

# Aneurysmal bone cyst of the skull: A case report

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## Abstract

The authors present a case report of a 14-year-old male with a single temporal scalp nodule. After imaging and surgical resection, the diagnosis of an aneurysmal bone cyst was made. Although aneurysmal bone cysts are benign, they tend to grow rapidly and cause subsequent complications. In this case report, the authors explore the importance of physical examination in order to make more accurate diagnoses.

## Keywords

Dermatology, surgery, pathology

## Introduction

Here, we present a report of an aneurysmal bone cyst (ABC) of the parietal bone of the skull. This lesion is rare in the skull and infrequently reported in dermatology literature. When examining subcutaneous nodules, one should keep ABCs in their differential.

## Case report

A 14-year-old male was referred by his pediatrician to dermatology for a “cyst.” He presented with a new, tender, fixed nodule on his right temporal scalp. The single nodule was about 2.5 cm, and the patient stated it had been growing rapidly. The favored diagnosis was osteophyte of the skull; however, the clinical history of new onset and rapid growth were concerning.

Lymph nodes were palpated and noted to be normal in size and non-tender during the physical examination. Due to the lesions’ subcutaneous and fixed nature, a computed tomography (CT) of the head without contrast was ordered (Figure 1). The CT scan showed a lytic lesion involving the right parietal bone with full-thickness destruction of the calvarium. There was an associated periosteal reaction and an adjacent heterogeneous soft tissue mass in the right frontoparietal scalp (Figure 2). The ventricles were normal in size. There was no acute intracranial hemorrhage or evidence of infarction. The lesions’ lytic nature on CT led us to consider Langerhans cell histiocytosis and metastatic malignancy. The patient was referred to pediatric neurosurgery and was scheduled for excision of the skull lesion 3 days later. The

final diagnosis by biopsy was an ABC, in which neurosurgical intervention is most likely curative.<sup>1</sup>

## Discussion

ABCs are benign, expansile vascular lesions consisting of blood-filled channels.<sup>2</sup> They typically occur in the tibia and femur and are rarely seen in the calvaria.<sup>3</sup> ABCs are generally solitary lesions that account for 9% of benign bone tumors.<sup>4</sup> ABCs primarily occur in individuals less than 20 years old, although they may occur at any age.<sup>5</sup> When the ABC is small, it frequently goes unnoticed. However, rapid growth and expansion are associated with pain, as well as neurological deficits due to compression of adjacent tissue.<sup>6</sup> This patient did not have any neurological deficits at the time of presentation; however, the lesion did grow rapidly. The patient urgently made an appointment with his pediatrician after he noticed the “growing bump” in his scalp. ABCs are often associated with other tumors such as giant cell tumors, fibrous dysplastic tumors, chondroblastomas, chondromyxoid fibromas, and non-ossifying fibromas.<sup>7</sup> The differentials in this particular case were Langerhans Cell Histiocytosis and metastatic carcinoma, both of which carry a poor prognosis.

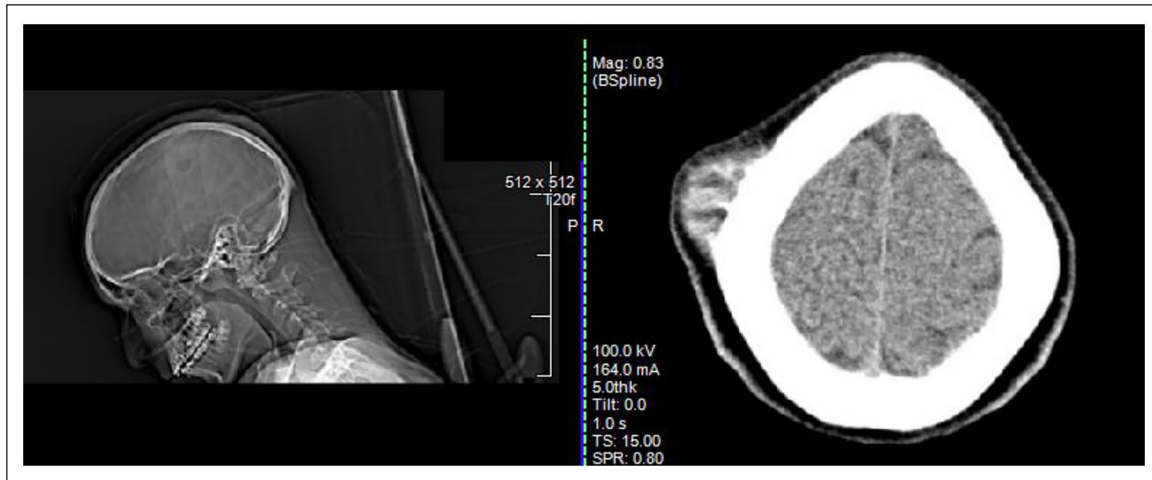
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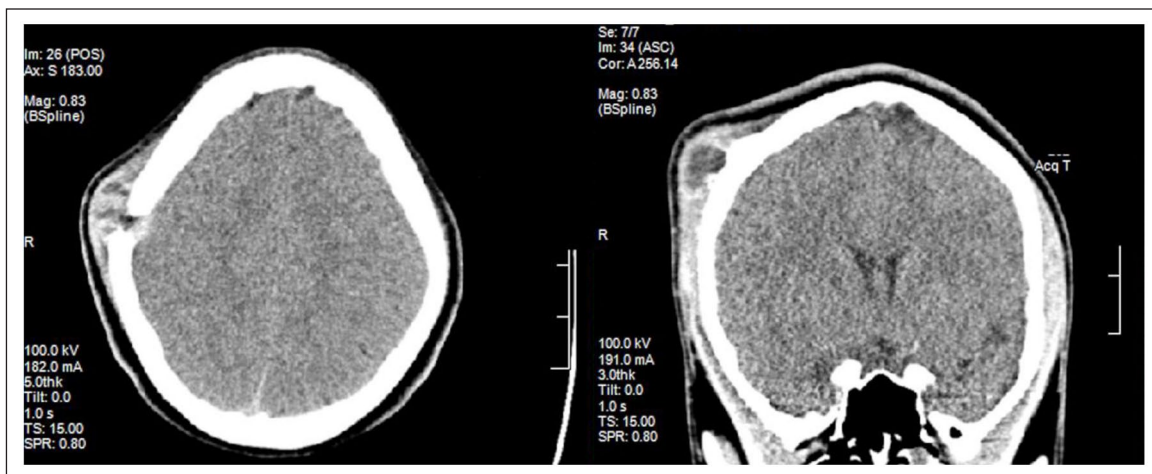
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**Figure 1.** CT head of right temporal scalp nodule.



**Figure 2.** CT head showing a lytic lesion in the right parietal bone.

During the physical examination, it is important to determine the location and size of the lesion and to assess for tenderness, swelling, deformity, and range of motion. If there is overlying erythema, warmth, or swelling, this may suggest an underlying infection. In addition, lymph nodes should be palpated and assessed for lymphadenopathy, as it then may indicate a systemic process. Imaging was needed as the nodule was subcutaneous and fixed in nature. CT and magnetic resonance imaging (MRI) are the most common imaging modalities used to diagnose skull tumors.<sup>8</sup> MRI creates images of the soft tissues of the brain, and CT scan better visualizes bone and assesses for bleeding and swelling.<sup>8</sup> Certain aspects of the patient's history that were helpful to narrow the diagnosis of a bony mass, and therefore a CT was deemed a better imaging study for this patient. On a CT scan, ABCs appear as aggressive, expansile, and lytic lesions with an "eggshell" sclerotic rim.<sup>2</sup>

ABCs are treated with excision, curettage, radiation, and bone grafting by orthopedic surgeons and in our case, neurosurgeons.<sup>9,10</sup> Recently, denosumab has been used for lesions

in the spine or pelvis to inhibit bone resorption, when the ABC cannot be treated surgically.<sup>11</sup> Although resection is typically curative, there is a 10%–50% recurrence rate.<sup>12</sup> This patient was lost to follow-up with dermatology, so recurrence is unknown. This case report highlights both the importance of performing a thorough physical examination and utilizing appropriate imaging to make an accurate diagnosis of a subcutaneous nodule.

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