



NOT ALL THAT IS BLACK IS ANTHRACOSIS: A CASE REPORT



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Introduction

- Malignant pleural mesothelioma (MPM) is an aggressive mesothelial-derived neoplasm linked to asbestos exposure.
- The sarcomatoid variant is the rarest subtype (10–20%) and the most diagnostically challenging, showing high-grade spindle-cell morphology that overlaps with sarcomatoid carcinoma, synovial sarcoma, and solitary fibrous tumor.
- Medical thoracoscopy (sensitivity 87–92% for MPM) provided the full-thickness parietal pleural tissue on which histomorphology and IHC established the diagnosis — cytology alone (sensitivity as low as ~6–50% in sarcomatoid MPM) had failed to do so.

Objective

To describe the histomorphological and immunohistochemical features of a rare sarcomatoid malignant pleural mesothelioma presenting with atypical melanin-like pleural pigmentation, and to outline the IHC panel required to distinguish it from its morphological mimics.

Case Presentation

1 Presentation

50-yr male, non-smoker — 2 months dry cough & right pleuritic pain; stony dull right hemithorax. No history of asbestos exposure and lung malignancy

2 Imaging

CXR: right “whiteout” with mediastinal shift. CECT: apical pleural thickening, parietal nodularity, mediastinal lymphadenopathy.

3 Pleuroscopy

3,000 mL hemorrhagic fluid drained; melanin-like hyperpigmented patches & firm nodules on parietal pleura.

4 Histopathology + IHC

High-grade spindle cells; WT1+, CK7+, HBME-1 focal+, BAP1 equivocal → sarcomatoid MPM.

5 Staging & Treatment

PET-CT: N2 nodal & tract seeding, M0 → Stage IIIB. Talc pleurodesis; carboplatin + nivolumab/ipilimumab.

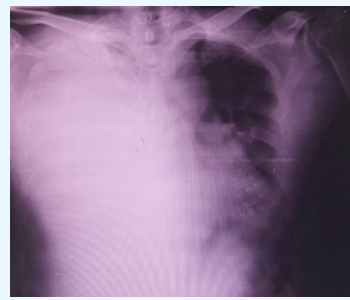


Figure 1: Chest X Ray Showing Right Sided Pleural Effusion

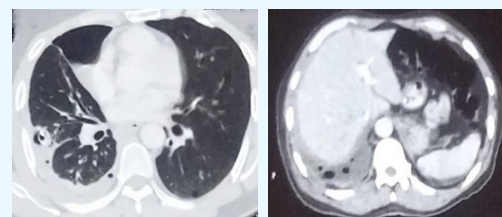


Figure 2: CT CAP with Contrast showing irregular right apical pleural thickening, persistent nodularity along the parietal pleura, and significant mediastinal lymphadenopathy.

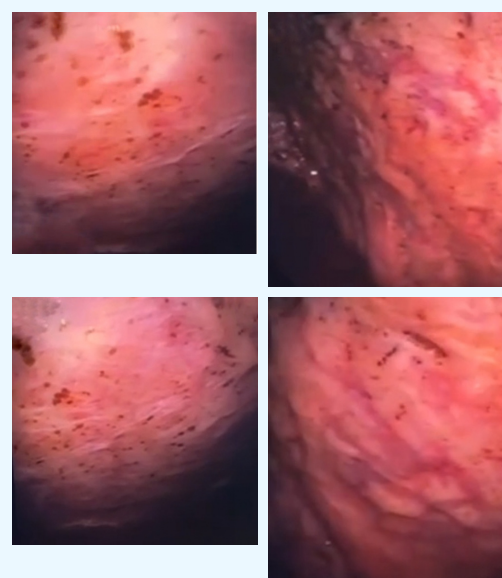


Figure 3: Pleuroscopy showing melanotic patches and variable size nodules on parietal pleura

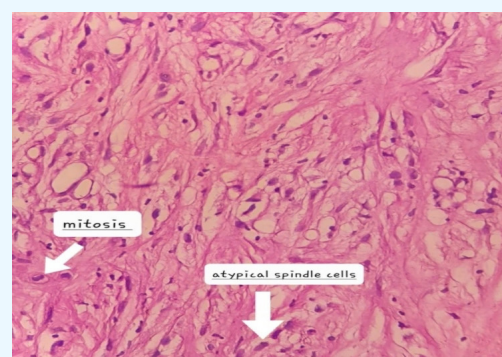


Figure 4: Histopathology of pleural biopsy showing proliferation of spindle cell and mitotic activity

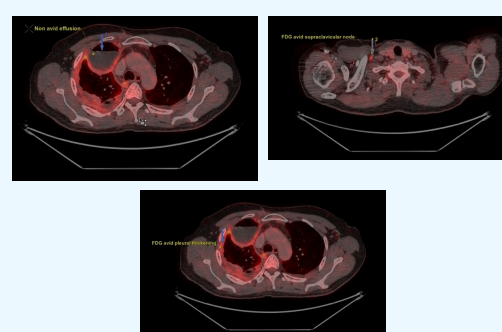


Figure 5: PET CT scan showing linear appearing solitary FDG avid right supraclavicular node and diffuse hypermetabolic right pleural thickening along with moderate pleural effusion

Results & Analysis

Parameter	Reference	Result
Hemoglobin	11.0–15.5 g/dL	9.47 g/dL
Fluid appearance	—	Hemorrhagic, yellow
Protein (exudate >3.0)	g/dL	5.1 g/dL
LDH	<200 U/L	566 U/L
Lymphocytes	<50%	90%
ADA	<30 U/L	18 U/L (nl)
Cytology / ZN / AFB / GeneXpert	—	Negative

Differential Diagnosis

Pleural anthracosis

- Biopsy: high-grade spindle-cell malignancy, WT1/CK7/HBME-1 positive.

Silicosis / coal-worker's pneumoconiosis

- No pneumoconiotic nodules or plaques; diffuse malignant involvement.

Pleural tuberculosis

- Normal ADA, no granulomas; ZN, AFB & cultures negative.

Fungal infection (Aspergillus / Mucor)

- No microbial growth; only malignant spindle cells on histology.

Metastatic melanoma

- No melanocytic features; IHC confirmed mesothelial lineage.

Hemosiderin-laden macrophages

- IHC diagnostic of sarcomatoid MPM, not old hemorrhage alone.

Conclusion

- Melanin-like pleural pigmentation is not always anthracosis — IHC (WT1, CK7, HBME-1) is essential to unmask sarcomatoid mesothelioma hiding beneath it.
- Early implementation of medical thoracoscopy ensures a superior diagnostic yield by providing adequate full-thickness pleural tissue for extensive histopathology.

Declaration Statements

We declare no conflict of interest among authors
The authors declare that written informed consent was obtained from the patient.
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