Metastatic small cell carcinoma of the lung with prominent spindle cell morphology and hemangiopericytoma-like vascular pattern: A sarcoma mimicker

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Abstract
Small cell carcinoma is a malignant neuroendocrine tumor with aggressive clinical behavior. Histologically, the tumor is characterized by the proliferation of small, round, blue cells. Here, we present the case of a 50-year-old man with a 1-month history of enlarging chest wall mass. Microscopic examination of the lesion revealed a highly cellular neoplasm composed of closely packed, atypical spindle cells with scant cytoplasm, inconspicuous nucleoli, and brisk mitotic activity. The hemangiopericytoma-like vascular pattern was prominent. Areas showing a fibrosarcoma-like fascicular pattern were also observed. The tumor was immunohistochemically positive for TTF1, synaptophysin, and chromogranin, confirming small cell carcinoma. Further investigations revealed a lung origin and widespread metastases. The tumor in this case closely mimicked synovial sarcoma or malignant peripheral nerve sheath tumor. Small cell carcinoma demonstrates a hemangiopericytoma-like pattern that can mimic sarcoma histologically. This is a serious pitfall that can significantly affect the speed of diagnosis and management.

Keywords
Sarcoma, small cell carcinoma

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Introduction
Small cell carcinoma of the lung is a highly malignant neoplasm representing one of the two high-grade variants of neuroendocrine lung tumors.1 Widespread metastasis at the time of diagnosis is common.2 Microscopically, the tumor shows proliferation of small round to oval cells with fine nuclear chromatin, scant cytoplasm, and inconspicuous nucleoli. Brisk mitotic and apoptotic activity and necrosis are common.3 Crush artifact, especially on small biopsies, and Azzopardi phenomenon, defined as encrustation of hematoxyphilic nuclear material in vessel walls, are frequently observed.4 Here, we present the case of a 50-year-old male with metastatic small cell carcinoma of the lung. Although spindle cell morphology can be seen in small cell carcinoma,3 this case also showed many staghorn blood vessels and a fibrosarcoma-like fascicular pattern, which can be a serious diagnostic pitfall.

Case report
A 50-year-old man presented with a 1-month history of an enlarging, painless chest wall mass. The patient has been a smoker for 30 years (two packets per day). The mass was excised, and gross examination revealed a hard, whitish, subcutaneous lesion with infiltrative borders. The lesion measured 3.8 cm in maximum dimension. Microscopic examination revealed a highly cellular neoplasm composed of closely packed, atypical spindle cells with scant cytoplasm, nuclear hyperchromasia, and brisk mitotic activity. A prominent hemangiopericytoma-like vascular pattern was observed (Figure 1). Moreover, a fibrosarcoma-like fascicular pattern was focally identified. Lymphovascular invasion was also observed. The tumor cells were immunohistochemically positive for TTF1, synaptophysin, and chromogranin, confirming small cell carcinoma. Further investigations revealed a lung origin and widespread metastases. The tumor in this case closely mimicked synovial sarcoma or malignant peripheral nerve sheath tumor. Small cell carcinoma demonstrates a hemangiopericytoma-like pattern that can mimic sarcoma histologically. This is a serious pitfall that can significantly affect the speed of diagnosis and management.

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preferred diagnosis. Further evaluation by positron emission tomography–computed tomography (PET/CT) whole-body scan revealed an irregular spiculated right hilar lung mass with widespread metastases to the brain, liver, and adrenal glands. The cervical, supraclavicular, mediastinal, and retroperitoneal lymph nodes were also involved. The patient was scheduled for radio- and chemotherapy.

Discussion

Small cell carcinoma of the lung is disseminated at the time of diagnosis in approximately 90% of cases.² The typical small-round-blue cell morphology and brisk mitotic and apoptotic activity are helpful clues for proper diagnosis in the clinical context. Necrosis, crush artifact, and Azzopardi phenomenon are common. A history of smoking, as in this case, is present in almost all cases.⁵ Interestingly, the smoking history in this case was only revealed after the histopathological diagnosis had been established. Microscopically, the tumor was very cellular and was composed of spindle cells in a fibrosarcoma-like fascicular pattern. These features, along with the presence of a prominent hemangiopericytoma-like vascular pattern, strongly suggested peripheral nerve sheath tumor or monophasic synovial sarcoma.¹⁶ No prominent crush artifact or Azzopardi phenomenon was observed. Small cell carcinoma of the lung was included in the differential diagnosis list because of the high mitotic and apoptotic activity present. However, the presence of hemangiopericytoma-like patterns weakened this possibility. Many growth patterns can be observed in small cell carcinomas. Diffuse growth of tumor cells in sheets is the most common.³ However, Nicholson et al.⁴ have reported that the organoid/nested pattern was the most common in their study of 100 cases. Rarely, if the cells surrounding the blood vessels remain viable, while the intervening cells are necrotic, then a pseudopapillary pattern can be seen.⁴ Peripheral palisading, rosetting, and trabecular patterns are among the rare patterns that can be observed. It is important to mention that the presence of typical neuroendocrine morphology does not exclude small cell carcinoma. To the best of our

Figure 1. Prominent staghorn blood vessels.

Figure 2. Tumor cells positive for (a) TTF1, (b) synaptophysin, and (c) chromogranin and (d) Ki67 proliferative index was approximately 80%.
knowledge, a prominent hemangiopericytoma-like pattern has not been reported in small cell carcinoma. The tumor cells were immunohistochemically negative for S100 and BCL2, which excluded malignant peripheral nerve sheath tumor, synovial sarcoma, or even spindle cell melanoma.7,8 The tumor cells were positive for TTF1, synaptophysin, and chromogranin, confirming small cell carcinoma.1,9

Conclusion
In conclusion, small cell carcinoma must be considered in any metastatic high-grade malignant tumor of unknown origin. Moreover, it can demonstrate prominent hemangiopericytoma-like vascular patterns and mimic sarcoma. The pathologist should be aware of such a serious diagnostic pitfall to reach the proper diagnosis as early as possible.

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Written informed consent was obtained from the patient(s) for their anonymized information to be published in this article.