membrane with cartilaginous loose bodies formation simultaneously. Finally, in the third phase, only cartilaginous loose bodies are found. The classification of the developmental phases is important and helpful for making a treatment plan. We judged that this case represented the third stage on the basis of the arthroscopic examination and subsequent histologic diagnoses.

Various treatments have been used for SC of the TMJ. Open arthrotomy for removing loose bodies is most commonly advocated. In the study of Shah et al,[9] a large variability in the number of loose bodies removed from the joint spaces was described, from a single body to more than 200 small nodules. Arthroscopy was used in 29 of 242 cases. They thought that data from the present systematic review do not support the hypothesis that minor surgery may be enough to treat SC. The reported success rate of arthroscopy is no better than 55% because almost half of cases with loose bodies completely removed from the joint cavity were not achieved through arthroscopy or arthrocentesis only, and open surgery was needed to clear the synovia thoroughly. Cai et al[7] considered therapeutic arthroscopy appropriate for patients with separate mass lesions and without extra-articular extension. They commonly chose treatment modalities according to results of MRI and empirically listed the indications for arthroscopic surgery. According to McCain and de la Rua,[13] open arthrotomy is necessary if loose bodies are larger than 3 mm. However, in our case, we can remove all the loose bodies even larger than 6.5 mm in the upper space through arthroscopic surgery. Small loose bodies were removed through joint lavage or using the biopsy forceps, and bigger loose bodies were taken out using the biopsy forceps and cannula together (Fig. 6). All symptoms of the patient disappeared after the arthroscopic surgery, and no recurrence was observed after 10 months of follow-up.

We concluded that when SCs are confined to the upper joint space, with loose bodies alone and without extra-articular extension, arthroscopy should be the first choice for diagnosis and treatment of patients with SC of the TMJ. Most patients with SC can be treated through surgical arthroscopy.

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Giant Intradiploic Epidermoid Cyst Presenting as Solitary Skull Mass With Intracranial Extension

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Abstract: Epidermoid cysts are rare benign tumors that constitute 0.3% to 1.8% of all intracranial tumors. They are inclusion tumors that include epidermoid elements and are most commonly located in the cerebellopontine angle cistern and the parasellar region, and their location in the diploic space is very rare. These lesions slowly grow and usually do not involve the intracranial compartment. In this article, a case of giant epidermoid cyst located in the left frontal intradiploic space is presented with clinical, radiologic features and surgical treatment.

Key Words: Epidermoid cyst, intradiploic, calvaria, scalp

Epidermoid cysts are rare congenital lesions originating from the ectoderm that constitute 0.3% to 1.8% of all intracranial tumors.[1–3] Most are congenital and originate from the remaining ectodermal tissues when the neural tube is closed at the 3 to 5 gestational weeks. Intradiploic epidermoid cysts are very rare benign tumors located between the 2 tabulae of the cranial bones and grow slowly and rarely require surgical treatment. Malignant transformation is rare. Symptomatic large masses are treated surgically.[2–5]

PATIENT

A 69-year-old man presented to our clinic with a complaint of a mass that had pushed onto the scalp and formed a bulge, which had been prominent in the left frontal region for 6 months. He had

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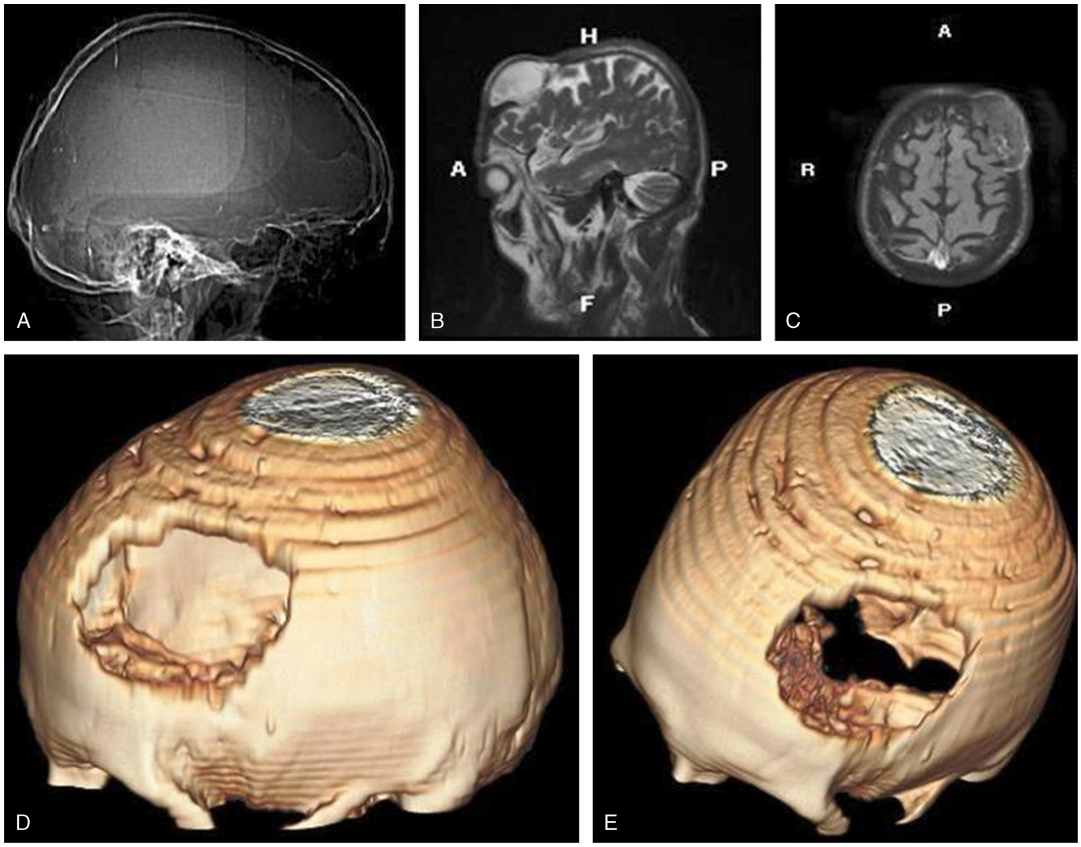

FIGURE 1. A, The expansile, regular lesion located in the left frontal region, eroding the inner and outer tabulae, is seen on the skull x-ray film. B, The lesion is seen to have a hyperintense-signal characteristic on T2-weighted sagittal MRI. C, The lesion is seen to have mixed–intense signal characteristic on T1-weighted axial MRI. D and E, The mass lesion is seen to completely erode the bone inward and outward on three-dimensional tomographs.

episodes of headache in recent months. He also had local tenderness and a cosmetic problem. There was no history of trauma. His neurologic examination and routine biochemical test results were normal. The results of bone scintigraphy revealed a focal hypoactive area with low activity in the walls in the left frontal region. A mass lesion that had led to a wide destruction in the bone in the left frontal region, extending to the adjacent dura, which was accompanied by a soft tissue component and caused pressure on the brain parenchyma at this level, measuring 6 × 3 cm under the scalp with peripheral contrast uptake with hyperintense signal properties in T2-weighted sequences and mildly hyperintense properties in T1-weighted sequences was observed on three-dimensional computed tomography and magnetic resonance imaging (Fig. 1).

SURGERY

The skin flap was removed through a left frontal skin incision surrounding the mass. The bulging mass was seen to have destroyed the skull bone, still with the surrounding healthy bone tissue. The bone tissue was removed by circling the mass. The mass was removed from the dura to which it was firmly adhered. The mass lesion was seen not to have invaded the underlying dura and the parenchyma. The mass was totally removed. On the macroscopic examination, a whitish mass measuring 8 × 5 cm, with approximately 1 cm of wall thickness, and totally eroding the bone was observed. On the histopathologic examination, a cystic formation, which included a granular layer, lined with squamous epithelium, containing keratinous material in the lumen, was observed (Fig. 2). The patient was discharged from the hospital without complications.

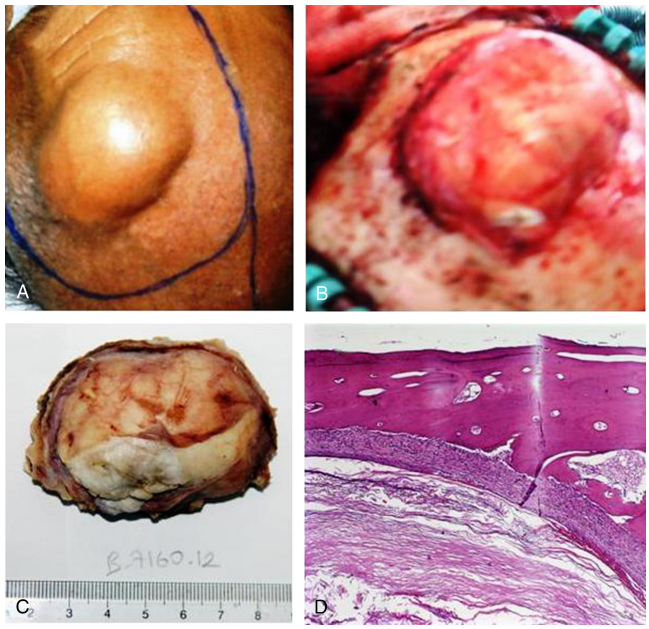

FIGURE 2. A, The mass lesion is seen to have caused a prominent bulging in the scalp in the left frontal region. B, The mass, which has a thick membraneous wall, is seen to have extruded by eroding the bone. C, Macroscopic appearance of the mass lesion. D, A cystic formation lined with squamous epithelium including a granular layer and having keratinous material in its lumen was seen on the histopathologic examination.

DISCUSSION

Epidermoid cysts are rare benign tumors originating from the ectoderm. These tumors originate from ectodermal remnants within the neural tube during its closure at 3 and 5 weeks of gestation.[1–3] The most common presentation of cranial intradiploic epidermoid cysts is long-standing asymptomatic, painless soft swellings covered with normal skin. They may cause headache and local tenderness.[1,3,6] Our patient also had a mass lesion, which caused headache and bulging of the scalp by growing in recent months. It is histologically covered with a diffuse fibrous capsule, which includes keratin, cholesterol crystals, protein, debris, and cerebrospinal fluid (CSF).[3,4,6] It usually grows slowly and does not show significant clinical findings until the second to the third decade. The most common location is the cerebellopontine angle cistern. It is less frequently located in the parasellar region and the medial cranial fossa. Intradiploic epidermoid cysts may be located in the tabular bones of the calvaria, paranasal sinuses, maxilla, temporal bone, and sphenoid bone. It is frequently located in the occipital, frontal, and parietal bones.[2,5,6] Aneurysmal bone cysts, dermoid cysts, cavernous hemangioma, and Langerhans cell histiocytosis should be considered in the differential diagnosis of intradiploic epidermoid cysts. On direct x-rays, it is seen as a lytic lesion with a regular contour and sclerotic margins. Atypical lesions may be larger than 5 cm and irregular. Computed tomography is the most effective method for indicating the involvement of bone tissues and calcifications. Idiopathic epidermoid cysts are seen as lytic hypodense mass lesions destroying the inner and outer tabulae. Calcification is rare.[6–8] Rarely, they may be seen as hypodense because of intratumoral hemorrhage when complicated. The inner structure, the outer surface of the tumor, and the relationship with the brain parenchyma may be seen on magnetic resonance imaging (MRI) examination of epidermoid cysts. It is usually isointense with CSF on T1-weighted sequences and hyperintense on T2-weighted sequences and exhibits heterogeneous signal properties. It is sometimes observed to be hyperintense compared with CSF on T1-weighted sequences because of hemorrhagic or proteinous content. Epidermoid cysts are observed to be hyperintense on flair sequences because of their protein and keratin content. Epidermoid cysts do not show contrast uptake. However, peripheral contrasting may be seen secondary to perilesional inflammation on computed tomography and MRI.[6–8] Malignant transformation of epidermoid cyst epithelium is very rarely seen.[2,4,5] Bretschneider et al[9] described squamous cell carcinoma originating from primary intradiploic epidermoid cyst. Hoeffel et al[10] reported that an intradiploic epidermoid cyst seen in the parieto-occipital bone in a 43-year-old patient remained unchanged for 12 years and that malignant changes occurred in its intracerebral component thereafter. The general approach is surgical treatment in clinically symptomatic cases, and the cyst must be removed with its capsule. Surgical excision is performed to protect from intracranial mass effect, abscess formation, and potential complications such as bleeding and malignant transformation in intradiploic epidermoid cysts.[1,3,5] Malignant transformation must be suspected in case of contrast uptake on radiologic examination. Malignant transformation occurs as squamous cell carcinoma, and the outcomes are not good despite wide excision, radiotherapy, and chemotherapy.[2,4,5] Malignancy was not encountered on the postoperative microscopic examination in the presented case. Recurrence is frequent if the intradiploic epidermoid cysts are not totally excised. The capsule should be dissected from the bone, and the dura must be totally removed.[2–5] The intradiploic epidermoid cyst located in the left frontal region was totally removed in our case.

In conclusion, intradiploic epidermoid cysts are benign lesions that must be treated surgically. Prognosis is good when removed totally, and recurrence is not observed. Epidermoid cysts must also be considered in the differential diagnosis of lytic mass lesions located in the intradiploic space, and radiologic and histopathologic examinations are required to verify the diagnosis.

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Endoscopically Assisted Removal of a Lingually Displaced Third Molar Adjacent to the Inferior Alveolar Nerve

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Background: Osteotomy of impacted lower third molars still represents a major trauma because of periosteal flap preparation and buccal bone loss. We present a new occlusal flapless approach for

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