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Case Report

Complete response after chemotherapy and radiotherapy of a tonsillar histiocytic sarcoma with regional lymph node involvement: a case report and review of the literature

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Abstract: We describe a case of tonsillar histiocytic sarcoma (HS) with regional lymph node involvement and complete response after multi-disciplinary therapy. Immunohistochemistry showed strong positive tumor staining for CD 68, and negative staining for CD20, CD45R0 and CD30 and non-cohesive proliferation of neoplastic histiocytes. Systemic chemotherapy with cyclophosphamide, doxorubicin, vincristine, prednisone, and etoposide (CHOP-E) chemotherapy followed by radiotherapy was delivered to the patient. No evidence of recurrent disease existed on regular follow up three years later. The diagnostic methods and the practical treatment solutions are discussed here. We believe that although HS has been regarded as a potentially fatal disease entity, there remain some cases that do not pursue such an aggressive clinical course.

Keywords: Histiocytic sarcoma, tonsillar, chemotherapy, radiotherapy, survival outcome

Case report

In January 2010, Mr. YW, a 23-year-old man, presented to the Fudan University Shanghai Cancer Center (FUSCC) with a two-week history of an enlarged lymph node in his left upper neck. The medical case notes from his referring local hospital indicated that he developed symptoms of pharyngitis (such as persistent discomfort and scratchiness of his throat) two months prior to his initial hospital admission. At that time, physical examination recorded that his left tonsil was asymmetrically enlarged and nodules of 0.5 cm in diameter were present on its surface. His past medical, social and family history were unremarkable. He was subsequently treated with a left tonsillectomy on December 16, 2009 at his local hospital. Following the surgery, he consulted for a second opinion at the FUSCC. A histo-pathological review of the tonsillectomy specimen was performed by the senior pathologist. All pathological slides from the referring hospital were reviewed, and the diagnosis of histiocytic sarcoma of the tonsil was confirmed. Immunohistochemistry examination showed strong positive tumor staining for CD 68 (**Figure 1**) and negative staining for CD20, CD45R0 and CD30. Hematoxylin-eosin (HE) staining showed non-cohesive proliferation of neoplastic histiocytes (**Figure 2**).

At his first clinic visit at the FUSCC, the patient presented with an enlarged lymph node in the left upper neck measuring 2.5 cm in diameter. A fine needle aspiration of the node was performed, and cytological examination of the specimen indicated the presence of malignant tumor cells, consistent with the preceding diagnosis of histiocytic sarcoma of the left tonsil. Gadolinium-enhanced magnetic resonance imaging (MRI) of the head and neck showed evi-

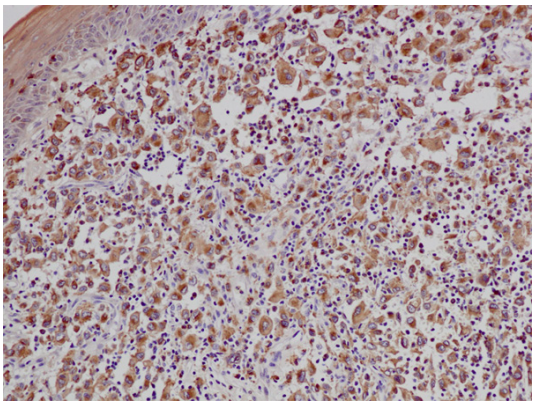

Figure 1. Immunohistochemical examination showed strong positive tumor staining for CD 68.

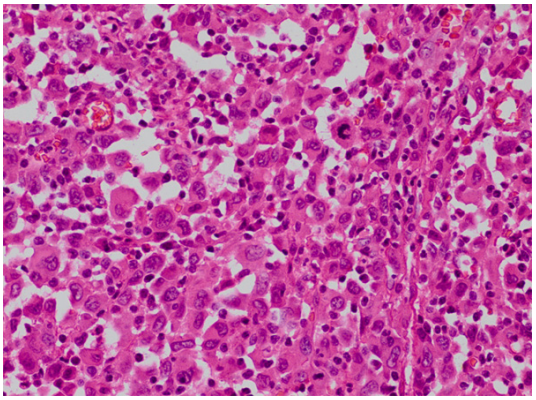

Figure 2. Hematoxylin-eosin (HE) staining showed non-cohesive proliferation of neoplastic histiocytes.

dence of previous left tonsillectomy. No abnormal findings were found in the oropharynx and nasopharynx. Left cervical lymphadenopathy was noted, which was suspicious for metastatic lymph nodes (**Figure 3**). Computed tomography scans of the chest, abdomen, and pelvis did not reveal any distal metastases. The patient was subsequently referred to the lymphoma multi-disciplinary team (which consisted of hematologists, medical oncologists and radiation oncologists) at the FUSCC. After extensive discussion, the panel recommended systemic chemotherapy with cyclophosphamide, doxorubicin, vincristine, prednisone, and etoposide (CHOP-E) chemotherapy followed by radiotherapy. The patient was scheduled to receive six cycles of CHOP-E from February to June 2010. After four cycles of chemotherapy, a gadolinium-enhanced MRI of the head and neck showed complete radiological remission with complete disappearance of left neck lymph-

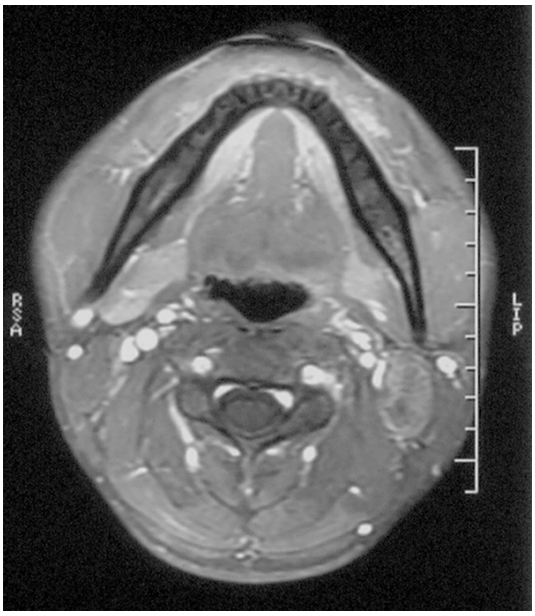

Figure 3. Before treatment, the patient presented with an enlarged lymph node in the left upper neck measuring 2.5 cm in diameter.

adenopathy (**Figure 4**). Two additional cycles of CHOP-E were then delivered as consolidation treatment for a total of six cycles of chemotherapy. Involved-field radiotherapy including Waldeyer's ring and left neck was then applied two weeks after completion of chemotherapy to a dose of 50 Gy in 25 fractions at 2 Gy/fraction over five weeks. The patient tolerated the entire treatment very well, with Grade 3 mucositis and Grade 1 xerostomia immediately after the completion of radiotherapy (based on the Common Toxicity Criteria for Adverse Events Version 3.0). Three years later, the patient exhibited complete resolution of xerostomia and no evidence of recurrent disease or remnants on regular follow-up.

Discussion

In accordance with the World Health Organization classification [1], histiocytic sarcoma (HS) is defined as a malignant proliferation of cells with morphologic and immune-phenotypical features similar to mature histiocytes. HS represents a rare malignant entity that accounts for less than 1% of hematologic malignancies. The majority of lesions were reported to present at extra-nodal sites, most frequently in the intestinal tract, soft tissues and skin [2-4], with sporadic cases arising from the cen-

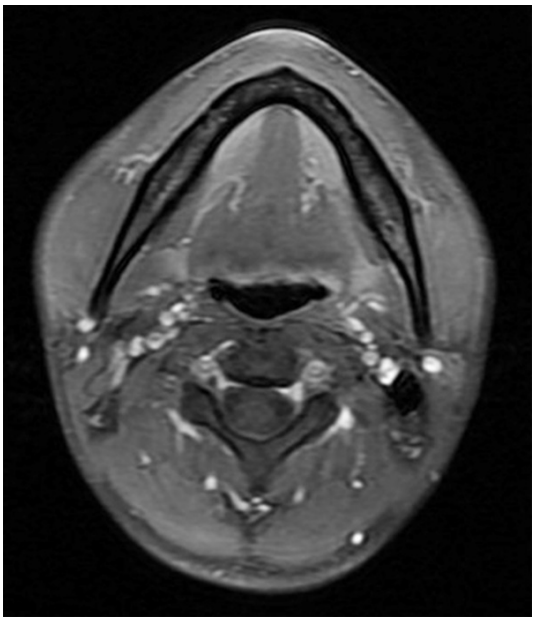

Figure 4. After four cycles of chemotherapy, a gadolinium-enhanced MRI of the head and neck showed complete disappearance of the left neck lymphadenopathy.

tral nervous system [5], thyroid [6] and other sites [7]. Other authors noted that HS may be associated with malignant lymphoma and leukemia, presenting either before or subsequent to HS [8, 9]. Before the development and widespread use of immunohistochemistry and the availability of molecular tools, the diagnosis of "histiocytic sarcoma" was ambiguous and uncommon and was sometimes referred to as "malignant histiocytosis" and "true histiocytic lymphoma." In this context, although the term HS was first introduced by Mathe et al in 1970 [10], it is difficult to retrieve and interpret the diagnosis and treatment information from papers published nearly two decades ago.

The development of immunohistochemistry facilitated the identification of the origin of the tumor tissue and led to a better understanding and refinement of diagnosis and treatment. Until now, the International Lymphoma Study Group emphasized the use of a panel of several immunophenotypic markers (e.g., CD68, CD1a, S-100, CD 21, CD35) to correctly identify cases of true HS and dendritic cell sarcomas. Most recently, Vos et al showed that the hemoglobin scavenger receptor (CD163) is a specific marker for cells of histiocytic origin. To date, CD163 and CD68 appear to be the best markers for HS [11].

The treatment protocols reported in the published literature have been diverse, with patients being treated on an individual basis. This was attributed to the extremely low incidence of HS in the general population and the lack of studies with sufficient patient numbers. Currently, there are limited treatment options for HS, and no standard treatment can be recommended. Surgery and/or chemotherapy are the most commonly employed treatment modalities for HS, while radiotherapy seems to be an effective option in patients with localized lesions.

Hornick et al reported a case series of 14 patients in which the majority presented with localized disease [3]. All patients received upfront surgical intervention for either diagnosis or treatment. The initial adjuvant treatments consisted of radiotherapy (4 patients) and/or chemotherapy (6 patients) with a CHOP (cyclophosphamide, doxorubicin, vincristine, and prednisone) regimen. Ten patients had sufficient follow-up data (median follow-up of 24 months; range, 4 months to 11 years). Of these 10 patients, five patients (50%) developed distal metastases, and two patients with bulky primary tumors (20%) died of the disease. This is compared to a case series from the International Lymphoma Study Group, where 18 malignant histiocytic tumors were reported: 15 cases of histiocytic sarcomas and 3 of malignant histiocytosis with disseminated disease. Nine patients (50%) had stage III or stage IV disease, and seven patients (58%) eventually died of the disease [12]. The substantial differences in the overall survival between these two datasets could be attributed to the differing extent/stage of disease of the enrolled patients, with the latter study enrolling more patients with advanced tumors.

The outcomes after treatment are poor for HS, especially in those with advanced or disseminated disease. Novel agents have been applied and appear to be promising. Recent reviews reported the use of thalidomide in patients with HS after systemic failure. Thalidomide is thought to mediate anti-tumor responses through a variety of mechanisms, including those involving anti-angiogenic, anti-proliferative, pro-apoptotic, and immune-modulating pathways. Following a relapse after chemotherapy and allogeneic stem cell transplant for T-cell acute lymphoblastic leukemia and syn-

chronous HS, a 4-year-old child was treated with thalidomide for 33 months, with the disappearance of the majority of the tumors [13]. Thalidomide also showed effectiveness in a 48-year-old female presenting with disseminated HS and suffering a relapse after allogeneic stem cell transplantation [14]. Recently, a 64-year-old female with multiple lymph nodes in her abdomen and thoracic cavity was diagnosed with HS and treated with thalidomide and CHOP, followed by autologous stem-cell transplantation. With maintenance thalidomide therapy, there was no evidence of disease recurrence after 6 months of follow-up [15].

The patient presented in this paper had clinically localized disease with the involvement of a regional lymph node. To our knowledge, this is the first HS case with primary involvement of the tonsil that was successfully treated with a combination of CHOP-E chemotherapy and adjuvant radiotherapy. Although HS has been regarded as a potentially fatal disease entity, there remain some cases that do not pursue such an aggressive clinical course. The excellent response and favorable outcome of our patient with combined chemotherapy followed by radiotherapy should promote future research to explore the use of novel treatment protocols in patients with localized or favorable subtypes of HS.

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Written informed consent was obtained from the patient for publication of this Case report and any accompanying images. A copy of the written consent is available for review by the Editor-in-Chief of this journal.

Disclosure of conflict of interest

None.

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