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Nontraumatic Convexity Intradiploic Arachnoid Cyst

—Case Report—

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Abstract

A 63-year-old male presented with an unusual case of nontraumatic intradiploic arachnoid cyst in the frontotemporal convexity area. Skull radiography showed a circular osteolytic lesion of the right parietal bone. Computed tomography revealed a defect of the inner table, widened diploic space, and thinned outer table. Magnetic resonance imaging showed a cyst containing cerebrospinal fluid. Bone scintigraphy showed no abnormal uptakes. Intraoperative observation confirmed the neuroimaging findings. Histological examination found no abnormal findings in specimens of skull bone or arachnoid membrane. Intradiploic arachnoid cyst is characterized by parasagittal, multiple, well-demarcated osteolytic lesions on radiographs in the elderly. However, the clinical features of this disease remain unclear and diagnosis without an exploratory surgical procedure may not be possible.

Key words: intradiploic arachnoid cyst, osteolytic lesion, convexity, diagnosis

Introduction

The correct diagnosis and appropriate treatment of a circumscribed lytic lesion of the skull are sometimes difficult to achieve. The differential diagnosis includes "intradiploic arachnoid cyst," which describes a nontraumatic cranial arachnoid cyst developing from diverticuli of the arachnoid membrane through small defects of the skull.[6] This disease is characterized by multiple, parasagittal (commonly in the occipital region), well-demarcated osteolytic lesions.[1,3-6] However, the natural history remains unclear due to the rarity of this disease. We report an unusual case of nontraumatic single intradiploic arachnoid cyst located in the non-parasagittal region, in which the diagnosis was based on intraoperative findings and histological examinations.

Case Report

A 63-year-old male visited our department complaining of heaviness of the head. There was no history of antecedent trauma or infection. His general physical examination was normal, and there was no scalp abnormality or bruit.

Skull radiography demonstrated a circular osteolytic lesion of the right parietal bone at the frontotemporal side (Fig. 1 *left*). Computed tomography of the skull revealed a defect of the inner table, widened diploic space, and thinned outer table (Fig. 1 *right*). Magnetic resonance imaging showed a cystic lesion

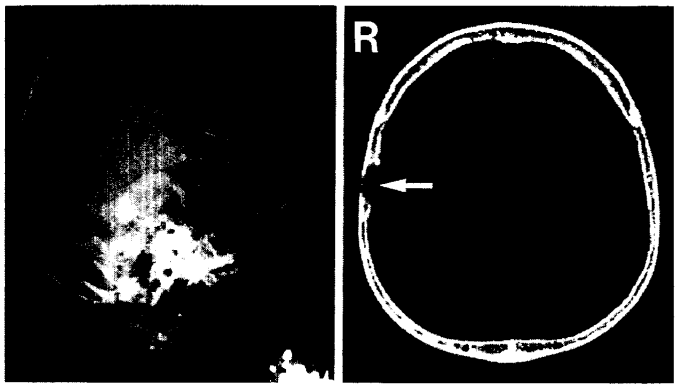

Fig. 1 ***left*: Skull radiograph, lateral view, showing a single osteolytic lesion (*arrow*) in the frontotemporal area. *right*: Computed tomography scan with a bone window showing a bone defect (*arrow*) of the inner table and intradiploic space at the osteolytic lesions.**

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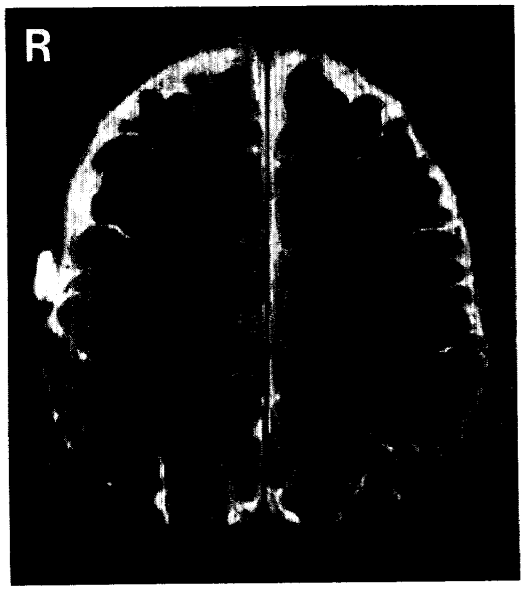

Fig. 2 T_2-weighted magnetic resonance image showing the arachnoid cyst protruding into the intradiploic space.

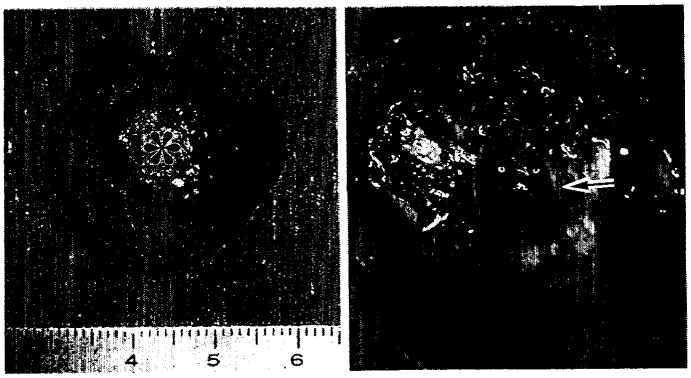

Fig. 3 Intraoperative photographs showing a defect of the inner table (*asterisk*) and intradiploic space of the bone specimen (*left*) and an arachnoid cyst protruding through the dural defect (*arrow*) (*right*).

isointense with the cerebrospinal fluid (CSF) located at the same position as the bone defect (Fig. 2). Technetium-99m bone scintigraphy showed no abnormal uptake in this lesion or any other site of the body. No diagnosis could be made based on these examinations, so exploratory surgery was performed.

Exposure of the skull found that the periosteum was intact over the surface of the lesion, and a bone piece including the lesion was easily removed. The center of the outer table of the skull was thin and transparent, but the structure was normal. There was a defect in the inner table and diploic space, and no dural components were observed (Fig. 3 *left*). In this region, a cyst formed by the arachnoid membrane protruded like a dome through a round dural defect of size 6 × 4 mm (Fig. 3 *right*). A specimen of the arachnoid membrane was removed for histological examination. The cyst contained only CSF, and no protrusion or abnormality of the brain tissue was observed. The defects of the dura mater and the skull were repaired with artificial dura mater (GORE-TEX patch; Japan Gore-Tex Co., Tokyo) and a resin plate, respectively.

The postoperative course was uneventful. No abnormal histological finding was observed in the specimens of skull and arachnoid membrane.

Discussion

Intradiploic arachnoid cyst is a rare osteolytic lesion of the skull, and the clinicopathological features are still obscure. The first patient with intradiploic arachnoid cyst had a history of mild head trauma, but radiography of the skull revealed no fracture.[4] Two patients without history of head trauma had asymptomatic osteolytic skull lesions associated with "intradiploic CSF fistula." These patients may have suffered a minor blunt head injury resulting in a small linear fracture of the inner table of the skull with injury to the dura and delayed development of an arachnoid pouch to the diploic space.[1] Two elderly males presented with multiple posterior parietal and occipital osteolytic lesions, neither associated with a history of head trauma. Intraoperative observations and histological examination suggested that these lesions were congenital in origin, and were named "intradiploic arachnoid cyst."[6]

Intradiploic arachnoid cyst is characterized by multiple, symmetrical, and well-demarcated occipital osteolytic lesions on plain skull radiography in the elderly based on five similar cases (including one nonsurgical case).[3] However, an unusual case was associated with hemorrhage into the cyst in the frontotemporal area, and five previous cases were really modified pacchionian corpuscles rather than true intradiploic arachnoid cyst, based on areas in which arachnoid granulations or pacchionian were common.[2] In our patient, the single lesion was developed in the convexity of parietal bone, but the diagnosis was "intradiploic arachnoid cyst" based on the findings of surgery and histological examinations. Ours and the former case[2] are the only reports of convexity intradiploic arachnoid cyst.

At present, intradiploic arachnoid cyst is difficult to characterize and a diagnosis without an exploratory surgical procedure may not be possible. The differental diagnosis of an unusual osteolytic lesion of the skull in the elderly should include intradiploic arachnoid cyst, even if the lesion is a single and lo-

cated in the convexity area.

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