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Case Report

Mediastinal benign epithelioid schwannoma: a rare tumor in an unreported location

Xiupeng Zhang, Guiyang Jiang, Enhua Wang, Xuyong Lin

Department of Pathology, The First Affiliated Hospital and College of Basic Medical Sciences, China Medical University, Shenyang, China

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Abstract: Benign epithelioid schwannoma is a very rare variant of schwannoma, that can pose a diagnostic challenge. The reported cases were predominantly located in dermal/subcutaneous tissue. Although conventional schwannoma occurring in the posterior mediastinum was common, to our knowledge, no mediastinal benign epithelioid schwannoma was reported in English literature. Herein, we presented a case of mediastinal benign epithelioid schwannoma in a 50-year-old Chinese male. Histologically, the tumor was well encapsulated and consisted of sheets of epithelioid tumor cells with mild cellular atypia set in fibrous or myxoid stroma. Immunohistochemically, the tumor cells were positive for S-100, GFAP and Vimentin, negative for cytokeratin, EMA, P63, Actin (SM), CD3, CD20, CD30, CD31, CD34, cytokeratin19, HMB45, CD68 and Desmin. Ki-67 proliferation index was approximately 2%. Based on morphologic features and the immunohistochemical staining, the tumor was diagnosed as an epithelioid schwannoma. It should be noted that epithelioid schwannoma may be also an important differential diagnosis in mediastinal tumor.

Keywords: Epithelioid schwannoma, schwannoma, mediastinum

Introduction

Schwannoma is a relatively common soft tissue tumor, which was composed of differentiated Schwann cells. Histologically, in addition to classic type, schwannoma also includes various morphologic patterns, such as pseudoglandular schwannoma [1, 2], cellular schwannoma [3, 4], ancient schwannoma [5], neuroblastoma-like schwannoma [6] and epithelioid schwannoma [7]. Epithelioid schwannoma was predominately composed of epithelioid Schwann cells usually lacking characteristic Antoni A areas and Antoni B areas, which could pose a great diagnostic challenge. Compared to malignant epithelioid peripheral nerve sheath tumor, benign epithelioid schwannoma is extremely rare. So far, the larger series of cases report of benign epithelioid schwannoma was from Hart J et al. and Laskin WB et al. [8, 9]. The reported cases predominantly involved the dermis/subcutis tissue of limbs and trunk [8-10]. Less common occurring sites included the urinary bladder [11], head and neck [12], breast [8], colon [13] and intracranial nerve [14-17]. Although classic schwannoma was easily encountered in the mediastinum, to our knowledge, there is no report of epithelioid variant thus far. Herein, we presented the first case of mediastinal epithelioid schwannoma. The tumor morphologically consisted exclusively of epithelioid cells, which was easily misdiagnosed as the absence of typical pattern.

Case report

Clinical history

A 50-year-old man was admitted to our hospital for complaining of cough and sputum for half a month. Computed tomography scan revealed there was a cystic shadow measuring 4.87×4.29 cm with uniform density and clear edge in the posterior mediastinum. The CT value was 9.8 HU. The lesion was mild strengthened with contrast CT, but the margin was significantly strengthened. The enhanced CT value was 17.28 HU (**Figure 1**). Physical examination and routine laboratory studies were all within normal values. In the current visit, the patient underwent tumor resection in our hospital. The postoperative course was uneventful.

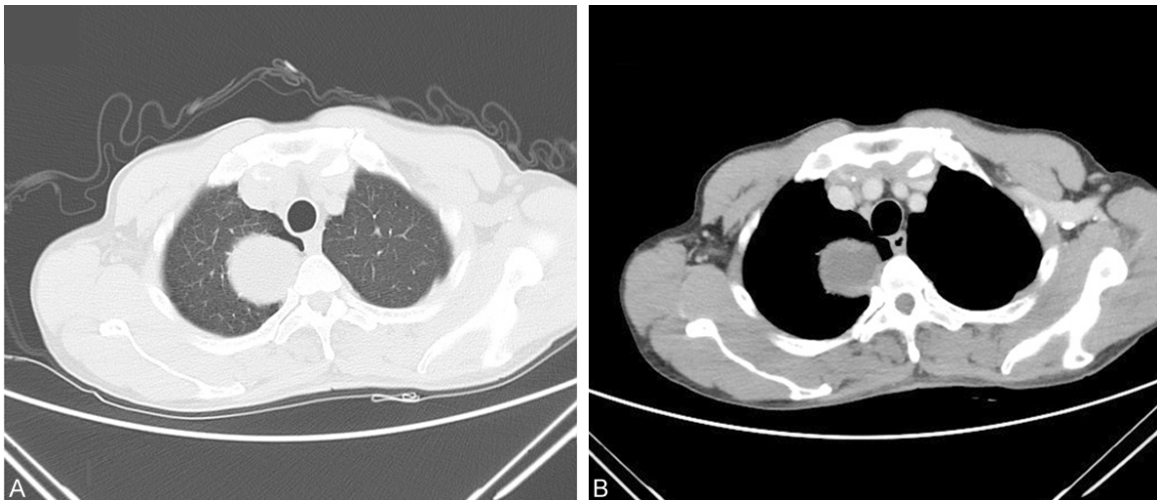

Figure 1. CT presentation of the tumor. A. There was a cystic shadow measuring 4.87×4.29 cm with uniform density and clear edge in the posterior mediastinum. B. The lesion was mild strengthened with contrast CT, the margin was significantly strengthened.

Materials and methods

The resected specimens were fixed with 10% neutral-buffered formalin and embedded in paraffin blocks. Tissue blocks were cut into 4 μm slides, deparaffinized in xylene, rehydrated with graded alcohols, stained with hematoxylin and eosin or immunostained with the following antibodies: cytokeratin (CK), CD68, Vimentin, epithelial membrane antigen (EMA), cytokeratin 19 (CK19), Actin (SM), P63, GFAP, S-100, CD3, CD20, CD31, CD34, HMB45, Desmin and Ki-67. Sections were stained with a streptavidin-peroxidase system (KIT-9720, Ultrasensitive TM S-P, Maxim, China). The chromogen of immunostaining used was diaminobenzidine tetrahydrochloride substrate (DAB kit, Maxim, China), and then the slide was slightly counterstained with hematoxylin, dehydrated and mounted.

Results

Gross features

Grossly, the tumor demonstrated a round mass measuring approximately 4 cm, with intact capsule. The cut face was firm and gray-white in color.

Histologic features

Histologically, the tumor was well encapsulated and composed exclusively of sheets of epithelioid cells in varying myxoid to fibrous stroma. The tumor cells contained ovoid or polygonal nuclei with inconspicuous or small nucleoli. Occasionally, the nuclear inclusion was present in the nuclei of the tumor cell. The mitosis of the tumor cells was absent. The thick-walled blood vessels were readily observed in the tumor. The scattered lymphocytes could also be observed among the tumor cells. Focally, the tumor cells formed the pseudoglandular structure (**Figure 2**).

Immunohistochemical staining

Immunohistochemical staining showed that the tumor cells including the pseudoglandular structure were diffusely positive for S-100, Vimentin, and GFAP, negative for CK, CK19, EMA, Actin (SM), S-100, CD3, CD20, CD31, CD34, HMB45, CD68 and Desmin. Ki-67 proliferation index was approximately 2% (**Figure 3**).

According to the morphological and immunohistochemical findings, the tumor was diagnosed as an epithelioid schwannoma.

Discussion

In soft tissue tumors, schwannoma is readily encountered and easily diagnosed, since it is morphologically characterized by Antoni A areas and Antoni B areas. However, schwannoma also contained several histologic variants including cellular schwannoma [3, 4], pseudoglandular schwannoma [1, 2], plexiform schwannoma [18], ancient schwannoma [5], neuroblastoma-like schwannoma [6] and epithelioid schwannoma [7], which might be difficulty

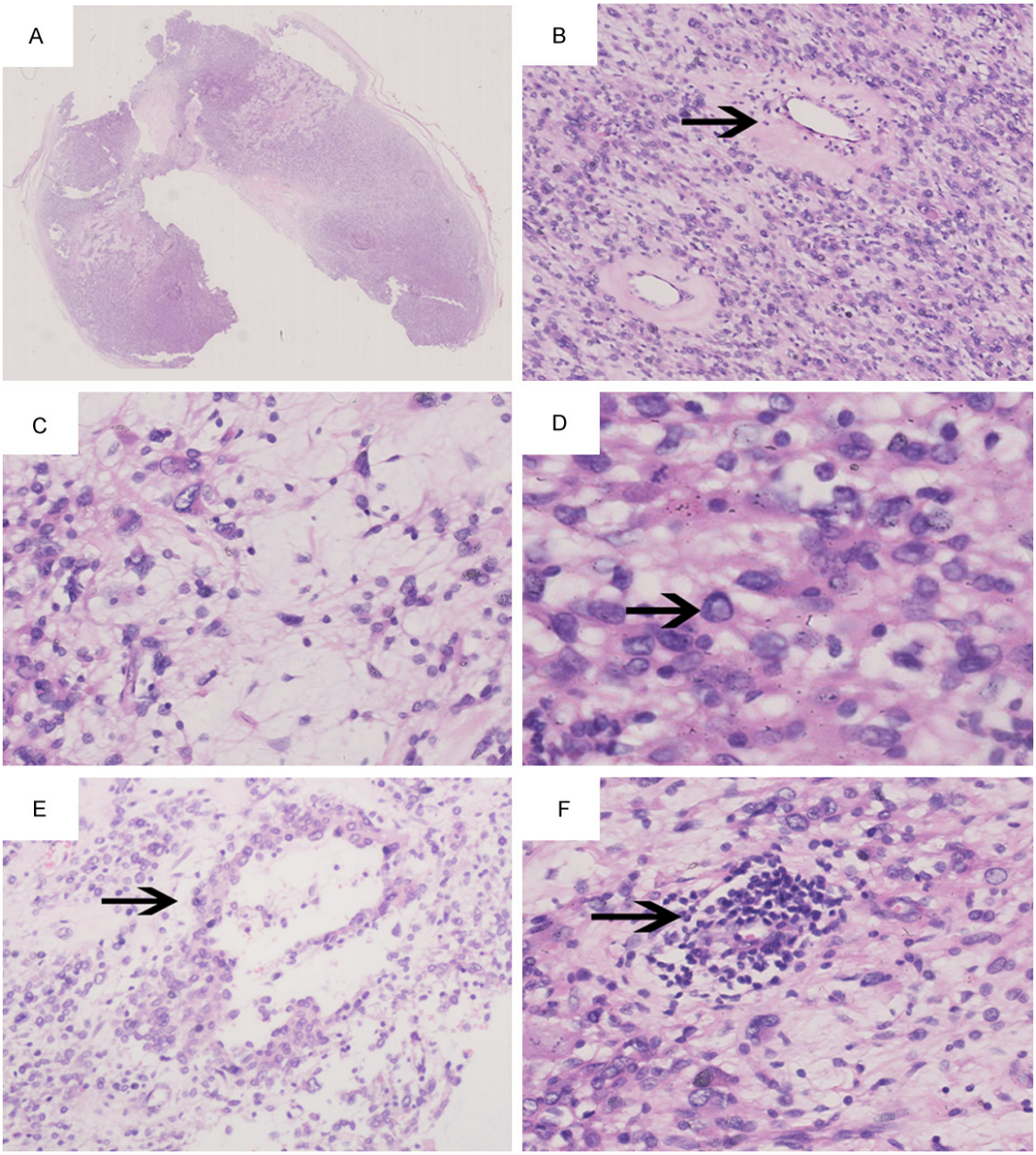

Figure 2. Morphological change of the tumor. A. The lower power demonstrated an ovoid tumor with centrally cystic change and intact capsule. The tumor was composed of alternating cellular areas and myxoid areas. B. The thick-walled blood vessels (Arrow) were easily identified in the tumor. C. The tumor cells were scattered in myxoid area. D. The sheets of epithelioid cells lacked cellular atypia and mitosis. Occasionally, the nuclear inclusion (Arrow) was present in the nuclei of the tumor cells. E. The tumor cells formed irregular pseudoglandular (Arrow). F. The scattered lymphocytes (Arrow) could also be observed among the tumor cells.

of diagnosis. Epithelioid schwannoma is a very unusual variant that is histologically composed of epithelioid cells mimicking epithelial tumors. Because of the rarity, it is still not well defined. In 1981, Taxy *et al.* first described two cases of epithelioid schwannoma, ultrastructurally showing evidence of Schwann cell origin [7]. Then, Hart J *et al*. and Laskin WB *et al*. reported a larger series of cases respectively [8, 9]. Nevertheless, Laskin WB *et al.* advocated that the term "benign epithelioid peripheral nerve sheath tumor" should be used if the tumor lacked the apparent evidence of schwannoma or neurofibroma [9]. In our case, the tumor

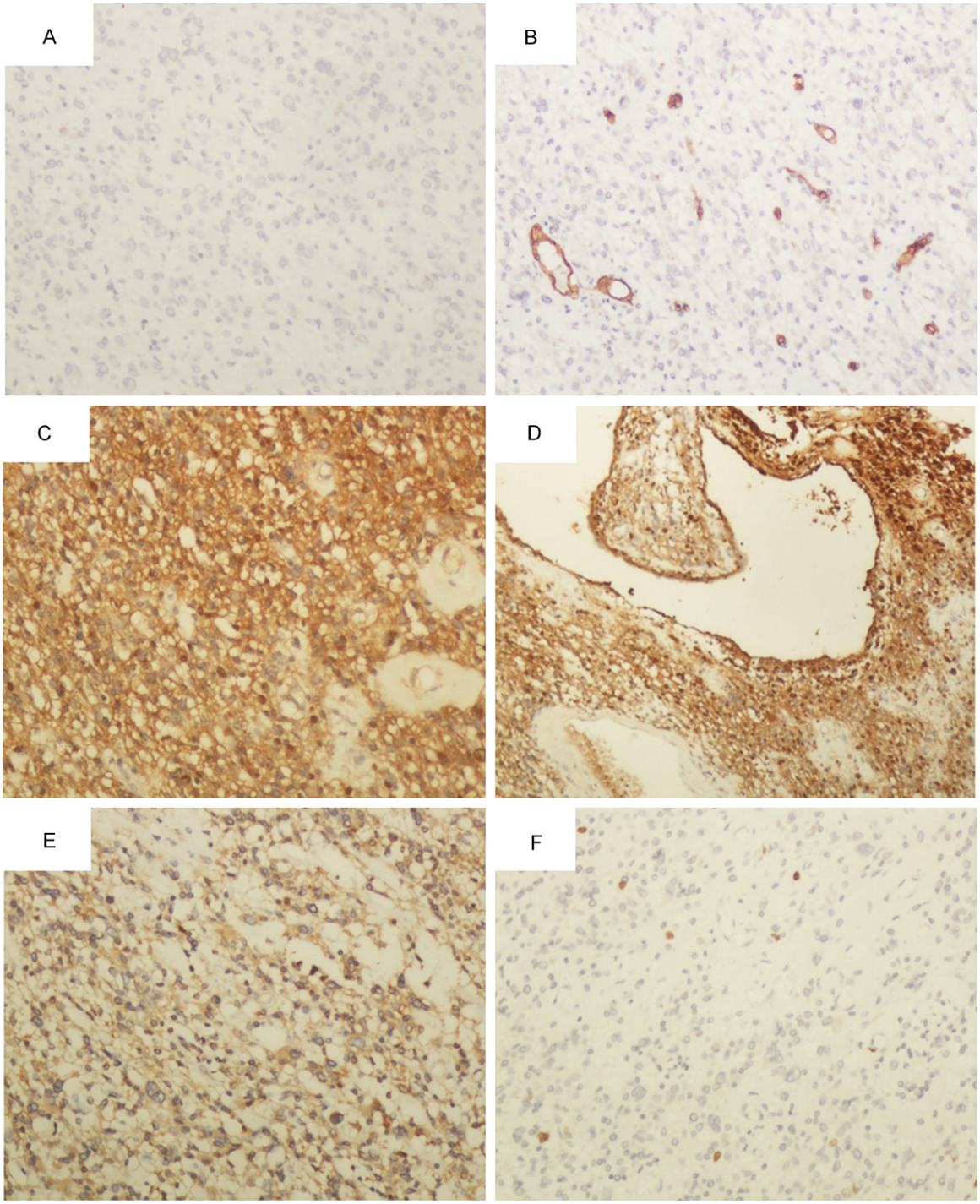

Figure 3. Immunohistochemical staining of the tumor. A. The neoplastic cells were entirely negative for CK. B. CD34 was not expressed in neoplastic cells, but expressed in normal vessel. C. The diffuse and strong staining for S-100 could be observed in the tumor. D. The lining cells of the pseudoglandular structure also stained for S-100. E. The neoplastic cells also showed reactivity for GFAP. F. The Ki-67 proliferative index was approximately 2%.

showing intact capsule and thick-walled vessles, suggesting the diagnosis of schwannoma.

So far, the reported cases predominantly occurred in dermis/subcutis tissue of the upper extremity, lower extremity and trunk [8, 9]. Rarely, the tumor could involve the sites including the urinary bladder [11], head and neck [12], breast [8], colon [13] and intracranial nerve [14-17]. Schwannoma occurring in the mediastinum is common. Mediastinal malig-

nant epithelioid schwannoma was also reported [19]. However, to our knowledge, there is no occurrence report of benign epithelioid schwannoma in the mediastinum in English literature. We presented the first case of mediastinal epithelioid schwannoma that may be misdiagnosed as thymoma or other epithelial tumors.

In contrast to the classic schwannoma characterized by Anotin A areas and Anotin B areas, epithelioid schwannoma was predominately or exclusively composed of epithelioid cells. The typical Anotin A areas and Anotin B areas were not easily encountered. Nevertheless, as seen in the present case, the tumor still demonstrated features of typical schwannoma such as complete capsule, hyalinizing thick-walled vessels and alternating cellular area and myxoid area, which may an important diagnostic clue. Additionally, our case focally showed pseudoglandular structure which was another diagnostic pitfall.

Immunohistochemically, epithelioid schwannoma shows diffuse reactivity to S-100, GFAP and Vimentin [8, 9]. The present case was diffusely positive for S-100, Vimentin, and GFAP, negative for CK, CK19, EMA, Actin (SM), S-100, CD3, CD20, CD31, CD34, HMB45, CD68 and Desmin. The lining cells of the pseudoglandular structure also stained for S-100 and GFAP. The diffuse and strong S-100 expression is helpful for differential diagnosis.

The differential diagnosis of the tumor includes thymoma, epithelioid malignant peripheral nerve sheath tumor, myoepitheliom, melanoma, lipomatous tumor and others epithelial tumors. The correct diagnosis could be made based on histological features and adequate immunohistochemical staining.

In conclusion, we presented the first case of epithelioid schwannoma in the mediastinum. It should be noted that the tumor may be an important differential diagnosis in order not to be misdiagnosed.

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Disclosure of conflict of interest

None.

Address correspondence to: Dr. Xuyong Lin, Department of Pathology, The First Affiliated Hospital and College of Basic Medical Sciences, China Medical University, Shenyang 110001, China. E-mail: linxuyong@hotmail.com

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