



# Surgical Procedure for a Rare Case of Skull Bone Cysts: A Case Report

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## ABSTRACT

**Introduction:** Bone cysts are inclusive of but not limited to the unicameral bone cyst (UBC) and aneurysmal bone cyst (ABC). UBC have a predilection for males (3:1). UBC make up 3% of primary bone lesions. Most UBCs are found in long bones, most common sites are proximal humerus and femurs, rarely found in flat bones (Skull). Cases of UBC observed following trauma are thought to occur due to intraosseous bleeding when bone organization or repair mechanisms fail.

**Case Report:** Twenty-one-year-old male complained of headache, a history of traumatic brain injury. Motoric examinations show diminished motor function on the left side. CT Scan shows an expansile sclerotic lytic lesion on the right parietal bone. We diagnosed this case with a suggested Bone Cyst on the right parietal, and craniotomy tumor removal with a direct approach was performed. Thickened dura mater was identified, cleansed using NaCl and povidone-iodine, and drilled using a high-speed drill until flattened. The yellowish-colored bony lesion was discovered to contain a semi-translucent substance, the lesion was found to be a unicameral bone cyst.

**Discussion:** UBC is a rare condition, that's scarcely located in the skull. Post-operatively, the patient shows normal motor function and no complaint of pain. Craniectomy tumor removal and flattening of the dura mater using a high-speed drill is sufficient in treating this rare disease.

**Conclusion:** Craniectomy tumor removal, and flattening of the dura mater using high-speed drill is sufficient in treating this rare disease.

**Keyword:** Skull, Bone Cysts, Craniotomy

## 1. Introduction

Tumors of the skull make up a small but significant portion of neurosurgical practice. These lesions may be primary neoplastic, secondary neoplastic, or non-neoplastic [1] One of the benign primary skull tumor are known as bone cysts [2]. Bone cysts are often asymptomatic and found only through radiographs. However, when symptoms occur, they are usually due to pathologic fractures that cause pain, swelling, or deformity [2,3].

Bone cysts are inclusive of but not limited to the simple/unicameral bone cyst (SBC/UBC) and aneurysmal bone cyst (ABC). A simple bone cyst is a solitary fluid-filled; a benign bone cyst which may be unicameral (single chamber) or septated. It can involve any bone of extremities, the most common site being proximal humerus and proximal femur. In adults, the ilium and calcaneus are common locations. Occurrence of UBC elsewhere is uncommon, and usually occurs in adults. These lesions are most active during growth spurts and are known to heal spontaneously after bone maturity. Two-thirds of UBCs present with a fracture. UBCs in flat bones are often asymptomatic unless detected incidentally on imaging [3,4].

Cases of UBC have been observed following trauma, and are thought to occur as a result of intraosseous bleeding when bone organization and repair mechanisms fail. UBCs are most commonly found in adolescents from birth to 20 years of age. They have a predilection for males (3:1, male:female). Unicameral bone cysts make up 3% of the primary bone lesions. The actual incidence is not known as many of these are never

discovered. Treatment is not required unless the bone cyst is large and leads to deformity or symptoms, or there is an impending fracture [2].

Most of UBCs are found in the long bones, the most common sites are the proximal humerus and proximal femurs, it is rarely found in flat bones though other institutes has reported a similar case in the past. A related case report from 2018 in London found UBC in the cranial vault, another case in 2015 shows a rare location of simple bone cyst on the maxillofacial region, and 2003 case report shows bone cyst in the calvarium region. Due to this rare occurrence, we would like to present a rare case of Bone Cyst on the parietal bone [4, 5, 6].

## 2. Case Report

A twenty-one-year-old male presented to the RSUP HAM Neurosurgery department with a chief complaint of headache since the past year that had worsened in the previous three months. The Patient experienced a traumatic brain injury four years ago when he fell off a motorcycle and suffered an impact on the right side of his skull. There was no history of seizure, loss of consciousness, vomiting, loss of motor function, vision impairments, abnormal tissue growth, or rapid increase/decrease in body weight. The patient had no previous examinations before arriving at the RSUP HAM Neurosurgery department.

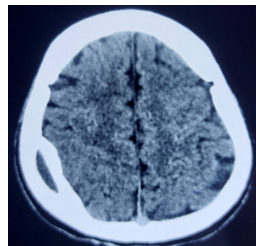


Figure 1: Pre-Op Non-Contrast Head CT-Scan shows an expansile sclerotic lytic lesion of the right parietal bone compressing the right parietal lobe with no periosteal reaction

Motoric examinations shown a diminished motor function on the left side, other physical examinations show normal findings. We conduct a Non-Contrast Head CT Scan examination that shows an expansile sclerotic lytic lesion on the tabula diploe of the right parietal bone compressing the right parietal lobe with no periosteal reaction. We diagnose this case pre operatively as skull tumor susp bone cyst on the right parietal, and craniotomy tumor removal with direct approach were performed.

Incision using a horseshoe design on the right parietal bone, subgalea was dissected for making skin flap, and burr hole was made on 4 points, the cranium is then opened. Thickening of the dura mater was identified; dura mater was cleansed using NaCL and povidone iodine. The dura mater was drilled using a high-speed drill until flatten, a yellowish coloured bony lesion was discovered containing a semi-translucent substance, and some of the tissue was preserved for histopathological examination. The hanged dura mater is returned, and fixated. The wound is closed layered by layered completing the surgery. The removed tissue was delivered to the pathology anatomy department for histopathological examination, and the lesion was found to be a simple bone cyst. Post operative follow up 2 weeks post operation, the patient shows a normal motoric function, with no complaint of pain.

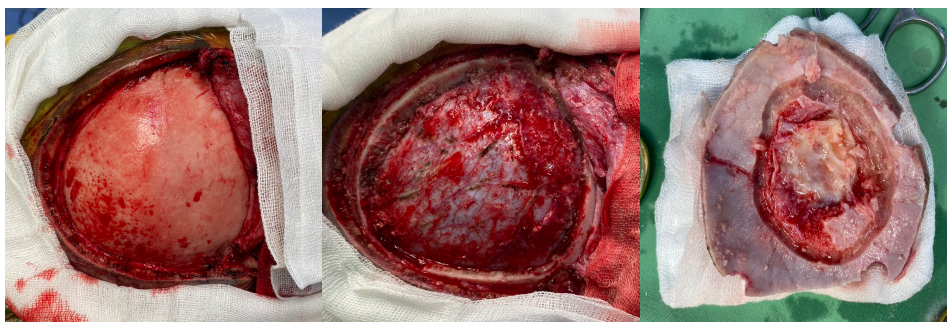


Figure 2: Craniotomy Tumor removal was performed.

## 3. Discussion

UBCs are generally asymptomatic, unless accompanied with other complications such as pathological fracture or repeated haemorrhages, where patients would often feel tenderness and pain at the site of lesion. [2]. The patient presented to the neurosurgery department with complaints of headache experienced by the

patient for the past year. A previous similar case of simple bone cyst in the calvarium reported patient with headache that the patient experienced for 4 years, another case of simple bone cysts of the cranial vault was found incidentally and the patient only complaint was headaches in the morning [4].

Pre-Op CT Scan Examination, shows an expansile sclerotic lytic lesion on the tabula diploe of the right parietal bone compressing the right parietal lobe. Similar to literature, UBC usually appear radiologically as a lesion with a lucent characteristics and small zone of transition, rim often found as sclerotic, and neighbouring cortex can be thinned. The lesion cortex is generally intact without cortical destruction [2]. A previous reported case found Pre op CT scan shows a cystic lesion of the skull vault, centred on the right parietal bone crossing the midline [4].

Generally, as a benign bone tumor, treatments are usually not required unless the lesion is large and symptomatic [2]. Our patient has complaints of headache for the past year worsen this three month, and an expansile sclerotic lytic lesion on the tabula diploe of the right parietal bone compressing the right parietal lobe causing with neurologic deficit of motoric function of the left extremities, indicating tumor removal.

To the best of our knowledge, we have not found any literature describing the best treatment for UBC of the parietal bone. In our case, direct approach craniotomy tumor removal was performed, incision using a horseshoe design on the right parietal bone. Thickening of the duramater was identified, duramater was cleansed using NaCL and povidone iodine, The duramater was drilled using a high-speed drill until flatten, a yellowish coloured bony lesion was discovered containing a semi-translucent substance, and some of the tissue was preserved for histopathological examination. Post operative follow up 2 weeks post operation, the patient shows a normal motoric function, with no complaint of pain. Just as a previous similar case of simple bone cysts in the calvarium, craniectomy was conducted removing the cystic skull lesion, a semi-translucent and light yellow- to white-coloured bony lesion was also identified [6] we have not found other cases describing treatments of UBC of the cranium which is most likely due to the rare location of this disease.

#### 4. Conclusion

UBC is a rare condition, that's scarcely located in the cranium. We have presented a case of symptomatic skull tumor, where the patient has symptoms of pain, and diminished motor strength. Through CT-Scan we found an expansile sclerotic lytic lesion on the tabula diploe of the right parietal bone compressing the right parietal lobe. Craniotomy tumor removal was conducted removing the lesion, histopathology examination confirmed the lesion to be a simple bone cyst or UBC. Post operative follow up the patient shows a normal motoric function, with no complaint of pain, thus we conclude that craniectomy tumor removal, and flattening of the duramater using high-speed drill is sufficient in treating this rare disease.

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