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Case Report

Aneurysmal bone cyst of the parietal bone: case report

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ABSTRACT

Aneurysmal bone cysts are locally destructive, vascular, multicystic benign tumors of bone, which are usually located on metaphysis. Cranial aneurysmal bone cysts are uncommon. We report a 18-year-old girl with a 3-month history of skull asymetry and headache which was not relieved by analgesic drugs. Computed tomography scan demonstrated an osteolytic skull lesion of the right parietal bone and the neural tissue that was compressed without midline shift. The patient had complete recovery after total excision of the lesion. We also discuss the etiology, pathogenesis, pathologic features, imaging characteristics and treatment of cranial aneurysmal bone cysts.

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Keywords: Aneurysmal bone cyst, bone tumor, parietal bone

Introduction

An aneurysmal bone cyst (ABC) is a rare, vascular, benign tumor of the bone with obscure pathogenesis. ABC represent only 1 to 2 % all primary skull tumors. Approximately, 50% of all ABC,s are found in the metaphysis of long bones and 20% involve the vertebrae. ABCs develop on the bones of the cranium, which are Only 3-6 % [1]. We present a 18 year-old girl with ABC in the right parietal region. We also review and discuss the etiology, pathogenesis, pathologic features, imaging characteristics and treatment of cranial ABCs.

Case Presentation

A 18-year-old otherwise healthy girl presented with a 3-month history of gradually increasing swelling at the right parieatal bone and headache which was not relieved by analgesic drugs. There was a history of head trauma 5 years ago. On physical examination there was a non-tender, firm swelling in the right parietal region of the head. Neurological examination was normal. A plain radiograph of the skull revealed an osteolytic lesion of the right parietal region (Figure 1). Computed tomography (CT) scan showed extra-axial, osteolytic mass in the right parietal region,

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compressing right parietal lobe (Figure 2). T1-weighted magnetic resonance imaging (MRI) with contrast showed a large, heterogeneously contrast enhancing, extra-axial mass in the right parietal region. The mass showed medial extension with compression of parietal lobe. T2-weighted MRI showed a homogenous increase in signal intensity (Figure 3). Surgical excision of the right parietal ABC was planned. A right parietal horseshoe skin flap was raised. The tumor was softer in consistency than surrounding bone. After opening burr-holes, ABC with the the intact bone around it was excised (Figure 4). Radiotherapy was not given postoperatively. The patient was symptom free in the post operative period after 7 months of surgery. Histopathological examination showed cavernous spaces filled with blood. The spaces were separated by collagenous tissue containing fibroblasts, focal collections of osteoclastic and intermediate giant cell. Normal bony trabeculae being permeated by the lesion in the periphery was suggestive of aneurysmal bone cyst.

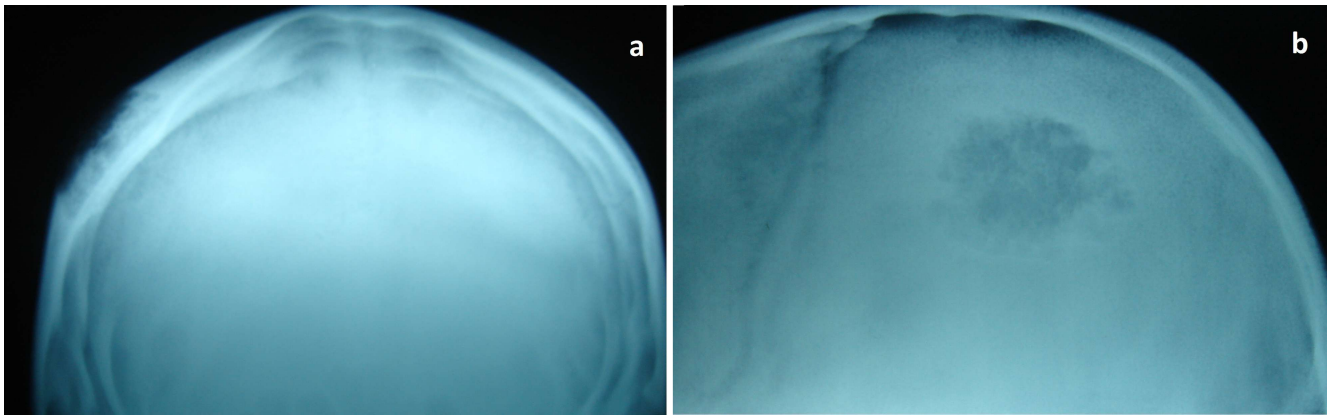

Figure 1. a) AP skull radiograph of the patient showing an osteolytic lesion in the right parietal bone. b) Lateral skull radiograph of the patient showing a nearly round radiolucent lytic lesion in the right parietal bone.

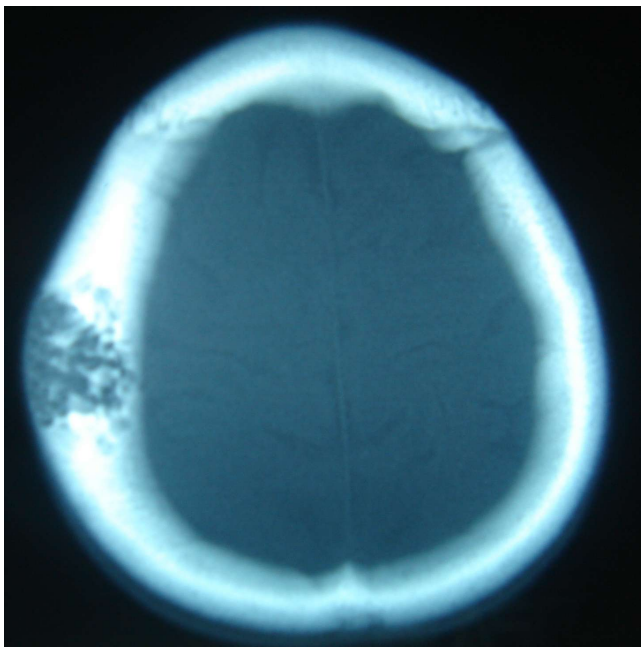

Figure 2. Axial noncontrast CT scan with bone windows reveals an osteolytic lesion with bony enlargement and cortical thinning with no periosteal reaction.

Discussion

ABCs are uncommon benign, expansile bone lesions characterized by a reactive proliferation of connective tissue containing multiple blood filled cavities and usually appear in the second decade of life [2]. The pathogenesis of ABC is still unclear. ABCs may be primary or secondary depending on the presence or absence of an associated lesion. The primary form of ABC has no identifiable preexisting lesion and is thought to be caused by traumatic or anomalous venous disruption in the osseous diploe [3]. ABCs in the presenceof another lesion are called secondary ABCs. Secodary ABCs are thougt to be formed by a disruption in the osseous circulation caused by the associated lesion, such as skeletal pathology, including fibrous dysplasia, giant cell tumor, chondroblastoma, chondromyxoid fibroma, nonossifying fibroma,

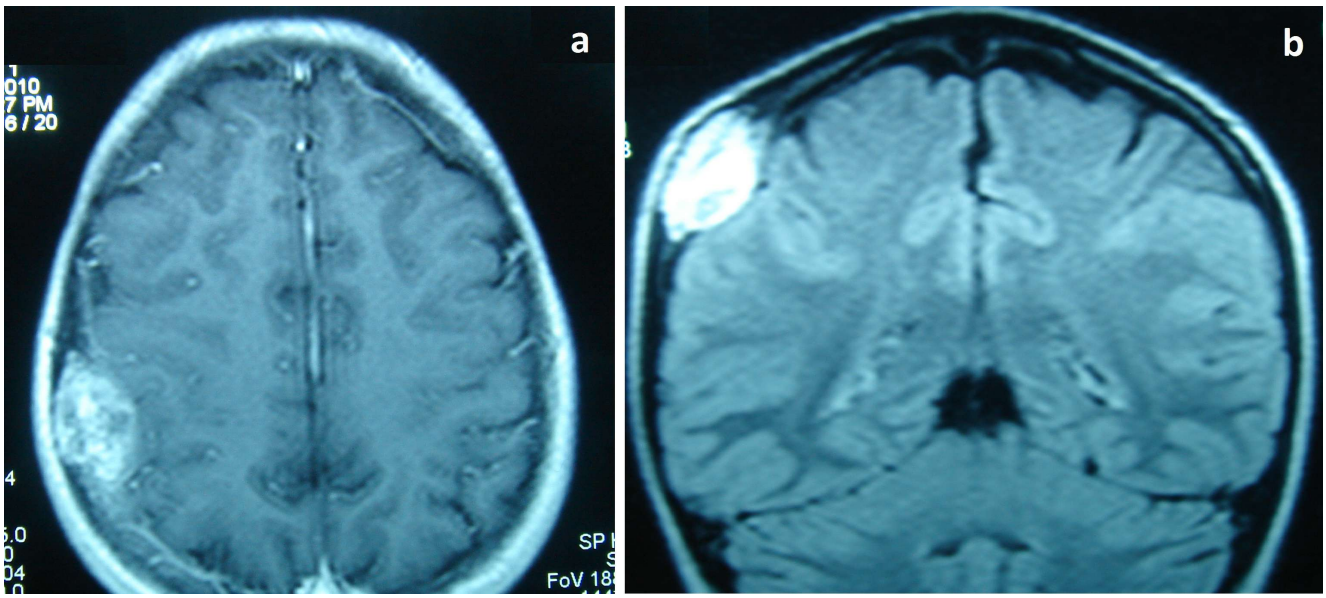

Figure 3. a) Axial T1-weighted magnetic resonance imaging with contrast showing enhancing lesion of right parietal bone.b) Coronal nonenhanced T2-weighted magnetic resonance imaging showing a hyperintense nodule eroding both the inner and outer tables of the skull

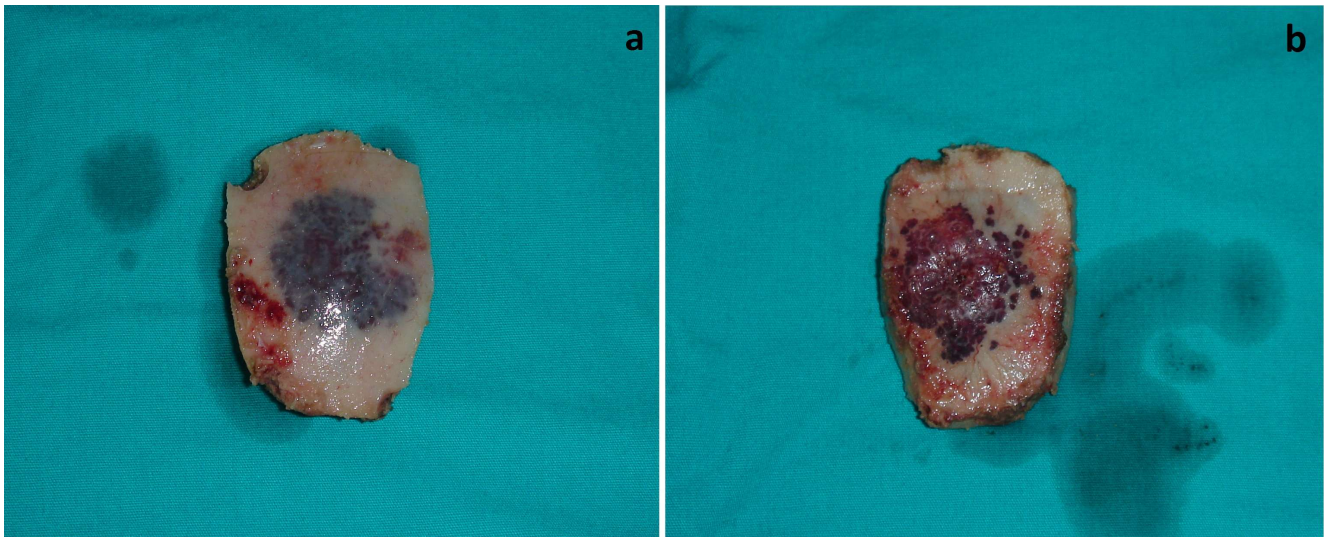

Figure 4. a) On gross examination, specimen showing outer parietal bone with microcystic spaces filled with blood. b) On gross examination, specimen showing inner parietal bone with microcystic spaces filled with blood

fibrous histiocytoma, osteoblastoma, and osteosarcoma [3]. A cranial ABC usually presents as an enlarging mass that can progress rapidly and may cause gross neurological symptoms depending on the site of the lesion in the skull. Cranial ABC can present as ptosis [4], exophthalmos [5], loss of vision [6], cranial nevre palsies [7], symptoms of raised intracranial pressure [7], seizures [1], cerebellar signs [8].

Radiological and neuroimaging appearances are often diagnostic. Plain radiographs of cranial ABC demonstrates osseous expansion with involvement of the inner and outer tables and intracranial extension. Axial CT scans of ABC reveal well-demarcated, multiloculated, osteolytic lesions. When the patient is motionless for a few minutes, fluid-fluid levels are sometimes apparent on CT scans. MRI completely delineates the margin of the ABC

as a rim of low signal intensity, and demostrates fluid-fluid levels, and easily depicts the internal septa [9].

Aneurysmal bone cysts usually exhibit symmetrical expansion, involve both the inner and outer tables of the skull, and always show intracranial extension. Individual cysts filled with unclotted liquid blood and blood-tinged serous fluid are seen in gross pathological evaluation of an ABC [10]. Microscopically, ABCs appear as blood-filled cavernous spaces lined with endothelial cells. The cysts are separated by fibrous septa containing spindle cells, multinucleated giant cells and possibly osteoid tissue.

There are different treatment options for ABCs including excision, curettage, cryotherapy(11), aspiration and drainage [12], arterial embolization [13], injection sclerotherapy [1], radionuclide ablation (14) , or radiotherapy. Radiotherapy alone has recently fallen out of favor due to the risk of postirradiation sarcoma [15].The treatment of choice is complete surgical excision. The recurrence rate of cranial ABCs is very low [16]. The recurrence rate is related to the age of the patient, size of the lesion, the presence of mitosis. The incompleteness of the resection is the most important factor causing recurrence [17], and in the cranium, there is difficulty in that it is often impossible to reach and excise the lesion completely. This is especially true if the lesion is located in the skull base, for example in the roof and/or the medial and lateral walls of the orbit, the paranasal sinuses, and the petrous temporal bone. In these partially excised or intralesionally curetted cases, adjunctive therapy such as preoperative embolization or postoperative cryotherapy or radiotherapy should be considered [18]. In some surgically difficult cases, a simple drainage procedure to relieve the pressure may suffice [12].

Conclusion

We report a rare case of parietal aneurysmal bone cyst in a young girl. We emphasize that aneurysmal bone cysts are benign tumors that cause symptoms by local compression and severe cosmetic deformities requiring resection. The treatment modality of ABC is total excision.

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