Interdigitating dendritic cell sarcoma of lymph node mimicking granuloma: a case report and review of the literature

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Interdigitating dendritic cell sarcoma (IDCS), is an extremely rare neoplasm. We report a case of a 77-year-old man presented with gradual lymph nodes enlargement in inguina, neck and axilla for 6 months. Biopsy revealed that part of the lymph node was replaced by several large granuloma-like nodules composed of mild atypical tumor cells, resembling epithelioid cells. Mitotic figures were hardly found. Immunohistochemistry showed that tumor cells were positive for S-100, CD68 and CD45. Ki-67 labeling index was 5%. To the best of our knowledge, this is the first case of IDCS showing granuloma-like growth pattern with mild atypical tumor cells.

Key words: hematology, interdigitating dendritic cell sarcoma, granuloma.

Introduction

Interdigitating dendritic cell sarcoma (IDCS) is considered to be a neoplastic proliferation of cells with phenotypic characteristics of interdigitating dendritic reticulum cells (IDC) [1]. IDCs are located in the T-cell areas of the lymph node, tonsil, spleen, and medulla of the thymus. Through surface major histocompatibility complex–peptide complexes, these cells are responsible for stimulating resting T cells in the initiation of strong cellular immunity [2, 3].

Interdigitating dendritic cell sarcoma is extremely rare. There are only 60 cases reported so far. IDCS usually forms fascicles, a storiform pattern, and whorls of spindled to ovoid cells [4, 5]. We report a case of lymph node IDCS showing granuloma-like nodules with mild atypical tumor cells and a review of literatures on IDCS. To the best of our knowledge, this growth pattern of IDCS has not been reported before. Our case expands the morphologic spectrum of IDCS.

Case report

A 77-year-old man presented with a 6-month history of gradually enlarging painless mobile lymphadenopathy in the inguina, neck and axilla with no systemic symptomatology. He was otherwise in good health and denied having constitutional symptoms. Physical examination showed a group of firm and painless masses. The largest one measured 3.5 cm in diameter. Other investigations including a complete blood cell count as well as renal and liver function tests were all normal. The HIV antibody test was negative.

Macroscopically, the received lymph node measured 3.5 × 2.0 × 2.0 cm and was firmed, relatively circumscribed, and white to tan on cut surface.

Microscopically, the architecture of lymph node was partly replaced by several large granuloma-like nodules composed of mildly atypical tumor cells, resembling epithelioid cells (Figs. 1, 2). The tumor cells were oval to spindle with vesicular nuclei, inconspicuous nucleoli, and abundant slight eosinophilic cytoplasm, nuclear grooves were not detected (Fig. 3). Mitotic figures were hardly found. Multinucleated giant cells were not identified. Small mature lymphocytes, plasma cells and scattered eosinophils were intermixed with tumor cells. There was no necrosis or hemorrhage. The uninvolved area of the lymph node showed shrunken follicles with small germinal centers and expanded parafollicular area composed of small lymphocytes. Medullar sinuses were dilated.

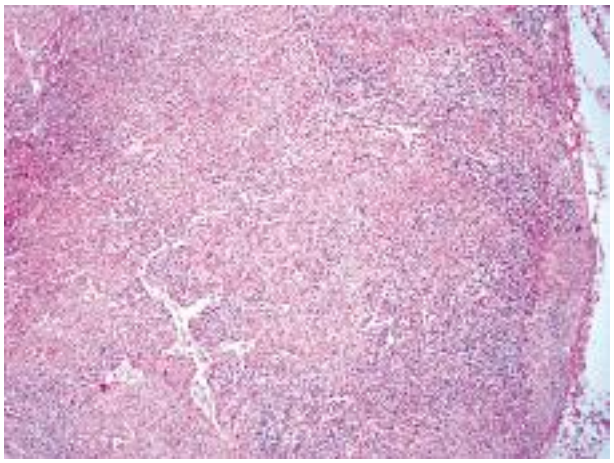

Fig. 1. The structure of the lymph node was partly destructed by several large granuloma-like nodules (HE, original magnification 40×)

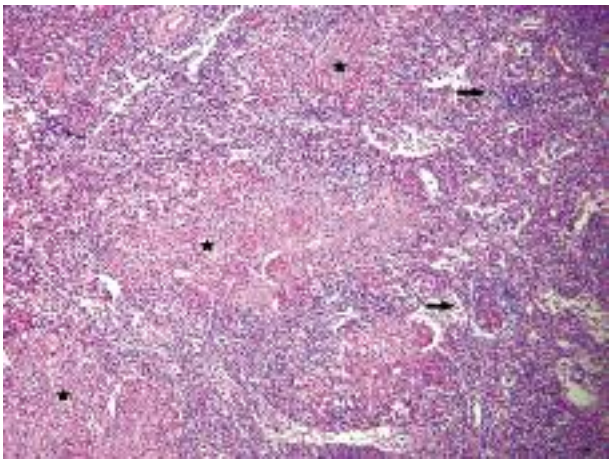

Fig. 2. Several granuloma-like nodules (stars) replaced part of the lymph node, with shrunken follicles (arrows) and dilated sinus in the uninvolved area. (HE, original magnification 40×)

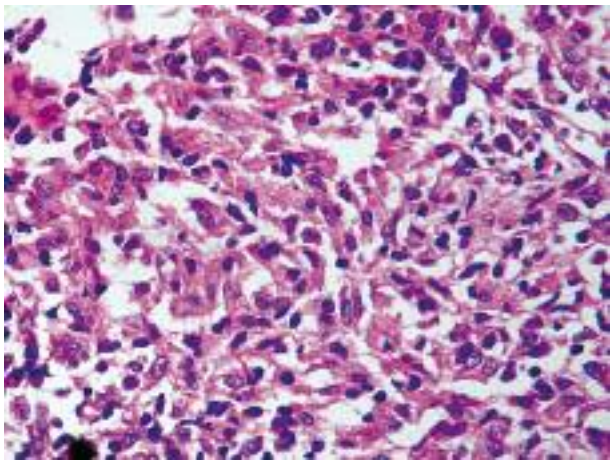

Fig. 3. Tumor cells were oval to spindle in shape with abundant cytoplasm, resembling epithelioid cells, intermixed with small mature lymphocytes and plasma cells (HE, original magnification 200×)

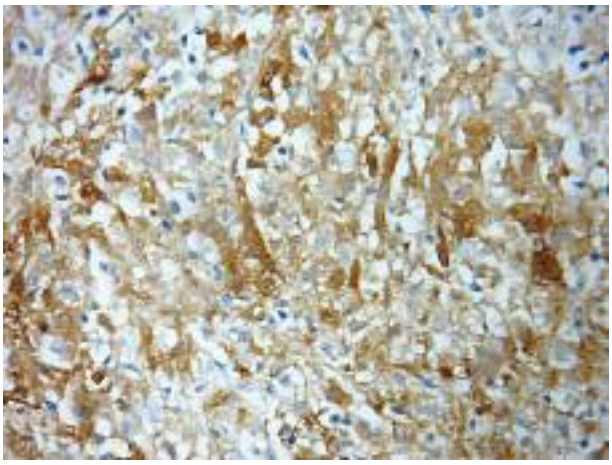

Fig. 4. Tumor cells showed cytoplasmic immunoreactivity for S-100 protein (envision, 200×)

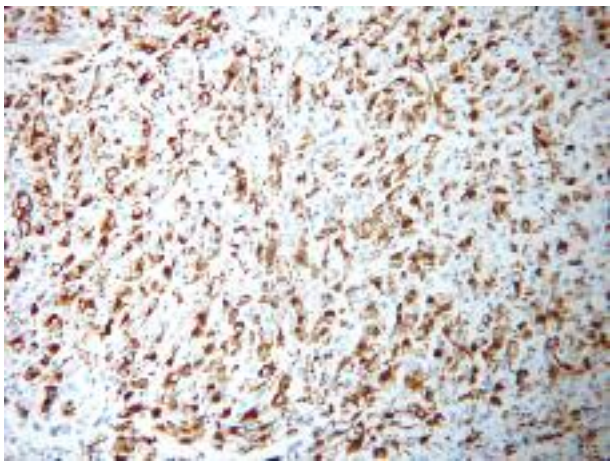

Fig. 5. Tumor cells were positive for CD68 (envision, 100×)

Immunohistochemically, the tumor cells were moderately to strongly immunoreactive for S-100 protein in the cytoplasm (Fig. 4). They were also positive for CD45, CD68 (Fig. 5) and negative for CD20, CD79a, CD3, CD45RO, CD34, CD117, MPO, CD1a, Langerin, lysozyme, CD21, CD23, CK and HMB-45. Approximately 5% of the tumor cells showed immunoreactivity for Ki-67. *In situ* hybridization for EBV-encoded RNA was negative both for spindle tumor cells and scattered small lymphocytes.

Based on the above findings, the enlarged lymph node was diagnosed as interdigitating dendritic cell sarcoma (IDCS). The patient underwent surgery dissection. The postoperative course was uneventful and no adjuvant therapy was given. The patient had been followed up for 1 year after surgery until he was lost to

be contacted. During the period of follow-up, no sign of recurrence and metastatic disease was found.

Discussion

The IDCS are rare tumors derived from interdigitating dendritic cells. There are only about 60 cases of IDCS reported so far in the English literature. The median age at presentation is 51.7 years (range = 2-88 years). The sex distribution is almost equal (male/female, 33 : 28). Although the predilection sites are lymph nodes, about one third of the cases occurred in extranodal sites including nasopharynx, small intestine, mesentery, spleen, testis, skin, tonsil and bladder [6]. Patients usually present with painless lymph node enlargement or extranodal masses. Systemic symptoms including fever, weight loss, fatigue or night sweats are rarely reported.

Microscopically, IDCS usually shows a diffuse proliferation of medium to large spindle cells with a fascicular or whorled growth pattern. The individual cells are oval to spindle with abundant cytoplasm, vesicular nuclei and conspicuous nucleoli. Cytologic atypia varies from case to case [7, 8]. Sometimes multinucleated giant cells can be found. The mitotic figures are variable but usually few in number (less than 5 per 10 high-power fields) [9]. Necrosis is unusual [8]. One diagnostically valuable feature of IDCS is the presence of a variable number of lymphocytes and plasma cells intermingled with tumor cells [7, 10]. Interestingly, a unique growth pattern occurred in the present case. The tumor cells aggregated forming granuloma-like nodules, replacing part of the lymph node. The tumor cells showed mild atypia, resembling epithelioid cells. Mitotic figures were hardly found. The granuloma-like growth pattern of IDCS has never been reported before.

The diagnosis of IDCS can be confirmed with the use of immunohistochemistry. The tumor cells are positive for S-100 protein, LCA, HLA-DR and CD68, negative for B-cell and T-cell markers, CD21, CD23, CD35 and CD1a [7, 8, 11]. The ki-67 labeling index usually ranges between 10% and 20% [6]. Variable degrees of staining have been reported for CD11c, CD4, CD14 and EMA [12, 13]. The background small lymphocytes are predominantly CD3+ T-cells with only very few CD20+ B-cells [10].

The differential diagnosis of IDCS is broad, including both nonneoplastic and neoplastic entities according to morphology of the individual case. As the presence of granuloma-like nodules and bland tumor cells resembling epithelioid cells in the reported case, lymphadenopathy with granuloma formation, such as tuberculosis and sarcoidosis, should be excluded. The tuberculous granuloma is usually composed of a necrotic center and concentric areas of epithelioid cells, Langerhans giant cells and lymphocytes. Acid-fast bacilli can be demonstrated by histochemistry. The epithelioid cells are positive for CD68, lysozyme, but negative for S-100 [14]. Sarcoidosis lymphadenopathy shows closely packed, well-demarcated graulomas. Asteroid bodies may be present within multinucleated giant cells [14]. Histiocytes in sinus histiocytosis with massive lymphadenopathy (SHML) share a similar immunophenotype with IDCS, which are positive for S-100, CD68, negative for CD1a, Langrin. However, the involved lymph node exhibits marked dilated sinuses containing large and irregularly shaped histiocytes which engulf lymphocytes, plasma cells or erythrocytes [15, 16]. Inflammatory pseudotumour is composed of fascicles of spindle cells, along with inflammation and small vessel formation in the lymph node capsule, with extension along trabeculae of the node. The lack of morphological atypia and aggressive growth pattern, and the presence of a polymorphic cell population can distinguish from IDCS [13]. Follicular dendritic cell sarcoma may show similar appearance with IDCS, however there is CD21 and CD35 positivity in the neoplastic cells. In addition, diffuse strong clusterin staining is present in follicular dendritic cell sarcomas in comparison with IDCS [17, 18]. Melanoma should be always considered, which is S-100+. Tumor cells usually showed high pleomorphism, and were positive for HMB-45 and Melan-A.

The clinical behavior of IDCS is variable. Although most cases were aggressive with widespread masses and rapidly fatal course [19-21], there were some cases presented as localized or progressing slowly. Rupar *et al*. [22] have reported a case of a 71-year-old man with IDCS in urinary bladder who stayed healthy without evidence of tumor 6 years after surgery. Ishihara *et al.* [23] have reported a case of 47-year-old man with IDCS in the ileum without being treated with chemotherapy after the operation. It has been three years without signs of tumor before recurrence occurred. Heterogeneous biological behavior may exist in IDCS. In the presented cases, there may be a correlation between the bland appearance in morphology and the indolent behavior of the tumor. However the most reliable prognostic factors remain unknown yet. Histological features suggestive of aggressive biology, including necrosis, mark nuclear pleomophism, abnormal mitosis, and high mitotic activity and high proliferative index (Ki-67 labeling), do not seem to correlative with survival in the literatures [6]. A large cohort of cases study is needed to clarify causes of heterogeneous clinical behavior and the reliable prognostic factors of IDCS.

In conclusion, we described a case of IDCS in the lymph node showing a granuloma-like nodules composed of bland oval to spindle tumor cells, resembling epithelioid cells with rare mitotic figures. Our case expands the morphologic spectrum of IDCS.

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