

## Osteochondroma: In a rare location inside of the skull

Intracranial osteochondroma

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### Abstract

Osteochondromas are benign bone tumors with a cap of hyaline cartilage. An 80-year-old female patient visited the neurology clinic with a complaint of headache. A calcified, pedunculated mass was detected in the left middle cranial fossa on non-contrast computed tomography images. Osteochondromas should also be considered in the differential diagnosis of intracranial bone lesions.

### Keywords

Osteochondroma, Skull, Computed Tomography, Magnetic Resonance Imaging

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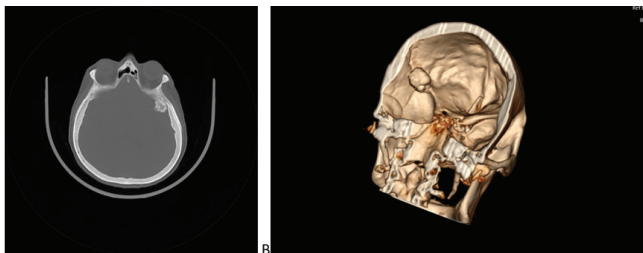
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## Introduction

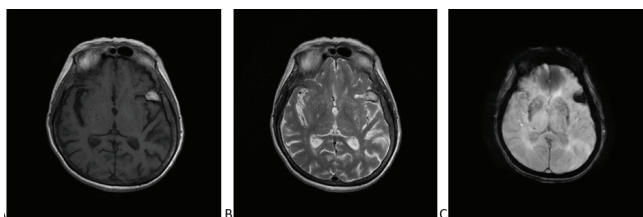
Osteochondromas are benign tumors composed of cortical and medullary bone with an overlying hyaline cartilage cap. Furthermore, they must demonstrate continuity with the underlying parent bone cortex and medulla. They are developmental lesions rather than true neoplasms. The radiologic features of osteochondromas are often pathognomonic and reflect their pathological appearance [1, 2]. Intracranial osteochondromas are relatively rare, representing 0.1-0.2% of all intracranial tumors [1, 3]. The literature consists only of sporadic case reports. We present an uncommon case of osteochondroma in the middle cranial fossa, originating from the sphenoid bone

## Case Report

An 80-years old woman visited the neurology clinic complaining of a headache that lasted for 1 month. Neurological examination was unremarkable. On non-contrast computed tomography images, a calcified pedunculated solid mass measuring 18 × 13 × 16 mm located in the left middle cranial fossa was detected (Figure 1). The mass appeared to be continuous with medulla of the underlying bone through a hypodense gap, compatible with cartilage tissue. No change in the characteristics or size of the mass was observed in follow-up CT images. On the non-contrast MRI images, an extra axial mass hyperintense in T1WI and T2WI, and hypointense in SWI was observed, with peripheral hypointense thin (<1 mm) cartilage cap (Figure 2). No peripheral edema was seen. Nearby cerebral parenchyma was minimally displaced. In this case, the mass was considered to be benign and unrelated to the patient's current complaints. Due to advanced age, chronic conditions and the relative absence of mass effect, the patient was not considered a candidate for surgery. Consequently, pathological confirmation of the diagnosis was not made.



**Figure 1.** A) Non-contrast computed tomography image in axial plane shows a bony pedunculated solid mass located in the left middle cranial fossa. B) 3D reconstructed image establishes mass that originates from the left greater wing of the sphenoid bone



**Figure 2.** T1WI (A), T2WI (B) and SWI (C) images reveal an extra axially located mass with high signal intensity on T1WI, T2WI and low signal intensity on SWI

## Discussion

Although osteochondromas tend to be benign, there is a slight possibility of around 1% for malignant transformation [2]. The thickness of the cartilage cap seen in MRI helps to assess the possibility of malignant transformation. Cartilage cap thickness of more than 2 cm indicates the possible malignant change [3, 4, 5].

Intracranial osteochondromas may arise at any age with the peak incidence in the third decade [6]. Because of the rare incidence of intracranial osteochondromas, the differential diagnosis with other more commonly found tumors, such as meningioma becomes essential. Differential diagnosis based on radiological findings also include osteosarcoma and other miscellaneous osteomatous lesions. Non-contrast CT scans usually show from hyperdense to isodense mass for meningiomas, and calcification is commonly seen [7].

Meningiomas are extra axial tumors and most common tumor of the meninges. They are typically well-rounded lesions originating from dura mater and characteristically exhibit 'dural tail' sign [7]. In this case mass lesion's origin from bony tissue excludes meningiomas. The mass' non-progressive nature during the follow-up scans, presence of cartilage cap and typical continuous appearance with the underlying bone medulla suggests osteochondroma to be the most likely diagnosis. Clinical manifestation of intracranial osteochondromas mostly depends on the tumor mass effect and location [8].

## Conclusion

In light of the literature and imaging findings, osteochondromas should be included in the differential diagnosis list of intracranial bone lesions.

## Scientific Responsibility Statement

The authors declare that they are responsible for the article's scientific content including study design, data collection, analysis and interpretation, writing, some of the main line, or all of the preparation and scientific review of the contents and approval of the final version of the article.

## Animal and human rights statement

All procedures performed in this study were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki Declaration and its later amendments or comparable ethical standards. No animal or human studies were carried out by the authors for this article.

## Conflict of interest

None of the authors received any type of financial support that could be considered potential conflict of interest regarding the manuscript or its submission.

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