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Omental Histiocytic Sarcoma
- A Case Report -

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We report a case of perigastric histiocytic sarcoma (HS) involving the lesser omental sac in a 30-year-old man. HS is an exceedingly rare malignancy of mature tissue histiocyte. The tumor was a multi-lobulated, bulging enhancing mass in the lesser omentum with metastasis to lymph nodes and liver. The tumor consisted of diffuse non-cohesive proliferation of pleomorphic large oval to round neoplastic cells with giant cells showing vesicular chromatin and ample eosinophilic cytoplasm. In some areas, the tumor cells showed spindling with elongation of the nuclei and cellular shapes. Many of the tumor cells, especially giant forms contained phagocytosed lymphocytes. Immunohistochemical analysis of the tumor cells showed expression of leukocyte common antigen, CD68, lysozyme, vimentin, CD4, and CD163. Ki-67 index was 50-60%. After the operation, he was treated with chemotherapy, but the response was poor.

Key Words : Sarcoma; Histiocytic sarcoma; Omentum

Histiocytic sarcoma (HS) is an exceedingly rare malignancy of mature tissue histiocytes.[1-3] Most patients with HS are adults. Both nodal and extranodal, especially in the skin and gastrointestinal tracts, presentations have been reported. Due to the morphologic similarity, many B-cell or T-cell lymphomas had been designated as 'histiocytic' in the past.[4] Most patients present in advanced stages, and systemic symptoms are common. The prognosis is guarded with poor response to chemotherapy. Histologically, HS is homogeneous with non-cohesive proliferation of large cells. Diagnosis of HS requires demonstration of histiocytic markers and the absence of dendritic, lymphoid, epithelial and melanocytic phenotype. Although HS is a neoplasm of phagocytic histiocytes, hemophagocytic syndromes are not prominent in HS.

HS is typically a localized mass without leukemic manifestations as seen in monocytic leukemia.[4] Some HS cases are associated with mediastinal germ cell tumor, malignant lymphoma or myelodysplasia.

In this report, a case of HS of the lesser omentum in a 30-year-old male with prominent emperipolesis and myxoid degeneration is presented with a review of the literature.[1,4-7]

CASE REPORT

A 30-year-old man presented with a history of abdominal pain and dyspepsia for eight months. He denied nausea, fever, weight loss, or night sweats. No skin lesions were identified. Past medical history revealed a history of laparotomy for a perforated duodenal ulcer 10 years ago. Upon physical examination, a vague upper abdominal mass was palpated. There was no hepatosplenomegaly. Laboratory findings included mild normocytic normochromic anemia, mild leukopenia, relative monocytosis (neutrophil 43%, lymphocytes 38%, monocytes 13%, eosinophil 1%, basophil 5%), hemoglobin 10.6 g/dL, hematocrit 33.4%, MCV 84.1 fL, MCH 26.7 pg, MCHC 31.7 g/dL, platelet $294 \times 10^3/mm^3$, WBC $5.6 \times 10^3/mm^3$, reticulocyte 0.36%, glucose 211 mg/dL, alkaline phosphotase 221 (40-120) IU/L, AST 30 IU/L,

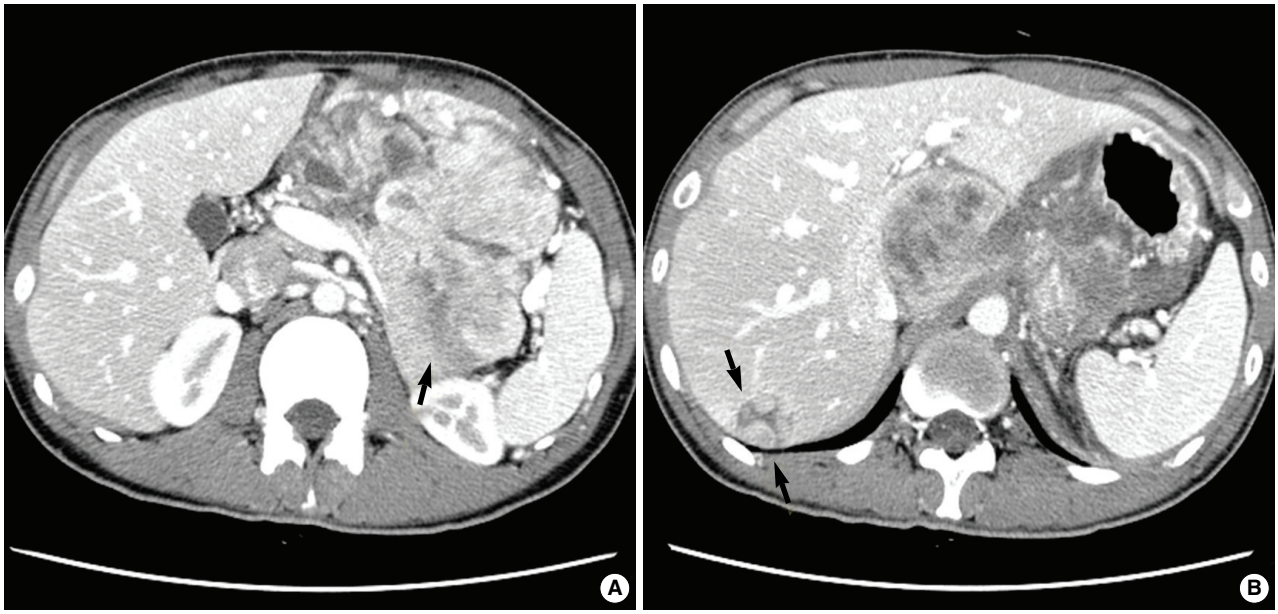

Fig. 1. Abdominal CT scan shows lesser sac omental mass (A, arrow) and a metastatic nodule with heterogeneous peripheral enhancement at hepatic segment VII (B, arrows).

ALT 17 IU/L, CRP 4.37 (0-0.6 mg/dL).

Abdominal CT scan showed multiple lobulated, enhancing masses with heterogeneous density in the lesser omental sac, and a 3 cm-sized metastatic mass in the liver (Fig. 1). Perigastric and omental lymph nodes were enlarged. During a laparotomy, a debulking operation of the lesser sac mass with total gastrectomy was done, and a liver wedge resection was done, but the tumor was not completely resected. Grossly, the tumor consisted of multinodular and irregular soft masses (11 × 8 × 5 cm). The mass extended to the gastric submucosa. The cut surfaces of the masses were yellowish tan, soft and focally necrotic (Fig. 2).

Microscopically, the tumor consisted of diffuse non-cohesive proliferation of pleomorphic large oval to round cells. And the tumor had somewhat eccentric nuclei showing vesicular to irregularly clumped chromatin and prominent pleomorphic nucleoli. The cytoplasm was ample, eosinophilic, or finely foamy and pale. There were many bi-nucleated and multinucleated giant cells. In some areas, the tumor cells showed prominent spindling with elongation of the nuclei and cell shape. There was variable infiltration of small lymphocytes, eosinophils, neutrophils, and macrophages. Emperipolesis, the presence of lymphocytes in the tumor cell cytoplasm, was observed throughout the tumor especially in larger, giant forms of tumor cells (Fig. 3). There was necrosis and myxoid degeneration in some areas in which the tumor cells were small and degenerating with inconspicuous nuclear details suggesting cellular death. The tumor had infiltrated the stomach proper muscle and metastasized to liver.

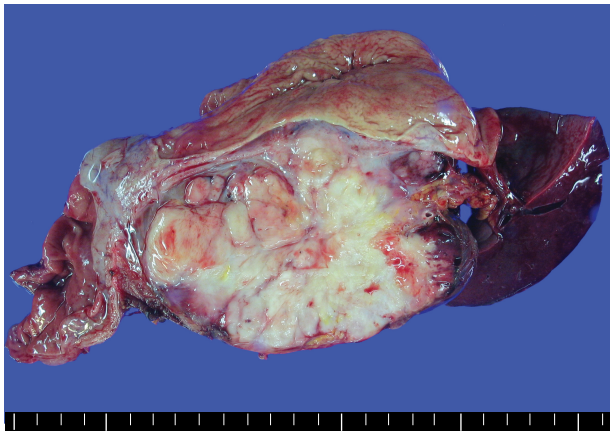

Fig. 2. The tumor is relatively well-circumscribed, solid and yellowish to white in color.

By immunohistochemical analysis, the tumor cell phenotype was as follows: LCA (+), CD68 (+), vimentin (+), lysozyme (+), CD4 (+), CD163 (+), CD8 (-), CD1a (-), CD20 (-), CD79 (-), CD21 (-), CD23 (-), CD34 (-), CD30 (-), CD45RO (-), CD117 (-), MPO (-), SMA (-), S100 (-), CK (-), HMB45 (-), desmin (-), and ALK-1 (-), synaptophysin (-), chromogranin (-), and HLA/DR (-). Lysozyme staining was granular cytoplasmic with Golgi accentuation (Fig. 4A). Ki-67 index was 50-60%. Epstein-Barr virus was not present by *in situ* hybridization (ISH) for Epstein-Barr virus encoded RNA (EBER). Bone marrow was not examined because the patient refused.

Post-operative course was not good with leakage at the anas-

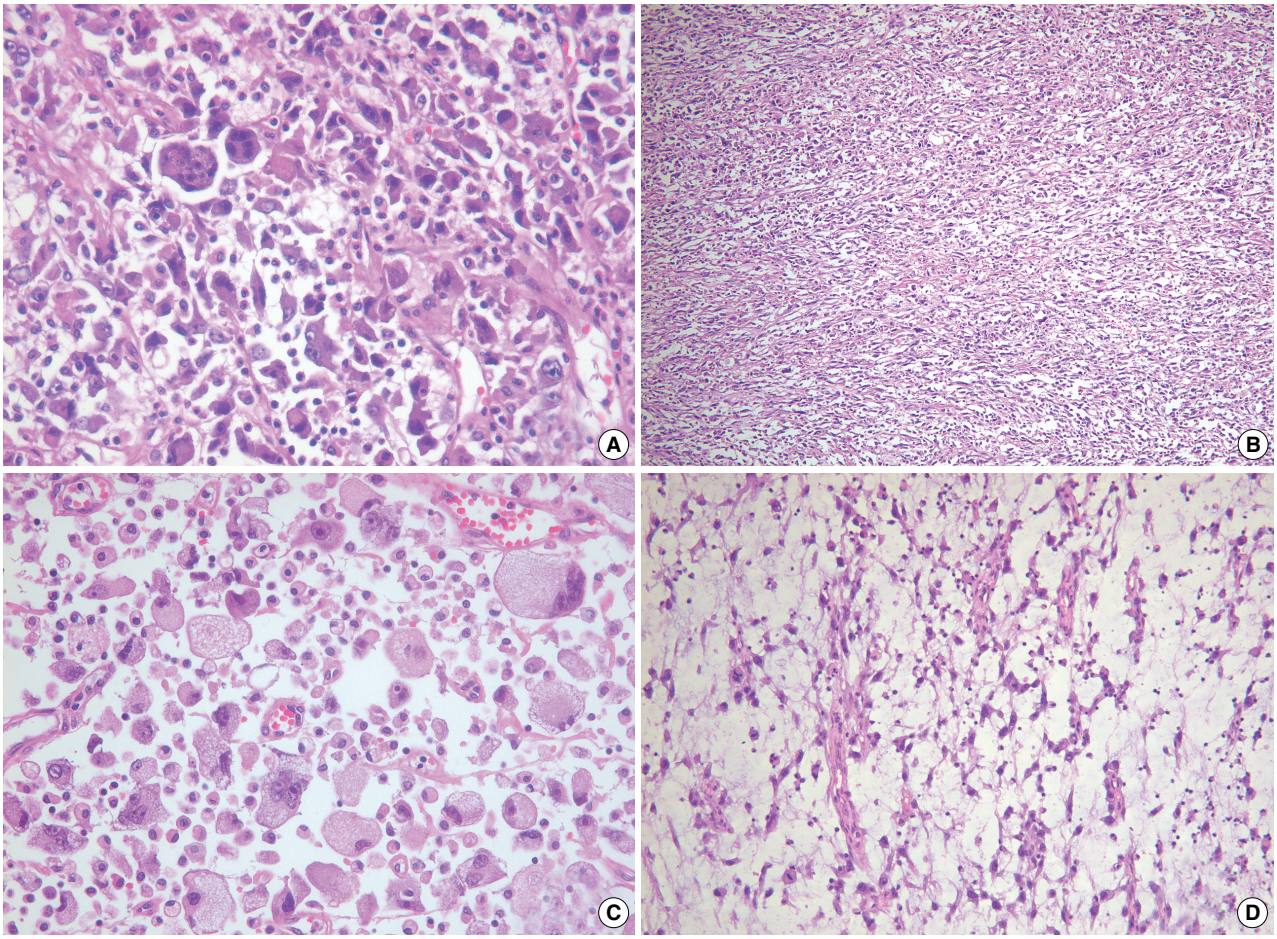

Fig. 3. Non-cohesive proliferation of neoplastic cells showing bizarre multinucleated cells (A). In some areas, the tumor cells are spindled with fasciculation, resembling malignant fibrous histiocytoma (B), and they also show foamy cell appearance (C), and myxoid degeneration (D).

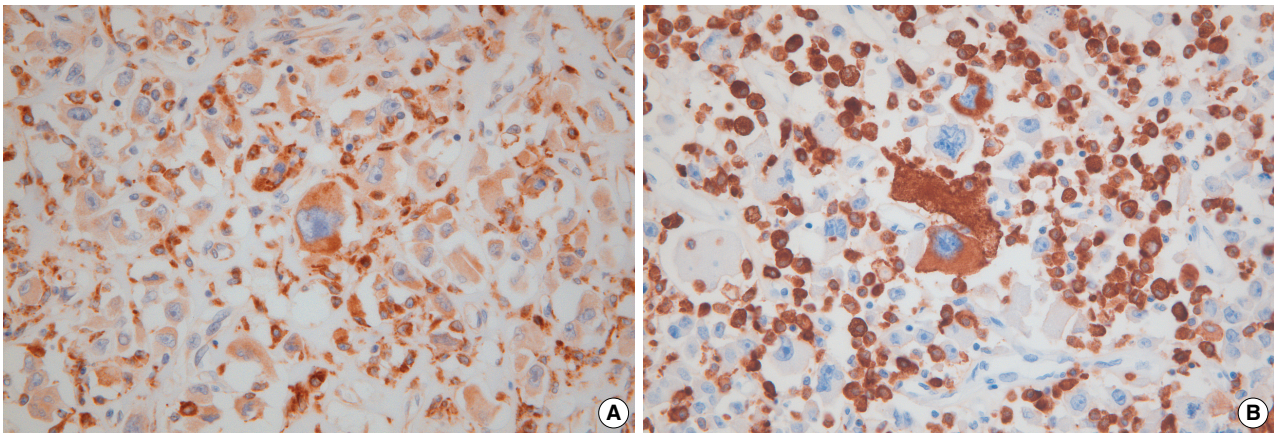

Fig. 4. (A) Lysozyme immunostaining is granular cytoplasmic with Golgi accentuation. (B) The immunohistochemial stain for hemoglobin scavenger receptor protein CD163 is positive is the cytoplasm.

tomosis site and no response to adjuvant chemotherapy (with Gemzar and cisplatin), and the patient expired two months after the surgery.

DISCUSSION

With the development and ready availability of immunohis-

tochemical and molecular techniques in recent years, most 'histiocytic' tumors have been proven to be of lymphoid origin, and HS has become an extremely rare diagnosis.[4,5,7]

Monocytes and related cells are divided into two categories: antigen-processing phagocytes and antigen-presenting accessory dendritic cells.[4,5] Blood monocytes migrate to the tissues and become histiocytes, the non-circulating phagocytes that remove and process particulate antigens.[4] HS is a malignancy of mature tissue histiocytes.

A fair number of cases in the gastrointestinal tracts have been described,[1,4-6] in which the tumors arose in the wall of the bowel with invasion and ulceration of the overlying mucosa or causing intussusception resulting in ulcer. In the present case, the epicenter of the tumor was in the lesser omentum invading the gastric submucosa and subserosal portion of muscularis propria without invading the gastric mucosa.

Histologically, the present case was typical of HS as previously described. One notable feature was the prominent emperipolesis throughout the tumor while no erythrophagocytosis was observed. Although HS is a malignancy of histiocytes, phagocytic activity is not a prominent feature of malignant cells of HS.[1,4-6] Instead, benign activated macrophages are mainly responsible for hemophagocytic syndrome and pancytopenia seen in advanced cases of HS. In the present case, the patient's blood cell counts were relatively well maintained throughout the course. Another characteristic feature of the present case is the myxoid degeneration adjacent to necrotic foci in which tumor cells were in the process of death suggesting that myxoid degeneration precedes necrosis.

Although the histological appearance of HS has some common characteristics, it is not specific and requires extensive immunohistochemical work-up. Differential diagnoses include acute monoblastic leukemia, malignant fibrous histiocytoma, follicular dendritic cell sarcoma and interdigitating dendritic cell sarcoma (IDCS) in addition to undifferentiated carcinoma and melanoma. Demonstration of histiocytic markers and leukocyte common antigen (CD45) is essential without any evidence of myeloid, epithelial, melanocytic and dendritic cell differentiation.[1,4,5] Histiocytes typically express lysosomal antigens including CD68 and lysozyme, CD4, CD45RO, and T-cell activation markers CD25, and HLA-DR.[4] The phenotype of the present case is fairly characteristic of HS, especially, the partly positive staining of the hemoglobin scavenger receptor protein CD163 which is a dependable biomarker for the histiocytic nature of the tumor (Fig. 4B).[1,4-6] Other tumors were ruled out by the absence of myeloperoxidase (acute monoblastic leukemia), EMA and cytokeratin (carcinoma), HMB45 and S-100 protein (melanoma), CD21 and CD23 (follicular dendritic cell tumor), CD1a and S-100 protein (IDCS), and the absence of B- and T-cell markers (lymphomas). Malignant fibrous histiocytoma was also ruled out by the expression of LCA. Histologically, the presence of the prominent spindling area eliminated the possibility of acute monoblastic leukemia.

HS is an aggressive disease with poor response to treatment, and most patients die of this progressive disease.[4] In the present case the tumor was not completely resectable and with development of wound problems and resistance to chemotherapy, the patient expired shortly after the operation. A small minority of patients with HS may have a better overall survival rate even possibly a cure. The most important prognostic factors are stage, tumor size, and the completeness of resection.[1,4-6]

REFERENCES

1. Hornick JL, Jaffe ES, Fletcher CD. Extranodal histiocytic sarcoma: clinicopathologic analysis of 14 cases of a rare epithelioid malignancy. Am J Surg Pathol 2004; 28: 1133-44.
2. Park MI, Song KS, Kang DY. Histiocytic sarcoma of rectum: a case report. Korean J Pathol 2006; 40: 156-9.
3. Paik JH, Jeon YK, Park SS, *et al.* Hitiocytic sarcoma of the spleen: a case report and review of the literature. Korean J Pathol 2005; 39: 356-9.
4. Weiss LM, Grogan TM, Müller-Hermelink H-K, *et al.* Histiocytic sarcoma. In: Jaffe ES, Harris NL, Stein H, Vardiman JW, eds. World Health Organization classification of tumours. Pathology and genetics of tumours of haematopoietic and lymphoid tissues. Lyon: IARC R-ess, 2001; 30: 278-9.
5. Pileri SA, Grogan TM, Harris NL, *et al.* Tumours of histiocytes and accessory dendritic cells: an immunohistochemical approach to classification from the International Lymphoma Study Group based on 61 cases. Histopathology 2002; 41: 1-29.
6. Vos JA, Abbondanzo SL, Barekman CL, Andriko JW, Miettinen M, Aguilera NS. Histiocytic sarcoma: a study of five cases including the histiocyte marker CD163. Mod Pathol 2005; 18: 693-704.
7. Copie-Bergman C, Wotherspoon AC, Norton AJ, Diss TC, Isaacson PG. True histiocytic lymphoma: a morphologic, immunohistochemical, and molecular genetic study of 13 cases. Am J Surg Pathol 1998; 22: 1386-92.