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Pulmonary Mucormycosis with Chest Wall Involvement: An Uncommon Presentation

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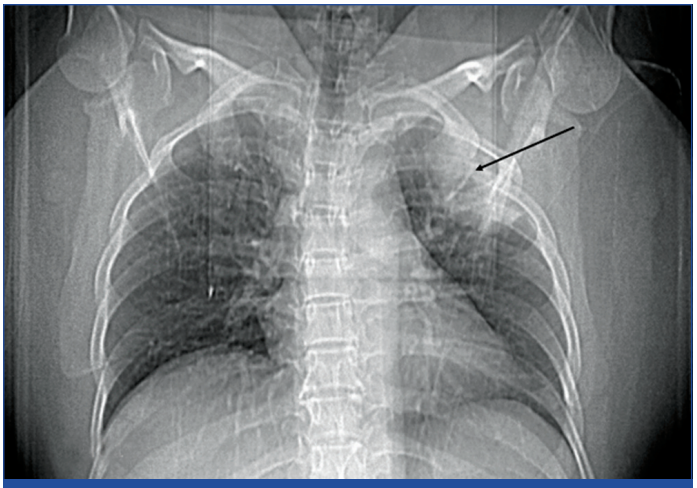
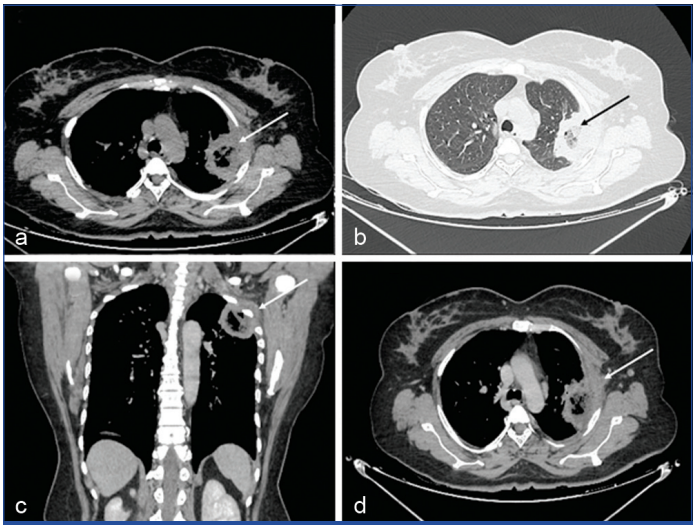
A 47-year-old female, presented with chief complaints of left-sided chest pain for the last 15 days, with pain radiating to the left shoulder, accompanied by shoulder numbness. The patient also reported cough with brown-coloured expectoration, shortness of breath, and unilateral sweating of the left side of the face for one week. There was a history of fever without chills or evening rise of temperature for two days and an unintentional weight loss of 15 kg in the past six months. There was no loss of appetite and no prior history of tuberculosis, chronic respiratory disease or anti-tubercular treatment. The patient gave a history of biomass exposure for five years and is a known case of uncontrolled type 2 diabetes mellitus. On general examination, patient was conscious and oriented. The pulse rate was 110 per minute, blood pressure measured 120/80 mmHg, respiratory rate was 20 per minute, and oxygen saturation was 98% on room air. The patient was afebrile at presentation. Systemic examination revealed bilateral air entry with normal vesicular breath sounds. Cardiovascular, abdominal and neurological examinations were unremarkable. On laboratory evaluation, the patient's random blood glucose was 558 mg/dL, Glycosylated Haemoglobin (HbA1c) was 14.4%, and the total white blood cell count was 11,500/ cu.mm, International Normalised Ratio (INR) was 0.94, and Erythrocyte Sedimentation Rate (ESR) was 47 mm/hour. The patient had undergone an MRI of the cervical spine at an outside hospital for shoulder pain and numbness. Incidentally, a large mass measuring 4.7×4.8 cm was noted in the left upper lobe close to the lateral chest wall. Further evaluation with contrast-enhanced CT chest at our institute was done. CT topogram showed a mass in the left upper zone [Table/Fig-1]. Contrast enhanced CT showed a lesion measuring 6.2×4.5×4.3 cm in the apicoposterior segment of the left upper lobe with a central area of ground-glass opacity and surrounding consolidation, which is called the reverse halo sign [Table/Fig-2a,b]. The lesion showed a broad-based attachment to the pleura with extension across the left first and second intercostal spaces into the chest wall. No definite rib erosion was noted [Table/Fig-2c,d]. Possibility of an atypical fungal infection was considered, although neoplastic aetiology was a differential diagnosis in view of chest wall involvement. A CT-guided biopsy [Table/Fig-3] from the lesion was performed, which revealed skeletal muscle necrosis with granulation tissue and fungal organisms morphologically compatible with mucormycosis. Bacterial and mycobacterial cultures were negative. With these findings, a diagnosis of pulmonary mucormycosis of the left upper lobe with chest wall extension was established in the background of uncontrolled diabetes mellitus. The patient was admitted under the pulmonology department and started on supportive management with intravenous antibiotics, analgesics, and diabetic control. Antifungal therapy with liposomal amphotericin B was strongly advised; however, the patient's attendants declined initiation of therapy due to logistic reasons. Surgical management with left upper lobectomy was also suggested by cardiothoracic surgical consultation, but was refused by the patient's family. The patient was therefore discharged at the patient's request for further management at a government hospital after detailed counselling regarding the risks and potential complications.

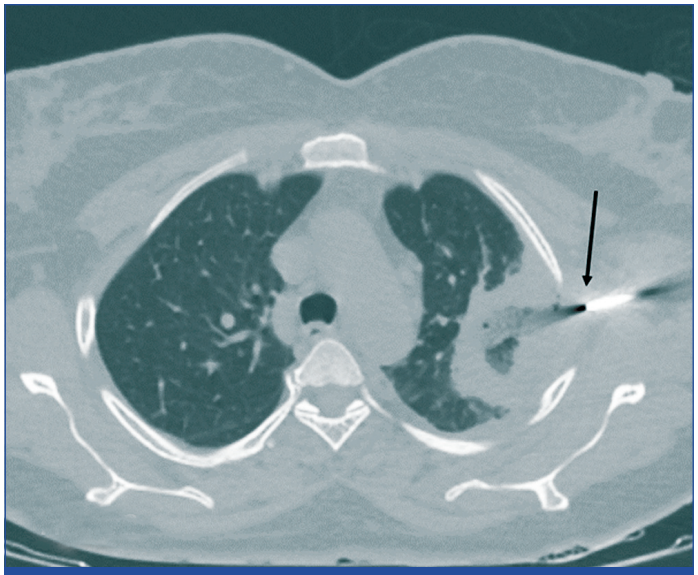
Mucormycosis is an opportunistic fungal infection caused by fungi belonging to the order Mucorales. The most common risk factors include diabetes mellitus, haematological malignancy, and solid organ or stem cell transplant [1,2]. It occurs due to the inhalation of fungal spores into the bronchi and alveoli, which results in rapidly progressing pneumonia with endobronchial disease [1,2]. Vascular invasion causes haemoptysis [1,2]. The most common sites of



[Table/Fig-1]: CT chest topogram demonstrates an ill-defined air space opacity in the left upper zone close to the lateral chest wall.



[Table/Fig-2]: a,b) Contrast-enhanced CT chest demonstrates a mass in the apicoposterior segment of the left upper lobe measuring 6.2×4.5×4.3 cm (white arrow), with a central area of ground-glass opacity with surrounding consolidation, reverse halo sign (Black arrow); c,d) Contrast-enhanced CT chest shows consolidation around the left 2nd rib with no definitive rib erosion. The lesion in the contrast enhanced CT shows a broad-based attachment to the pleura with extension across the left first and second intercostal spaces into the chest wall (white arrows).



[Table/Fig-3]: CT chest demonstrates the biopsy needle within the lesion CT guided biopsy.

infection include lungs, sinuses, brain, and skin [1,2]. In the present case, the patient had diabetes as a risk factor. The thoracic wall is an unusual location for mucormycosis, and very few cases of anterior thoracic wall involvement have been described in the literature. In one case described by Eaton ME et al., mucormycosis directly involved the sternum, leading to destructive osteomyelitis [3], and the other case was described by Asai K et al., [4] in which a patient was undergoing chemotherapy for leukaemia, and developed pulmonary mucormycosis that spread beyond the lung to invade the anterior chest wall and sternum. Pulmonary mucormycosis causes nonspecific symptoms such as persistent fever, cough, shortness of breath, haemoptysis and chest pain. The symptoms remain non-specific even at late stages of infection. Rare cases can also present as progressive subcutaneous emphysema, pancoast syndrome, Horner's syndrome, chronic mediastinitis, and bronchial perforation [2,5,6]. The radiological manifestations of pulmonary mucormycosis are nonspecific. Mucormycosis can manifest as the "reverse halo" sign on CT, which describes a consolidation with central ground-glass [2]. Reverse halo sign was noted in the present case. The prognosis of pulmonary mucormycosis has shown little improvement over the past decade. The disease carries a high mortality rate, estimated at 76% overall and rising to 95% with extra thoracic dissemination [5]. To conclude, mucormycosis can mimic a neoplasm with chest wall involvement, and the imaging findings like reverse halo sign on CT, can help in diagnosis, as in the present case. Pulmonary mucormycosis merits consideration in the differential diagnosis of lung masses in patients with diabetes mellitus.

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