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Case Report

Follicular dendritic cell sarcoma of the tonsil with extensive amyloid deposits and pseudoangiomatous clefts: a case report

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Abstract: Follicular dendritic cell sarcoma (FDCS) is a rare tumor, which predominately occurred in lymph nodes. Histologically, FDCS typically consists of spindle to ovoid cells forming fascicles, whorled and storiform patterns with scattered small lymphocytes. Herein, we present a case of FDCS of the tonsil in a 64-year-old Chinese female. In addition to the typical morphological feature, the tumor partially showed extensive amyloid deposits and pseudoangiomatous clefts with spindle to ovoid tumor cells distributed in them. Moreover, scattered multinucleated giant cells could be observed in the tumor. Immunohistochemical staining showed that the tumor cells were positive for CD21, Vimentin, CD23 and CD35, negative for cytokeratin, EMA, Actin (SM), ALK, S-100, CD3, CD20, CD30, CD31, CD34, CD1a, CD99, Bcl-2, 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 FDCS. Our present case broadens the morphologic profile of the tumor. The unusual morphological presentation in the present case posed a diagnostic challenge, especially if the specimen is limited.

Keywords: Follicular dendritic cell sarcoma, tonsil, amyloid

Introduction

Follicular dendritic cell sarcoma (FDCS) is a rare neoplasm that predominately occurred in lymph nodes. Extranodal FDCS is extremely rare [1]. The reported cases involved extranodal sites included the oral cavity [2, 3], tonsil [4], gastrointestinal tract [5], liver [6], lung [7] and spleen [8, 9]. Typically, FDCS is histologically characterized by spindle or ovoid cells that form whorled, fascicles or storiform pattern. However, the tumor may showed the unusual morphological features including epitheloid cells, clear cells, oncocytic cells, myxoid stroma, fluid-filled cystic spaces, fibrovascular septa, perivascular spaces or multinucleated giant cells [10-14], which could pose a great diagnostic challenge. Herein, we present a case of FDCS of the tonsil in a 64 year-old Chinese female. The tumor showed extensive amyloid deposits and pseudoangiomatous clefts, which was not described in the literature. The present case could expand the morphological profile of this tumor.

Case report

Clinical history

A 64-year-old female was admitted to our hospital for complaining of a pharyngeal foreign body sensation and bloody discharge in sputum for two weeks. Laryngoscope revealed that there was a dark red neoplasm measuring approximately 1.0 cm in the diameter at the superior pole of the tonsil. Physical examination and routine laboratory studies were all within normal values. In the current visit, the patient underwent tonsillectomy in our hospital. The postoperative course was uneventful. The patient did not undergo adjuvant therapy after excision, and there was no evidence of disease 16 months later.

Materials and methods

The resected specimens were fixed with 10% neutral-buffered formalin and embedded in

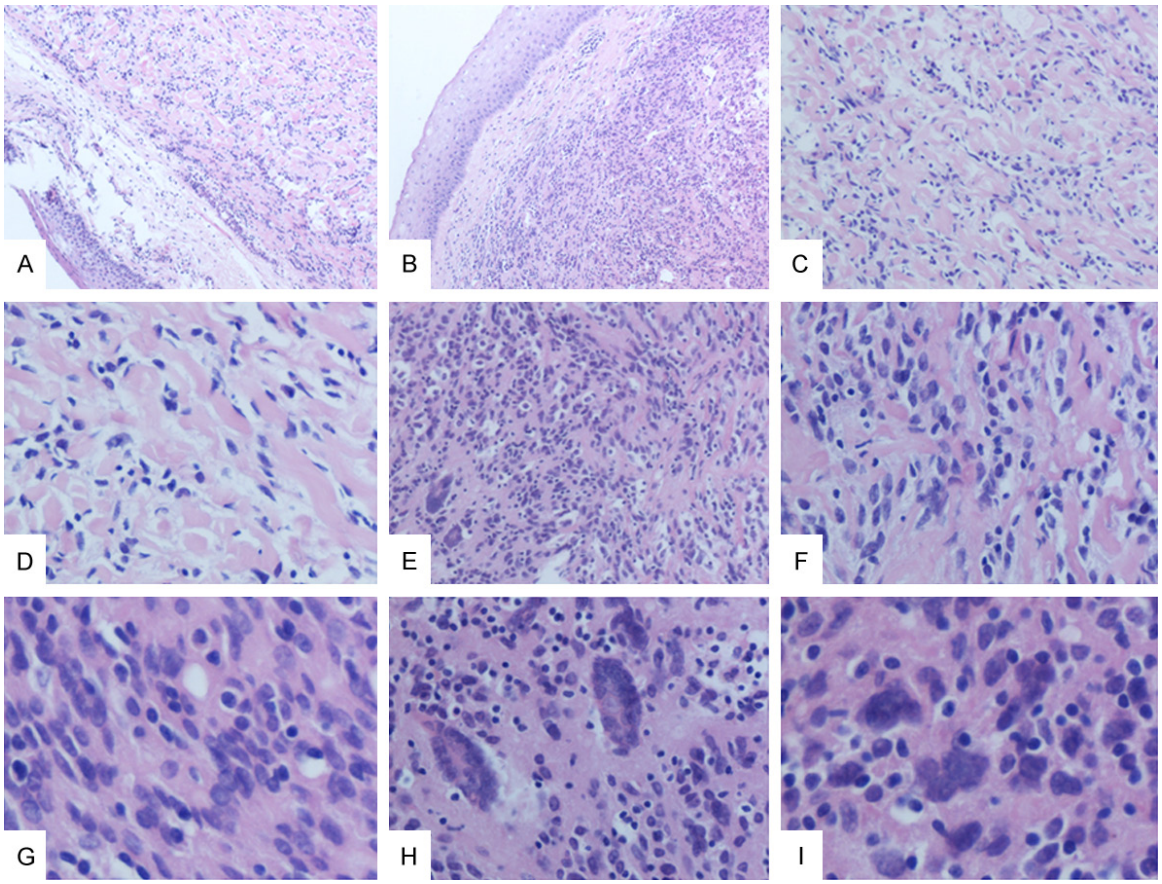

Figure 1. Morphological change of the tumor. A. The tumor was present with extensive amyloid deposits and pseudoangiomatous clefts, and covered by squamous epithelia. B. The tumor showed typical morphological presentation with sheets of cells. C. The pseudoangiomatous clefts were lined by spindle to ovoid cells resembling vascular endothelia. D. The amyloid deposits looked like irregular rope or collagen. E. The transition from the area with amyloid deposits to cellular area could be seen. F. Spindle to ovoid cells admixed with scattered lymphocytes were distributed between ropy amyloid. G. The cells possessed indistinct boundaries, hyperchromatic nuclei, and inconspicuous nucleoli. H. The nuclei of multinucleated cells were arranged into a "floret-like" pattern. I. The multinucleated cells showed the same nuclear characters with the single nuclear tumor cells.

paraffin blocks. Tissue blocks were cut into 4-μm slides, deparaffinized in xylene, rehydrated with graded alcohols, and immunostained with the following antibodies: cytokeratin (CK), CD68, Vimentin, epithelial membrane antigen (EMA), Actin (SM), P63, ALK, S-100, CD3, CD20, CD21, CD23, CD30, CD31, CD34, CD35, CD1a, CD99, Bcl-2, HMB45, Desmin and Ki-67. Sections were stained with a streptavidin-peroxidase system (KIT-9720, Ultrasensitive TM S-P, MaiXin, China). The chromogen used was diaminobenzidine tetrahydrochloride substrate (DAB kit, MaiXin, China), slightly counterstained with hematoxylin, dehydrated and mounted. For the negative controls, the primary antibody was replaced with PBS.

Results

Gross features

Grossly, the resected tonsil was approximately 2.3 × 1.8 × 1.5 cm, and there was an irregular mass measuring 0.9 × 0.7 × 0.6 on the surface of the tonsil. The cut face was firm and dark red or purple in color.

Histologic features

Histologically, the tumor was covered by the squamous epithelia, and there was an edematous or fibrous zone between the squamous epithelia and the tumor cells. The tumor was partially composed of spindle to ovoid cells

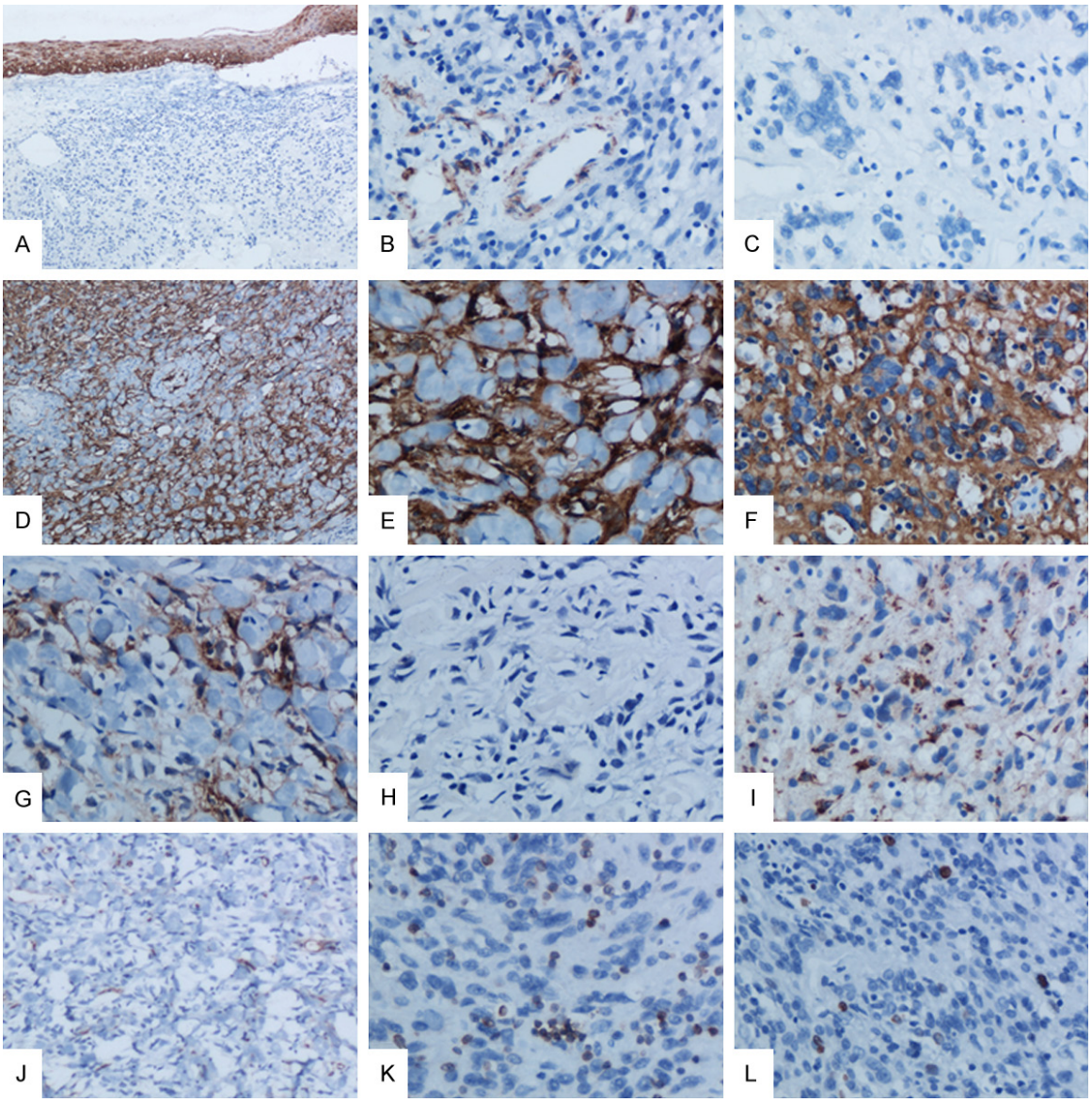

Figure 2. Immunohistochemical staining of the tumor. A. The neoplastic cells were negative for CK, in contrast to the positive expression in squamous epithelia. B. Actin (sm) was not expressed in neoplastic cells, but expressed in normal vessel. C. EMA was not expressed in the tumor. D. The diffuse and strong staining for CD21 was seen in cells of pseudoangiomatous clefts. E. The tumor also showed strong reactivity for CD23. F. The neoplastic cells including multinucleated cells showed reactivity for CD21. G. The cells showed relatively weak positivity for CD35. H. The tumor was consistently negative for S-100. I. The multinucleated cells were also negative for CD68. J. CD34 stained the true small vessels rather than the tumor cells. K. The Bcl-2 staining highlighted the presence of lymphocytes in the tumor. L. Ki-67 proliferative index was approximately 2%.

showing sheets or fasicular pattern with scattered multinucleated cells. In addition, the tumor partially showed extensive amyloid deposits and pseudoangiomatous clefts lined by spindle to ovoid cells. The amyloid looked like irregular rope. The scattered lymphocytes could also be observed between the tumor cells. The cells showed mild atypia, indistinct boundaries, hyperchromatic nuclei, and inconspicuous or small nucleoli. The mitosis of the cells is rare. The multinucleated cells showed the same nuclear characters with the single nuclear tumor cells (**Figure 1**).

Immunohistochemical staining and molecular detection

Immunohistochemical staining showed that the tumor cells were diffusely positive for CD21, Vimentin, CD23 and CD35, negative for CK,

EMA, Actin (SM), ALK, S-100, CD3, CD20, CD30, CD31, CD34, CD1a, CD99, Bcl-2, HMB45, CD68 and Desmin. Ki-67 proliferation index was approximately 2%. The multinucleated cells also showed reactivity for CD21, CD23 and CD35, rather than CD68. The lining cells of the pseudoangiomatous clefts were also positive for CD21, CD23 and CD35, negative for CD34 and CD31. CD3, CD20, and Bcl-2 staining highlighted the presence of scattered lymphocytes (**Figure 2**).

According to the morphological and immunohistochemical findings, the tumor was consistent with FDCS.

Discussion

FDCS is a relatively rare tumor deriving from follicular dendritic cells. In 1986, Monda et al. first described four cases of FDCS occurring in lymph nodes. The combination of light-microscopic, ultrastructural, and immunohistochemical features confirmed the diagnosis [15]. Subsequently, Chan et al. first reported two cases of extranodal FDCS, which occurred in the oral cavity in 1994 [3]. To date, less than one third of the reported cases occurred in extranodal sites [1]. However, a wide variety of extranodal sites including oral cavity [2, 3], tonsil [4], gastrointestinal tract [5], liver [6], lung [7], thyroid [16], breast [17], spleen [8, 9] and abdominal wall [18] were involved. Because of the rarity, the extranodal FDCS posed a great diagnostic challenge, and was often initially misdiagnosed.

It was well described for the typical histological feature of FDCS. It was characterized by spindle to ovoid cells with indistinct borders, pale or slight eosinophilic cytoplasm, oval or elongated nuclei and small nucleoli. The neoplastic cells could form storiform, fasicular, and whorled pattern. Nevertheless, the tumor rarely demonstrated the unusual morphologic features, which might be a diagnostic pitfall. Our present case showed extensive amyloid deposits and pseudoangiomatous clefts, which was not fully described in the literature. Chiaramonte et al. described a case of retroperitoneal follicular dendritic cell sarcoma presenting as secondary hepatic amyloidosis caused by the tumor [19]. Consequently, we also think that the amyloid deposits were induced by the neoplastic cells in our case. However, we had no idea about the clinical significance of amyloid deposits. In addition, Chan et al. also reported that the pseudovascular spaces were present in some tumors [3]. To our knowledge, the pseudovascular spaces described by Chan et al., which was usually fluid-filled, were not completely consistent with the pseudoangiomatous clefts in the present case, which was reminiscent of pseudoangiomatous stromal hyperplasia of the breast [20]. This might post a great challenge, especially if the specimen was limited. Thus, the present case could broaden the histological profile of the tumor.

Immunohistochemically, FDCS showed reactivity for CD21, CD23, CD35, CXCL-13, podoplanin (D2-40). Moreover, it was variably positive for EMA, S-100 and CD68 [1]. The present case was diffusely positive for CD21, CD23 and CD35, indicating the differentiation of follicular dendritic cells. The lining cells of the angiomatous clefts also stained for CD21, CD23 and CD35 rather than CD31 and CD34 indicating the presence of follicular dendritic cells rather than vascular endothelial cells. Additionally, the multinucleated giant cells were also positive for CD21, CD23 and CD35, indicating they were also tumor cells.

It was believed that FDCS was generally an indolent tumor. Chan et al. reported that local recurrence occurred in 6, metastasis in 6, and 3 died of disease among 13 patients with a median follow-up of 3 years [10]. Duan et al. analyzed 39 cases of extranodal FDCS of the pharyngeal region and found the overall recurrence, metastasis, and mortality rates were 23%, 21%, and 3%, respectively [21]. Wang et al. then reported analyze 32 patients of China, with a time interval ranging from 1 month to 5 years. The results revealed that 26 (81.2%) patients were alive and disease free after the treatment, 6 (18.8%) patients were alive with recurrent disease or metastasis, and nobody had died of this disease at the time of the last follow-up [22]. Thus, it was considered as a low grade sarcoma. It was still debated about the therapy of FDCS. According to the review by De Pas et al., localized FDCS might be effectively treated by radical surgery and did not need adjuvant treatments after radical excision [23]. The present case did not undergo any adjuvant therapy, and was alive with no evidence of tumor recurrence or metastasis within 16 months of follow-up.

The differential diagnosis of the tumor includes a variety of tumors including a variety of tumors including squamous cell carcinoma, undifferentiated carcinoma, meningioma, lymphoma, inflammatory myofibroblastic tumor and solitary fibrous tumor. Additionally, in the present case, the differential diagnosis also includes vascular tumor because of the presence of the pseudoangiomatous clefts. The correct diagnosis could be made based on histological features and immunohistochemical staining.

Conclusion

Because of the rarity, extranodal FDCS was easily misdiagnosed, especially if the tumor showed the unusual microscopic features. Our case showed extensive amyloid deposits and pseudoangiomatous clefts. The morphologic presentation was not reported in the literature, which could expand the histological profile of this tumor. It was necessary for using a variety of antibodies to make the correct diagnosis.

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Disclosure of conflict of interest

None.

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