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Research paper

A Case Report of Primary Pleural Melanoma

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Abstract

Primary malignant pleural melanoma is an extremely rare neoplasm, and to the best of our knowledge, there have been 40 cases of primary pulmonary melanoma reported, but only 8 cases of primary pleural melanoma in the literature. We herein report a rare case in which cytological and immunocytochemical analyses of pleural fluid and an ultrasonography (US)-guided biopsy of a pleural lesion were useful for diagnosing primary pleural melanoma. This case highlights the importance of careful physical examinations, cytomorphologic and immunocytochemical analyses of pleural fluid, as well as the utility of US-guided biopsy of the pleural lesions in the diagnosis of primary pleural melanoma.

Keywords: *Pleural; Melanoma; Ultrasound-Guided Biopsy.*

1. Introduction

Primary pulmonary malignant melanoma is an extremely rare tumor [1], accounting for less than 1% of primary extracutaneous lesions. However, primary pleural melanoma is exceedingly rare. To our knowledge, there have been 40 cases of primary pulmonary melanoma reported [2], [3] but only, but only 8 cases have been reported [4], [5]. This report presents a rare case of primary pleural melanoma with rapid progression in a 31-year-old man with no comorbidities who was diagnosed with primary malignant pleural melanoma.
Observation
A 31-year-old patient with a family history of a father who died of an unspecified carcinoma and a brother who had malignant lymphoma that was treated and cured two years ago. The patient presented with one month of chest pain and dyspnea. Clinical examination revealed that the patient's general condition was impaired. Examination of the chest revealed polypnea at 22 cycles/min and right pleural effusion syndrome. Chest X-ray showed right-sided water-like opacity and nodular parenchymal images on the left (Fig. 1).

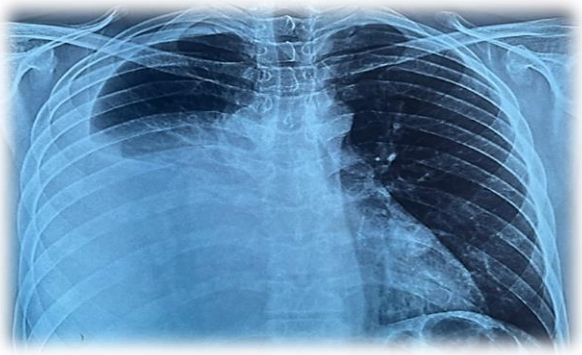

Fig. 1: Chest X-Ray Shows Extensive Right Pleural Effusion with Some Nodular Opacities on the Left.

The chest CT scan disclosed pleural masses encasing the right lung with ipsilateral pleural effusion and bilateral pulmonary parenchymal nodules predominantly on the left side (Fig. 2).
Pleural aspiration removed serosanguineous fluid, and cytological examination revealed carcinomatous cells. Thoracic ultrasound of the right lung showed significant diffuse circumferential pleural thickening with compartmentalized pleural effusion (Fig. 3), and ultrasound-guided trans-parietal biopsy revealed malignant tumor proliferation consisting of large cells arranged in clusters. The tumor cells had large,

atypical nuclei with prominent nucleoli and cytoplasm showing significant melanin deposition. Immunohistochemical analysis showed tumor cell reactivity to HMB45, anti-S100 protein, and Melan A antibodies.

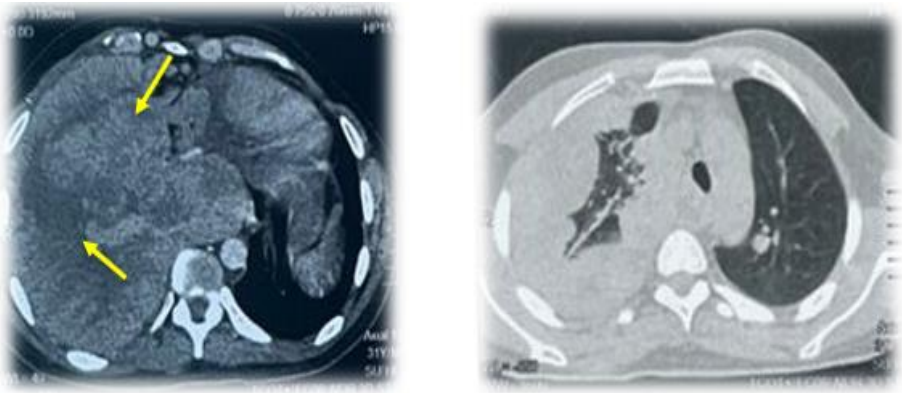

Fig. 2: Chest CT Scan Shows Pleural Masses Encasing the Right Lung and Bilateral Pulmonary Parenchymal Nodules, Predominantly on the Left Side.

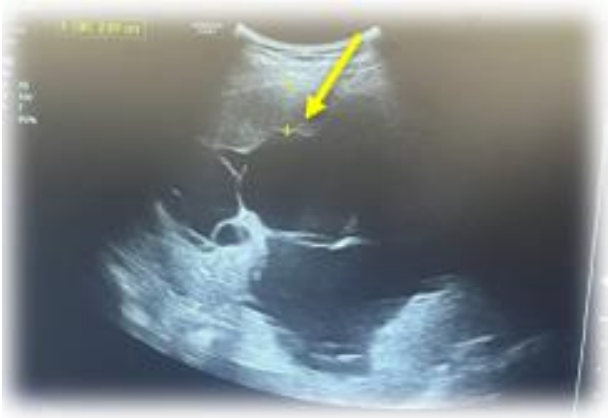

Fig. 3: Thoracic Ultrasound of the Right Lung Showing Diffuse Circumferential Pleural Thickening with Compartmentalized Effusion.

Thus, a diagnosis of primary pleural melanoma was made. An examination to check for other sites, including an examination of the skin and appendages and an ophthalmological examination with fundus examination, showed no other melanocytic sites, but a brain scan revealed osteolysis of the right parietal cranial vault with intracranial extension in contact with the parenchyma without mass effect (Fig. 4).

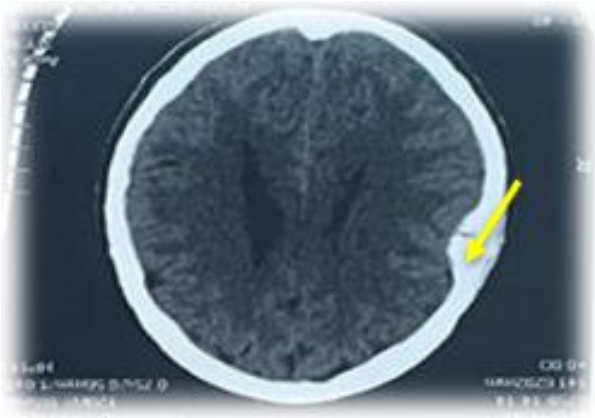

Fig. 4: Cerebral CT Scan Revealed Osteolysis of the Cranial Vault, Right Parietal with Intracranial Extension in Contact with the Parenchyma Without Mass Effect.

The patient received an initial course of immunotherapy, and a thoracoscopy with talc pleurodesis was scheduled for palliative purposes due to the rapid recurrence of pleural effusion. Unfortunately, the patient's condition deteriorated rapidly with the onset of dyspnea. The patient died on the fourth day after the targeted therapy initiation.

2. Discussion

Malignant melanoma predominantly arises in the skin and mucosa close to the skin; for instance, oral mucosa, intraocular mucosa, head and neck, reproductive system, rectum, and crissum. Around 160,000 new cases are diagnosed, accompanied by 41,000 melanoma-related deaths every year worldwide [6].

Although pleural metastasis from cutaneous melanoma is relatively common, primary pleural melanoma is extremely rare. To the best of our knowledge, there have only been 8 case reports of this condition (Table) [4], [5].

Table 1: Treatment and Prognosis of the Previously Reported Case Reports

Reference	Age	Sex	Treatment	Prognosis
[4]	49	M	Adriamycin	10 MONTHS
[5]	40	M	The patient refused treatment.	1 MONTH
[7]	50	M	Chemical pleurodesis Dacarbazine + Cisplatin + Vincristine	NOT AVAILABLE (AT LEAST 7 MONTHS)
[8]	49	M	None	2.5 MONTHS
[9]	46	M	Chemical pleurodesis Dacarbazine + Cisplatin + Vincristine	NOT AVAILABLE (AT LEAST 7 MONTHS)
[10]	36	F	The patient refused treatment.	1 MONTH
[11]	61	M	Dacarbazine + Cisplatin + Interferon-α2b	2 MONTHS
[12]	61	M	THE PATIENT REFUSED TREATMENT.	NOT AVAILABLE

The clinical manifestation and imaging features of primary pulmonary melanoma are not specific, and it does not differ from mesothelioma or pleural metastasis. In addition, it cannot be discriminated from other forms of primary melanoma according to its histology and immunohistochemistry. Therefore, the diagnosis is very difficult and is based on several clinical, radiological, and histopathological criteria. Not for pleural but for primary pulmonary melanoma, Jensen and Egedorf proposed the following six clinical criteria for diagnosis : (1) no previously removed pigmented skin tumors, (2) no ocular tumors removed, (3) a solitary tumor in the surgical specimen, (4) tumor morphology compatible with a primary tumor, (5) no demonstrable melanoma in other organs at time of operation, and (6) autopsy without primary melanomas being demonstrated elsewhere. These criteria should hold well for pleural melanoma as they do for pulmonary melanoma.

The established pathological criteria incorporate pathognomonic immunohistochemical staining for S-100 and HMB-45, evidence of junctional change with nesting of melanoma cells or spindle cells arranged in fascicles, and invasion of pleural epithelium in an area without epithelial ulceration. Indeed, other melanotic tumors, such as melanotic medullary carcinoma of the thyroid and pigmented neuroendocrine carcinoma, should be excluded. Our case was challenging because it was difficult to exclude other differential diagnoses, such as mesothelioma or pleural metastasis; however, pleural biopsy combined with the application of Jensen's clinical criteria and findings helped us to confirm this unusual diagnosis. This diagnosis was also immunohistochemically confirmed; the staining demonstrated that the tumor cells expressed HMB45, S-100, and MART-1, whereas they did not express CK, EMA, Syn, and high molecular weight cytokeratin. The treatment of choice for primary pulmonary melanoma is an aggressive surgical approach, in addition to radiation therapy, chemotherapy, and immunotherapy [13], [14].

3. Conclusion

Primary Malignant Pleural Melanoma is an extremely rare neoplasm and has a high degree of malignancy, a tendency toward recurrence, and a poor prognosis. The diagnosis of primary pulmonary melanoma is very difficult and is based on several clinical, radiological, and histopathological criteria. The treatment of choice is an aggressive surgical approach, combined with radiation therapy and chemotherapy. Novel immunotherapy has shown promising results, and further studies are needed.

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