Case Report

A primary malignant melanoma of the mediastinum with gross surgical view

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Abstract: Primary malignant mediastinal melanomas are rare. Few studies have reported on the chest computed tomography (CT) scan and histopathological features. We report a case of a primary malignant mediastinal melanoma in a 32-year-old man and provide a gross surgical view of the tumour.

Keywords: Mediastinum; tumor; melanoma; surgery

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Case presentation

A 32-year-old man with an unremarkable medical history was referred to our hospital because of persistent hoarseness for 2 months. Physical examination revealed right-sided vocal cord palsy. A chest computed tomography (CT) scan revealed a right, anterosuperior mediastinal mass, and a whole-body positron emission tomography (PET) scan revealed a high standardised uptake value (SUV) of 8.5, with a photon defect in the same area as the lesion without the evident of distance metastasis (*Figure 1*). The imaging findings indicated that the hoarseness was caused by compression of the right recurrent laryngeal nerve by the mediastinal mass. Fine needle aspiration was performed, but a diagnosis could not be made on the basis of its findings. A surgical biopsy was performed through transclavicular approach to remove anterosuperior mediastinal mass. The mass resembled black, gelatinous glue; occupied the right anterosuperior mediastinal mass; and affected the right recurrent laryngeal nerve beneath the right subclavian artery, which was the proposed cause of the patient's vocal cord palsy (*Figure 2*). Histopathological analysis of the biopsy sample revealed a malignant melanoma (*Figure 3*); and surgical resection was performed. Because no similar lesions were observed at other sites of the patient's body, the patient was diagnosed as a primary malignant mediastinal melanoma. One week after surgery, he was discharged without any complications. The patient now visits our hospital for routine medical check-ups to allow for early detection of any tumour recurrence.

Discussion

Mediastinal masses have wide histopathological features and could be divided into anterior, middle and posterior mediastinal mass. Anterior mediastinal mass consists of 50% of all mediastinal masses. The most common primary anterior mediastinal masses are thymomas, teratomas, lymphomas, and other rare malignancies such as melanomas and Pancoast tumours. Middle and posterior mediastinal mass mostly consists of congenital cysts and neurogenic tumors (1). Most cases of mediastinal masses are incidentally identified on chest radiographs or suspected by clinical symptoms caused by such as cough, dysphagia or hoarseness associated with recurrent nerve palsy, as was observed in our patient (2). Primary malignant melanoma of the mediastinum is an extremely rare condition characterised by the occurrence of a lesion only at the mediastinum. Cormier *et al.* reported metastatic mediastinal melanoma in mediastinal lymph node arising from unknown primary site, which accounts for 1% to 8% of all melanoma (3,4). But a primary mediastinal melanoma is only diagnosed when exclude other primary melanoma site in body. Possible explanations for mediastinal melanoma depend upon the

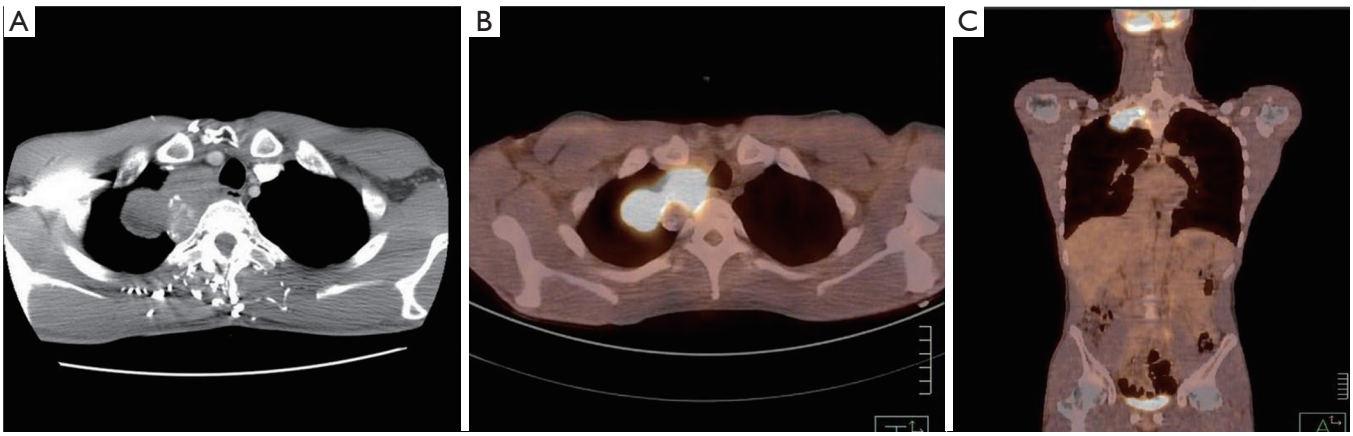

Figure 1 Radiology examination. (A) Chest computed tomography (CT) examination revealed a right superior mediastinal mass with a calcified spot; (B) a positron emission tomography (PET) scan showed a high standardised uptake value (SUV) of 8.5 with a photon defect area; (C) the mass was only detected in the right superior mediastinum on a PET scan.

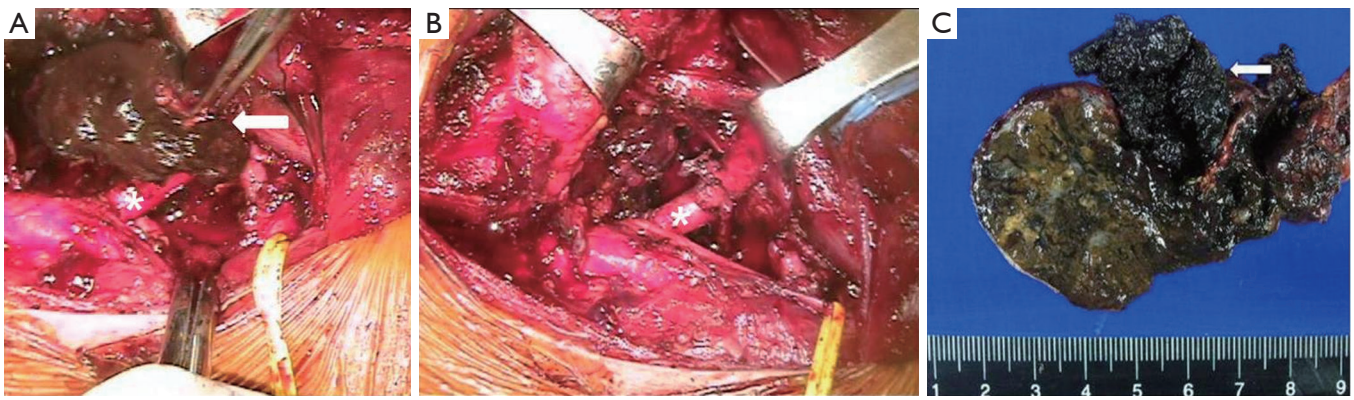

Figure 2 Operation results. (A) Surgical view of the mediastinal melanoma (white arrow) adjacent to the right common carotid artery (asterisk); (B) removed state through the transclavicular approach; (C) gross presentation of the melanoma with melanin, corresponding to the high standardised uptake value (SUV) level and a coexisting photon defect on the positron emission tomography (PET) scan (white arrow).

tumour location. In the case of primary malignant melanoma in the posterior mediastinum, a malignant change of the ectopic nevus cells of the lymph nodes may cause these tumours, whereas aggregation of nevus cells in the thymus or mediastinal lymph nodes may cause primary malignant melanoma of the anterior mediastinum (5,6). The prognosis has not been well defined and there is no consensus regarding the preferred treatment for metastatic mediastinal or primary mediastinal melanoma. Recently, Karuppiah and Buchan have suggested complete resection and adjuvant chemotherapy or radiation therapy as the treatment of choice (7). CT images play an essential role in diagnosis of mediastinal masses. These images showed the mass components, the degree of vascularisation and the anatomical relationships between mass and mediastinal structure (1). Calcified spots may be present in primary malignant melanoma, as in this case, and in rare pigmented tumours, including pigmented extra-adrenal paraganglioma, pigmented carcinoid tumour of the thymus, melanotic neuroectodermal neoplasm, melanotic schwannoma, given the nature of the embryological neural crest origin (8-11). FDG PET scan is also useful imaging method to evaluate various primary masses in mediastinum and distant metastases but diagnosis is rarely established prior to biopsy or surgery. So, percutaneous or surgical biopsy should be performed for diagnosis of mediastinal mass (1). We performed left side transclaicualar approach for

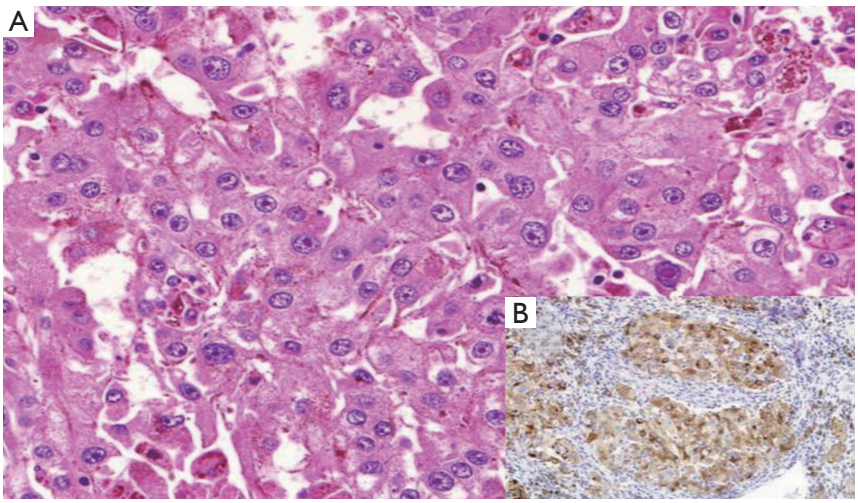

Figure 3 Pathological examination. (A) Haematoxylin and eosin staining showing atypical pleomorphic melanocytes with prominent nucleoli and melanin pigments (×400); (B) positive immunohistochemical staining of the malignant melanocytes with human melanoma black-45 (×200).

anterior mediastinal mass because the mass was extended to thoracic inlet. This approach consisted of resection of the inner one third of the clavicle and extension of the incision to 2nd intercostal space. This method easily allowed to remove the anterosuperior mediastinal mass (12). Hematoxylin and eosin staining showed atypical pleomorphic melanocytes with prominent nucleoli and melanin pigments and the immunohistochemical analysis showed the malignant melanocytes with human melanoma black-45. He was diagnosed of primary mediastinal melanoma because there was no evidence of distant metastasis by FDG PET scan at other sites in body.

CT images of mediastinal melanoma could only show diffuse heterogeneously mass with calcification. It might be confused with other mediastinal masses such as lymphoma, thymic carcinoma and germ cell tumors. When evaluating mediastinal mass with CT, A rare primary malignancy, melanoma, should be considered. We reported the treatment experience of malignant mediastinal melanoma with surgical view.

Acknowledgements

None.

Footnote

Conflicts of Interest: The author has no conflicts of interest to declare.

References

1. Juanpere S, Cañete N, Ortuño P, et al. A diagnostic approach to the mediastinal masses. Insights Imaging 2013;4:29-52.
2. Davis RD Jr, Oldham HN Jr, Sabiston DC Jr. Primary cysts and neoplasms of the mediastinum: recent changes in clinical presentation, methods of diagnosis, management, and results. Ann Thorac Surg 1987;44:229-37.
3. Vlodavsky E, Ben-Izhak O, Best LA, et al. Primary malignant melanoma of the anterior mediastinum in a child. Am J Surg Pathol 2000;24:747-9.
4. Cormier JN, Xing Y, Feng L, Huang X, et al. Metastatic melanoma to lymph nodes in patients with unknown primary sites. Cancer 2006;106:2012-20.
5. Krausz T, Azzopardi JG, Pearse E. Malignant melanoma of the sympathetic chain: with a consideration of pigmented nerve sheath tumours. Histopathology 1984;8:881-94.
6. Yamamoto N, Maeda S, Mizoguchi Y. Malignant paraganglioma arising from the kidney. Int J Clin Oncol 2007;12:160-2.
7. Karuppiah SV, Buchan KG. Primary malignant melanoma: a rare cause of mediastinal mass. Jpn J Thorac Cardiovasc Surg 2006;54:396-8.
8. Yamamoto N, Maeda S, Mizoguchi Y. Malignant paraganglioma arising from the kidney. Int J Clin Oncol 2007;12:160-2.
9. Moran CA, Suster S. Neuroendocrine carcinomas (carcinoid tumor) of the thymus. A clinicopathologic analysis of 80 cases. Am J Clin Pathol 2000;114:100-10.

10. Gaiger de Oliveira M, Thompson LD, Chaves AC, et al. Management of melanotic neuroectodermal tumor of infancy. Ann Diagn Pathol 2004;8:207-12.
11. Marco V, Sirvent J, Alvarez Moro J, et al. Malignant melanotic schwannoma fine-needle aspiration biopsy findings. Diagn Cytopathol 1998;18:284-6.
12. Dartevelle PG, Chapelier AR, Macchiarini P, et al. Anterior transcervical-thoracic approach for radical resection of lung tumors invading the thoracic inlet. J Thorac Cardiovasc Surg 1993;105:1025-34.

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