Leptomeningeal and orbital benign lymphophagocytic histiocytosis

Case report

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An extremely rare case of isolated histioproliferative lesions arising from the subarachnoid space of the left occipital convexity and the orbit is presented. The presence of histiocytes showing lymphophagocytosis and positivity for S-100 protein staining confirmed that the lesions represented extranodal forms of sinus histiocytosis with massive lymphadenopathy.

Key Words □ lymphophagocytosis □ sinus histiocytosis □ S-100 protein □ leptomeninges □ orbit

More than 200 cases of sinus histiocytosis with massive lymphadenopathy (SHML) have been reported since Rosai and Dorfman first described it in 1969. Typically, SHML is characterized by massive bilateral cervical lymphadenopathy with fever, leukocytosis, hypergammaglobulinemia, and an increased erythrocyte sedimentation rate (ESR). This disease can also involve other lymph nodes or extranodal organs. Although several cases of the isolated extranodal form of this disease have been reported, isolated central nervous system (CNS) involvement is extremely rare.

A case of isolated subarachnoidal and orbital histiocytosis without any other lymph node involvement is presented. S-100 protein staining was very useful in confirming the diagnosis of SHML in the orbital lesion which showed atypical histological findings.

Case Report

This 39-year-old man came to the hospital with marked proptosis of the left eye. One year before admission, he had first noted slight proptosis which gradually increased in severity. There were no other symptoms.

Examination. Examination revealed marked left-sided proptosis and slight lateral gaze disturbance. Other neurological findings were normal. The patient was afebrile. There was neither lymphadenopathy nor hepatosplenomegaly. The rest of the physical examination was normal. All blood examinations were normal except for a slightly elevated ESR of 31 mm/1 hr and 53 mm/2 hrs. Computerized tomography (CT) demonstrated a large retrobulbar mass (Fig. 1 left) and a small irregular-shaped mass in the left occipital convexity (Fig. 1 right), which were both homogeneously enhanced with contrast medium. Left carotid and vertebral angiography showed avascular masses in the left orbit and the ipsilateral occipital convexity.

Operation. Partial removal of the orbital lesion was performed via a lateral orbital approach. The mass was whitish gray, elastic, and firm, and adhered tightly to the surrounding tissues. An occipital craniotomy revealed a small, whitish-gray, hard, elastic subarachnoid mass which extended into the cerebral sulcus. The dura mater was intact. Since the mass adhered to the adjacent cerebral cortex too tightly to be dissected, it was sharply resected en bloc with a small amount of surrounding brain tissue.

Pathological Examination. Microscopic examination of the surgical specimen from the left orbital lesion showed dense fibrous tissue with infiltration by a mixed cellular population composed of lymphocytes, plasma...
Benign lymphphagocytic histiocytosis

FIG. 1. Computerized tomography scans with contrast enhancement. Left: A large retrobulbar mass is revealed in the left orbit. Right: A small irregular-shaped mass (arrowheads) with surrounding perifocal edema is seen in the left occipital region.

cells, and histiocytes which showed no lymphophagocytosis. There were no follicle-like groups of lymphocytes such as are usually seen in orbital pseudotumor. Immunohistochemical staining revealed histiocytes positive for S-100 protein. Microscopic examination of the surgical specimen from the subarachnoid lesion showed infiltration of the subarachnoid space by a mixed cellular population composed of lymphocytes, plasma cells, and histiocytes. The infiltrating cells were set in a fibrocollagenous stroma. There was moderate lymphocyte invasion of the adjacent cerebral cortex and prominent infiltration in the intracerebral blood vessels. The histiocytes were mature and had abundant vacuolated, cosinophilic cytoplasm with one or two indented nuclei. A distinctive feature was the presence of lymphocytes within the cytoplasm of several histio-
cytes (Fig. 2 left). Immunohistochemical staining revealed that the histiocytes were positive for S-100 protein (Fig. 2 right).

Postoperative Course. Although the patient's proptosis improved slightly, limitation of extraocular movement of the left eye remained postoperatively. Other neurological findings were normal. Serum electrophoresis revealed a slight elevation of immunoglobulin G. A bone scintigram and whole-body CT examination showed no other abnormalities. Three years after surgery, the patient was in good health except for proptosis and limitation of left eye movement, both of which were stable on follow-up examinations.

Discussion

Sinus histiocytosis with massive lymphadenopathy usually affects children and young adults. Approximately 80% of patients are aged 20 years or younger. The male:female ratio is 2:1. This disorder involves cervical lymph nodes in 81% and other lymph node groups in 57% of patients. Extraneural sites are involved in approximately 25% of cases. The most common sites of extraneural involvement are the upper respiratory tract, the eyelid and orbit, and the skin. To our knowledge, 10 cases (including the present one) involving the CNS (including the dura mater and epidural space) have been reported. One case of isolated dural involvement of this disease has been reported, in which the lesion infiltrated the basal dura of the middle and posterior cranial fossa, and eroded the underlying petrous bone and the floor of middle cranial fossa causing trigeminal and facial nerve disturbances. The present case is the first report of isolated subarachnoid involvement without any other lymphadenopathy.

Typical histopathological findings of SHML are: marked dilated nodal sinuses filled with mature histio-

FIG. 2. Photomicrographs of the surgical specimen from the left occipital lesion. Left: Section showing proliferated mature histiocytes with marked lymphophagocytosis (arrows). H & E, × 75. Right: Section showing S-100 protein-positive histiocytes (arrows). Peroxidase anti-peroxidase hematoxylin, × 300.
cytes showing phagocytosis of blood cells (especially lymphocytes) and proliferation of plasma cells. Histioctyosis X, which is also a histioproliferative disorder of unknown origin, can be differentiated from SHML in that the former never demonstrates histiocytes with phagocytosis. In the present case, the histological diagnosis of SHML was confirmed in the subarachnoid lesion because of the presence of histiocytes demonstrating lymphophagocytosis.

S-100 protein, which is positive in abnormal histiocytes and negative in normal histiocytes and macrophages engaged in phagocytosis, has become a new marker of abnormal histiocytes. In this case, although histiocytes showing lymphophagocytosis could not be found in the orbital lesion, the significant number of histiocytes positive for S-100 protein strongly suggested that the orbital lesion was not a pseudotumor but SHML. Buchino, et al., pointed out that there are varying stages of development identified in histopathological studies of SHML. They reported a patient with SHML who had multiple lesions, including typical bilateral cervical lymphadenopathy. Microscopic examination of specimens from the epicardial lesion showed no lymphophagocytosis in the histiocytes. Based on these findings, an immunohistochemical study or electron microscopic examination is recommended in patients suspected of having atypical SHML, especially unusual extranodal manifestations.

The etiology of SHML remains unknown. Surgery, radiotherapy, and chemotherapy have been used to treat SHML, and a case in which steroid therapy was effective has also been reported. However, no definite treatment for SHML has been established. This is not a neoplastic disease but a self-limiting process, and most cases resolve over a period of several months to several years, although several fatal cases have been reported. The purpose of treatment is to reduce local aggressiveness; if the case is operable, surgery seems the most effective among available treatments for this purpose.

References

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