Multiple Intracranial Xanthogranulomas
—Case Report—

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Abstract

A 58-year-old female was admitted to our hospital with nausea, vomiting, and gait disturbance of 1 year duration. Postcontrast computed tomographic scans demonstrated enhanced lesions in the left cerebellopontine angle (CPA), the retrosellar region, the right parasellar region, and the left parieto-occipital convexity. The left parieto-occipital tumor was totally removed in the first operation and the left CPA tumor was partially removed in the second. The histological diagnosis of both tumors was xanthogranuloma. She also had cutaneous lesions (subcutaneous nodules without tenderness) and an ureteral stenosis possibly due to the retroperitoneal involvement. A skin biopsy demonstrated infiltration of xanthoma cells and foamy cells in the dermis. A gallium scintigram demonstrated an abnormal uptake in the thoracic cavity, liver, and bones. From these findings, systemic Weber-Christian disease was diagnosed. Another unique aspect was that the serum IgE levels were increased during postoperative hospitalization. This suggests that abnormal immunological conditions are related to this disease and that intracranial xanthogranulomas are a manifestation of systemic Weber-Christian disease.

Key words: xanthogranuloma, Weber-Christian disease

Introduction

Intracranial xanthogranulomas (or xanthomas) of extrachoroidal origin are extremely rare and only eight cases have so far been reported. Here, we present a case of multiple intracranial xanthogranulomas of the dura mater associated with systemic Weber-Christian disease, and a review of the literature.

Case Report

A 58-year-old female with a 5-year history of annoying pain in the left forehead was admitted to our hospital on May 8, 1984, because of nausea, vomiting, and gait disturbance. She had also noticed a hearing difficulty in the left ear for 6 months. Neurological examination on admission revealed a decreased corneal reflex on the left and unsteady tandem gait. An audiogram disclosed a 70 dB sensorineural hearing loss at 8000 Hz on the left. Physical examination found a subcutaneous nodule without tenderness in the left buttock. Laboratory tests showed an increased erythrocyte sedimentation rate and positive C-reactive protein as the only abnormal findings.

Precontrast computed tomographic (CT) scans showed slightly high-density lesions in the left cerebellopontine angle (CPA), the retrosellar region, and the right parasellar region (Fig. 1 upper). Postcontrast CT scans demonstrated homogeneous enhancement of these lesions (Fig. 1 lower).
Moreover, another enhanced lesion was disclosed in the left parieto-occipital convexity. A left common carotid artery angiogram revealed a tumor stain in the posterior fossa, supplied by branches of the left occipital artery, and poor filling of the left transverse sinus (Fig. 2). A right common carotid artery angiogram showed elevation of the A1 portion. Left vertebral artery angiograms revealed the upward displacement of the left anterior inferior cerebellar artery, poor filling of the left posterior inferior cerebellar artery, and dorsal displacement of the basilar artery.

A yellowish, hard, and hemorrhagic tumor in the convexity was totally removed through a left parieto-occipital craniotomy on May 18, 1984. It adhered to the dura but was clearly demarcated from the surrounding tissue. On May 30, 1984, the left CPA tumor was partially removed via a left lateral suboccipital craniectomy. The left transverse sinus occluded completely due to the tumor infiltration. The relationship of the tumor with the 7th and 8th cranial nerves was not clarified.

Histological examination disclosed the same find-
ings in the first and the second surgical specimens, i.e., infiltration of foamy macrophages and/or histiocytes without malignant manifestations observed among well developed connective tissue (Fig. 3). The perivascular infiltration of small round cells and development of the reticulin fibers were also revealed. There was no characteristic cellular configuration.

Postoperatively, she received chemotherapy (vincristine, cyclophosphamide, prednisolone, adriamycin) and radiation therapy (total dose: 50 Gy). On March 4, 1985, CT scans demonstrated the enlargement of the retrosellar and the parasellar tumors, although the left CPA tumor had central necrosis (Fig. 4). She developed systemic drug eruption. Laboratory tests revealed normocytic hypochromic anemia and a positive Coombs' test. Ureteral stenosis and hydronephrosis were demonstrated by a retrograde pyelogram which might be due to retroperitoneal involvement. She underwent a nephrostomy followed by episodes of relapsing fever with skin eruption. A skin biopsy of the tender nuchal region and the back demonstrated the infiltration of xanthoma cells and foamy cells in the dermis. A gallium scintigram showed an abnormal uptake in the thoracic cavity, liver, and bones. Laboratory examination revealed that the serum IgE levels had increased during the postoperative hospitalization (Fig. 5). There was no evidence of plasma cell myeloma in the bone marrow puncture biopsy performed on August 23, 1985. She underwent short-term administration of betamethazone and indomethacin, but the tumor size was unchanged for the 2-year follow-up period.

**Discussion**

Intracranial xanthogranulomas are rare and classified into two types, i.e., the intraventricular type and the dural type. The intraventricular type, first described by Blumer in 1900 under the name of cholesteatomatous endothelioma, commonly originates from the choroid plexus of the lateral ventricles. Several cases of third ventricle origin which ob-

**Fig. 3** Photomicrographs of the cerebellopontine angle tumor. A: Infiltration of numerous cells, most of which are foamy macrophages and/or histiocytes, are observed among well developed connective tissue. HE stain, × 40. B: A higher magnification of the infiltrated macrophages. Phosphotungstic acid hematoxylin stain, × 200. C: Perivascular infiltration of small round cells in some areas. HE stain, × 100. D: Well developed connective tissue can be seen in most of the specimen. Reticulin stain, × 40.
constructed the foramen of Monro and caused hydrocephalus have been reported. Terao et al. described a case of choroid plexus xanthogranuloma in a child with epilepsy, and Lubo Antunes et al. reported a mixed colloid cyst-xanthogranuloma presenting with chemical meningitis. However, intraventricular type xanthogranulomas are usually asymptomatic and only found at postmortem examination. A series of 1181 autopsies by Wolf et al. found 20 choroidal xanthomas. Frequent bilaterality, punctate calcification on x-ray films, poor accumulation in gamma-encephalograms and little vascularity on angiograms were described as diagnostic points by Terao et al. The dural type is extremely rare, and only eight cases have so far been reported. Common locations are the tentorium cerebelli, parasellar and the parietal regions. Dural type xanthogranulomas are usually multiple.

Weber-Christian disease was first described by Pfeifer in 1892. This disorder of unknown etiology presents in a variety of forms and is classified as follows; 1) a cutaneous form characterized by recurrent episodes of fever, malaise, and arthralgia associated with small, tender, subcutaneous nodules in the thighs, buttocks and abdominal wall, 2) a visceral form involving the fatty tissues of the gastrointestinal system. 

Fig. 4  Pre- (upper) and postcontrast (lower) CT scans taken after the two operations and chemoradiotherapy, showing enlargement of the retrosellar and parasellar tumors.

Fig. 5  Increased serum IgE levels found during postoperative hospitalization (normal range: 14–1000 U/ml).

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nal tract and occasionally the retroperitoneal structures, and 3) a systemic form that may involve the organs of the thoracic cavity and bone marrow. In the nine reported cases of the dural type intracranial xanthogranuloma including our case, systemic Weber-Christian disease was observed in five,3,6,13,16 Hand-Schüller-Christian disease in one,22 and familial type IIa hyperlipoproteinemia in two.1,17 Although the incidence of intracranial xanthogranulomas in patients with systemic Weber-Christian disease has not been quantified, routine intracranial studies such as CT scans are mandatory. The standard treatment of Weber-Christian disease in the past has been with corticosteroids and azathio-
purine.8,14 These drugs have been reported to improve or to halt progressive symptoms in 87% of patients with the cutaneous form.15 However, all patients with the systemic form died.3,6,13,16 Our case received betamethazone and indomethacin administration following chemoradiotherapy but the result was unsatisfactory.

The pathogenesis of intraventricular xantho-
granulomas has been discussed by several authors. Active lipid storage by the choroidal epithelium9,19,20 and hemorrhage into the choroid plexus4,19,20 have been suggested as causative factors. In dural xanthogranulomas, lipotropic factors from the blood under autoimmune conditions may cause undifferentiated mesenchymal cells in the dura to undergo xanthomatous transformations.2,11,16 In the present case, drug-induced hemolytic anemia and a positive Coombs' test were observed postoperatively. Common immunological findings in hemolytic anemia are increased serum IgG levels and activation of complement, without associated increases in serum IgE levels. In the present case, however, IgE was increased, which suggests there is a relationship with the pathogenesis of this condition.

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