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CASE REPORT

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An asymptomatic hypertrophic pacchionian granulation simulating osteolytic lesion of the calvaria

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Abstract. Osteolytic lesions can be seen in various diseases. We present a rare case of symptomatic hypertrophic pacchionian granulation mimicking bone tumor in the calvaria. A 50-year-old woman suffered from a previous VII cranial nerve peripheral paresis accompanied by headache. A plain radiograph revealed a punched-out paramedial occipital lesion. Precontrast-enhanced computed tomographic scans demonstrated a hypodense mass, with a defect of both tables of the left occipital bone. Magnetic resonance imaging (MRI) demonstrated a hypointense mass on the T1-weighted image and isointense to cerebrospinal fluid on the T2-weighted image, with capsule-like contrast enhancement by gadolinium. A biopsy was performed. Histologically, hypertrophic pacchionian granulation was diagnosed. The patient has had no growth for 2 years. This case suggests the need to include hypertrophic pacchionian granulation in the differential diagnosis of punched-out lesions.

Key words Osteolytic skull lesions · Arachnoid granulations

Introduction

Pacchionian granulation, known to connect the cerebrospinal fluid with the venous system, is present in the vicinity of the venous system [10]. We report a case of an asymptomatic hypertrophic pacchionian granulation mimicking bone tumor in the calvaria and discuss the differential diagnosis.

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Case report

A 50-year-old woman with a previous history of VII cranial nerve peripheral paresis accompanied by headache was admitted to our hospital. Precontrast-enhanced computed tomographic (CT) scans demonstrated a hypodense occipital mass (Fig. 1), with a defect of both tables of the calvaria. The lesion was not enhanced by contrast medium. Magnetic resonance imaging (MRI) demonstrated a hypointense occipital mass on the T1-weighted images and isointense to cerebrospinal fluid on T2-weighted images, showing capsule-like enhancement with gadolinium con-

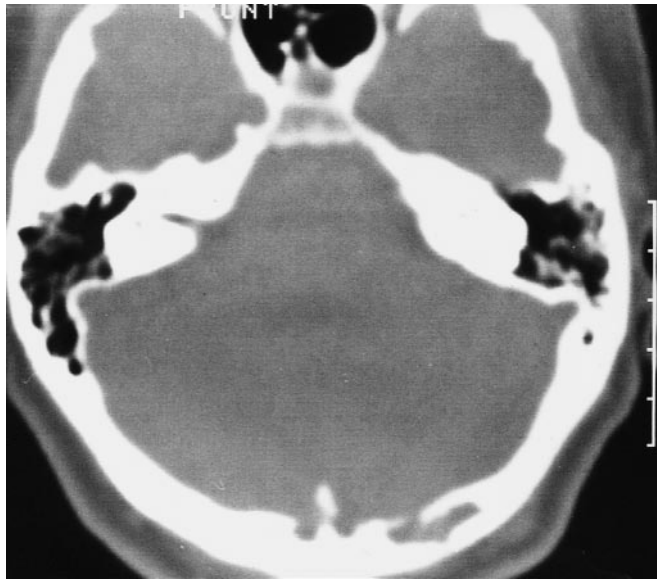


Fig. 1 CT scans demonstrated a hypodense osteolytic lesion, about 1 cm lateral from the midline

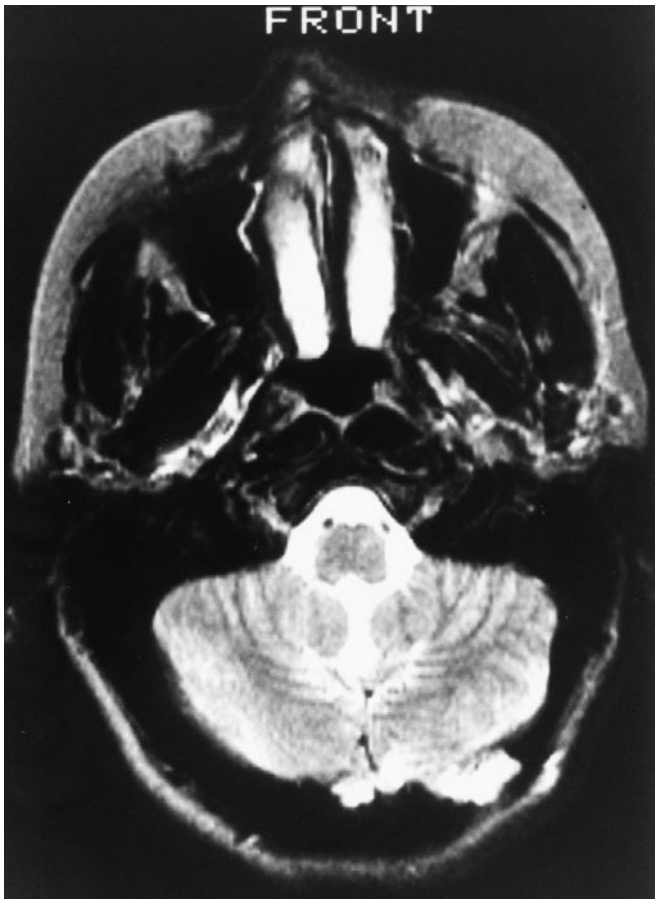


Fig. 2 MRI showed an intraosseous lesion isointense to cerebrospinal fluid on T2-weighted images of the left occipital bone

trast material [gadolinium diethylenetriaminopentoacetic acid (Gd-DTPA)] (Fig. 2). The lesion was separate to the transverse sinus. MRI angiography did not show defects or signal foci of sinuses.

A biopsy was performed and intraoperative findings revealed a mass, located about 1 cm lateral from the midline. It had destroyed the outer and inner tables of the cranium and considerable bleeding was encountered during the operation. The bone defect was reconstructed with methyl methacrylate. Histologically, the tumor mass was attached to the outermost layer of the arachnoid membrane and extended outwardly to the brain. The central portion was a core rich in collagen fibers visualized by Masson's trichrome staining, with sparsely scattered, presumably core arachnoid cells (Fig. 3). These meningothelial cells and core arachnoid cells were positive for vimentin, epithelial membrane antigen and S-100 protein, as revealed by immunohistochemical examination. The histology diagnosis was pacchionian granulation.

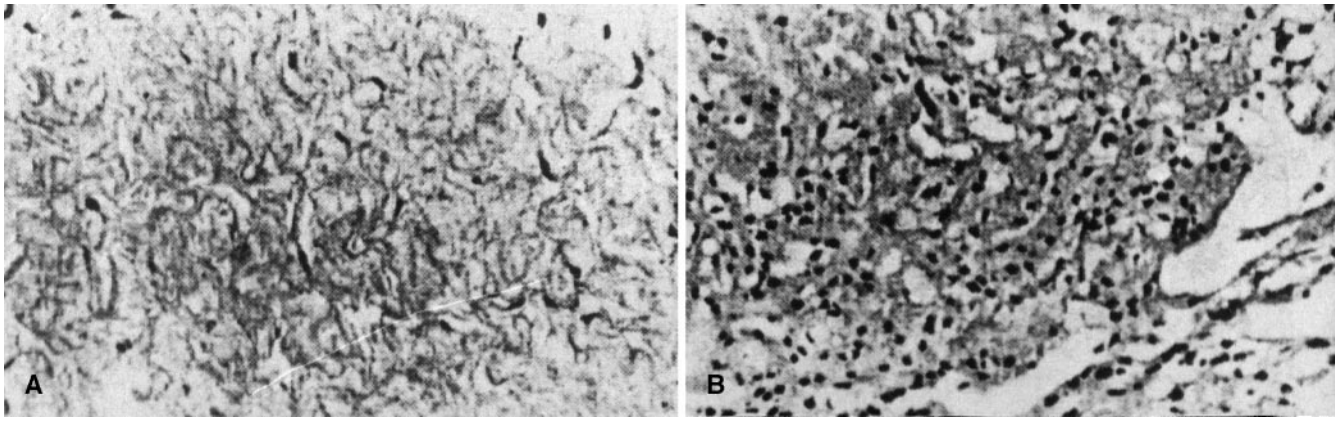
The patient was discharged from the hospital with no neurological findings 10 days after surgery and has had no growth for 2 years (MRI).

Discussion

Autopsy studies have revealed pacchionian granulation protrusion into the venous sinus [4, 6, 8, 9]. Pacchionian granulations sometimes expand into the diploic space and rarely erode the outer table [1]. Clinically, there are otorhinological reports of dural defect caused by hypertrophic pacchionian granulation in the middle cranial fossa [5]. In neurosurgery, cases have been reported in which differentiation from bone tumor was difficult [1–6]. However, almost all of these reports concern pacchionian granulation affecting the midline (posterior frontal bone and anterior parietal bone within 2 cm of the midline) or cranial base. Only two reports have presented hypertrophic pacchionian granulation in the cranial vault located far from the midline with no association with the venous sinus [2, 5]. In our case, this finding was seen on MRI angiography.

Radiographically, bone erosion was represented by a small, rounded defect in the bone, with no sclerosis. Two cases have been reported of CT findings of symptomatic hypertrophic pacchionian granulation, and the findings were very similar to ours. Despite the potential for psammomatous calcification in pacchionian granulations [1, 7, 10], no calcifications were seen on plain X-ray skull films and CT scan in our case. There is one previous re-

Fig. 3 Microscopic findings. Core arachnoid cells and collagen fibers **(A)** and meningothelial cells in the peripheral portion of the mass **(B)**. H&E ×200



port of MRI findings; our case showed a hypointense mass on the T1-weighted images and was isointense to cerebrospinal fluid on the T2-weighted images, with capsule-like enhancement with gadolinium (Gd-DTPA). MRI angiography showed no defects or signal foci of the sinuses.

Ordinarily, the erosions caused by pacchionian granulation are differentiated from other lytic lesions by virtue of their parasagittal location. At a distance from the midline, as in our case, they cannot be identified with certainty. With epidermoid/dermoid cysts and desmoplastic fibroma, usually a sclerotic margin associated with the osteolytic lesion is seen on the skull X-ray. Epidermoid/dermoid cysts, besides having a less regular wall, are heterogeneous on T1-weighted images and may show calcifications. Eosinophilic granuloma and osseous schwannoma do not show a sclerotic margin; osteoid osteoma has aspecific radiological features and varies according to the stage of the tumor at the time of presentation; calcifications are present in variable quantities. Hemangiomas appear as a lytic lesion containing, in direct view, a honeycomb pattern and, in tangential view, a sunburst pattern, radiating from a common center.

Metastases, enlarged venous lacunae and osseous meningiomas cannot always be distinguished and the lesion should be studied for pathologic diagnosis. Plasmacytomas showed an osteolytic area localized on skull plain X-ray and a hyperdense mass on CT scan.

Pacchionian granulation is not neoplastic, although it reportedly increases in size [4]. In the present case, hypertrophic pacchionian granulation was discovered incidentally and treated surgically as a suspected bone tumor. In conclusion, it is necessary to consider hypertrophic pacchionian granulation in the differential diagnosis of osteolytic lesions.

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