kabul, with a one-month history of progressive dyspnoea and cough. Initial evaluation revealed left-sided pleural effusion, initially managed as tuberculosis and bacterial infection due to nonspecific fluid analysis. Persistent effusion on follow-up prompted CT imaging, which identified a 5 cm pleural mass suspicious for MPM. Diagnostic limitations prevented confirmatory biopsy, leading to referral for specialized oncology care.

Conclusion: High clinical suspicion for MPM is warranted in refractory pleural effusions, even without known asbestos exposure. Enhanced diagnostic pathways, accessible immunohistochemistry, and multidisciplinary collaboration are urgently needed in resource-constrained regions to improve outcomes for this lethal malignancy.

Keywords: Malignant pleural mesothelioma, Afghanistan, Kabul, diagnostic challenge, pleural effusion.

Introduction

Malignant pleural mesothelioma (MPM) is a rare and aggressive malignancy arising from the mesothelial cells lining the pleura, primarily associated with asbestos exposure [2]. The disease has a long latency period, often presenting 20-50 years after initial exposure, and carries a poor prognosis, with a median survival of 8-14 months following diagnosis [8]. Despite global regulations restricting asbestos use, mesothelioma remains a significant occupational health concern, particularly in regions with ongoing asbestos exposure or inadequate workplace safety measures [3].

The diagnosis of MPM is challenging due to its nonspecific clinical presentation, which often includes dyspnoea, chest pain, and pleural effusion [7]. Imaging modalities such as computed tomography (CT) and positron emission tomography (PET) aid in disease assessment, but definitive diagnosis requires histopathological examination, often obtained via thoracoscopic biopsy [4]. Immunohistochemical markers, including calretinin, WT1, and D2-40, are essential in distinguishing mesothelioma from metastatic adenocarcinoma [5].

Treatment options for MPM remain limited, with multimodal approaches incorporating surgery, chemotherapy, and radiation therapy offering modest survival benefits [9]. Recent advances in immunotherapy, particularly immune checkpoint inhibitors, have shown promise in improving outcomes for some patients [1]. However, access to advanced therapies is often restricted in low-resource settings, including Afghanistan, where diagnostic and treatment capabilities may be limited.

This case report presents a patient diagnosed with malignant pleural mesothelioma at Ali Abad Teaching Hospital in Kabul, Afghanistan. This highlighted the diagnostic challenges, management strategies, and outcomes in a resource-constrained environment. The case underscores the need for increased awareness, early detection, and improved access to specialized care for mesothelioma in regions with limited healthcare infrastructure.

Case Presentation

A 60-year-old patient presented to the Cardio-Respiratory Department of Ali Abad Teaching Hospital on 17 December 2024 with complaints of persistent cough and shortness of breath, ongoing for more than a month. The patient was admitted for further evaluation. Upon admission, a comprehensive physical examination was performed, including inspection, palpation, percussion, and auscultation. It was noted that breath sounds were absent on the left side of the chest. A chest radiograph was ordered, which revealed a massive pleural effusion.

Subsequently, one liter of pleural fluid was drained and sent to the laboratory for cytological, biochemical, and microbiological analysis. The fluid appeared turbid on visual inspection. Laboratory findings showed exudative pleural effusion: protein level at 4 g/dL, LDH 400 U/L, glucose at 80 mg/dL, and a white blood cell count of 1000/µL.

Following these results, an additional sample was collected and sent for culture. The report showed no bacterial growth and was negative for tuberculosis. At this point, the patient was started on intravenous ceftriaxone, 1 gram every 12 hours for 10 days.

After two days, a follow-up assessment still indicated the presence of pleural effusion. A chest CT scan was recommended, which confirmed a massive pleural effusion and suggested further imaging. Based on clinical findings, anti-tuberculosis therapy was initiated. The patient was asked to return for follow-up after one month. Upon re-evaluation with physical examination and ultrasonography, pleural effusion was still present.

The patient underwent another CT scan, which revealed a 5 cm mass in the middle lobe of the left lung, highly suggestive of malignant pleural mesothelioma, a rare cancer originating from the mesothelial cells lining the pleura. Due to a lack of resources, a biopsy was not performed.

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The patient was referred to the oncology ward of Ali Abad Teaching Hospital for further evaluation, biopsy if feasible, and definitive treatment planning.

Discussion

Malignant pleural mesothelioma (MPM) is a rare and aggressive malignancy with a strong association with asbestos exposure, though sporadic cases occur without known exposure [2]. This case highlights the diagnostic challenges of MPM, particularly in resource-limited settings like Afghanistan, where advanced imaging and histopathological confirmation may be delayed. The patient has a long history of working as a farmer and may be exposed to different kinds of dust, especially asbestos.

Diagnostic Challenges: The patient initially presented with pleural effusion, a common but nonspecific finding in MPM [7]. The low protein and LDH levels in the pleural fluid initially suggested a transudate effusion, which is atypical for MPM (where exudative effusions are more common) [6]. This discrepancy may have contributed to the initial misdiagnosis and empirical treatment with antibiotics and anti-TB therapy.

The CT findings of a pleural mass and nodular thickening later raised suspicion for MPM. However, the patchy pleural involvement posed a risk of false-negative biopsy results, a well-documented challenge in MPM diagnosis [4]. Immunohistochemistry, e.g., calretinin, WT1, D2-40, is essential for definitive diagnosis {5}, but access to such testing may be limited in Afghanistan.

Management Considerations: Given the poor prognosis of MPM (median survival 8–14 months) [8], early referral to oncology was appropriate. Multimodal therapy (surgery, chemotherapy, and radiation) offers the best survival benefit in resectable cases [9. However, in advanced or unresectable disease, palliative approaches, such as pleurodesis, symptom control, and immunotherapy (nivolumab/ipilimumab) may be considered [1].

Limitations in Resource-Constrained Settings

This case underscores the barriers to MPM management in low-resource settings, including:

1. Delayed diagnosis due to nonspecific symptoms and limited imaging.
2. Lack of specialized pathology for immunohistochemical confirmation.
3. Limited access to advanced therapies (e.g., immunotherapy, radical surgery).

Conclusion

High clinical suspicion for MPM is warranted in refractory pleural effusions, even without known asbestos exposure. This case highlights the importance of early suspicion for MPM in patients with recurrent, unexplained pleural effusions, particularly in regions with limited resource settings. Improved diagnostic protocols, biopsy accessibility, and oncologic collaboration are needed to enhance outcomes in similar settings.

Ethical consideration: The study was conducted in accordance with ethical standards and guidelines. Written informed consent was obtained from the patient for the publication of this case report. Patient anonymity has been preserved throughout to protect privacy.

Conflict of interest: The author has no conflicts of interest.

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