

magnetic resonance imaging (MRI) showed the soft extracranial tissues partially affected by the tumor, without intracranial extension [Figure 1].

The patient underwent a left suboccipital approach in the park bench position. After the dissection of the soft tissues, the lesion was targeted according to anatomic landmarks. Under the operating microscope, the tumor was progressively removed, using high speed drills and rongeurs, up to the normal dura and surrounding normal bone. However, the left occipital condyle was left undisturbed [Figure 2; Video 1] (Supplemental Digital Content, illustrating the microsurgical removal of the lesion).

The postoperative course was uneventful, and the patient's symptoms disappeared. The histopathological examination was consistent with benign osteoblastoma, and the postoperative CT scan showed the complete resection of the lesion [Figure 3]. There was no recurrence during a 12-month follow-up.

DISCUSSION

Osteoblastomas comprise 1% of all bone tumors. Skull bones are affected in only 3% of the cases, and occipital osteoblastomas are even rarer. To the best of our knowledge, this is the 12th case reported in the last 40 years.^[2,5,14,15]

The presentation of the tumor is more frequent in men less than 30 years old; calvarian osteoblastomas essentially share the same characteristics of the osteoblastomas in other locations,^[10] and they are treated for intractable pain, increase in size, and bone destruction.^[20]

Occipital osteoblastomas present as circumscribed expansive intraosseous lesions between the inner and outer table of the occipital bone, with lytic and sclerotic appearance in plain radiographs and CT scans.^[2,16] CT angiography may help to describe the vascular supply of the tumor, thus estimating the necessity of a

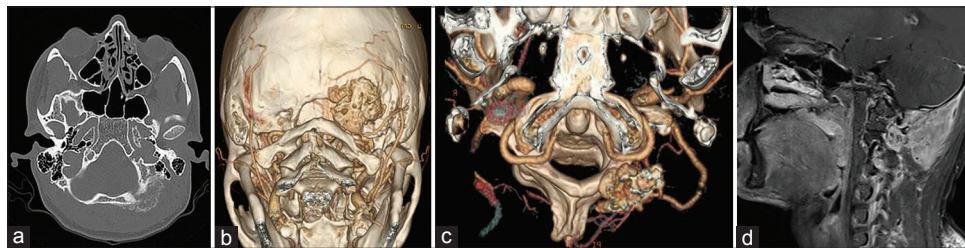


Figure 1: Preoperative images. (a) Axial CT scan showing a left osteolytic occipital lesion surrounded by sclerotic tissue extended inferiorly up to the foramen magnum. (b and c) 3D reconstructions of the CT angiogram illustrating the close relationship between the tumor and the vertebral and occipital arteries. (d) Sagittal post-contrast T1-weighted MRI scan revealing an avidly enhancing occipital extra-axial mass

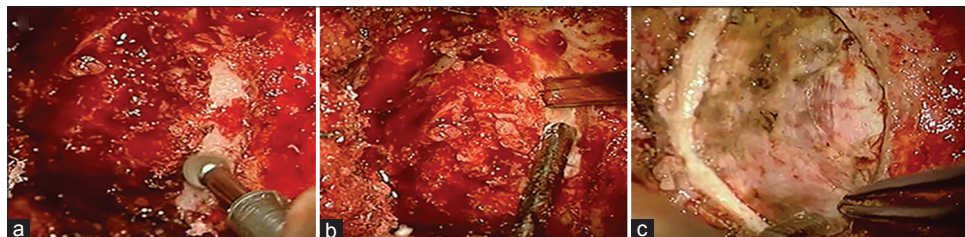


Figure 2: Intraoperative photographs. (a) Initial removal of the lesion with a high speed drill. (b) Removal of the lesion using a kerrison rongeur, once the dura is reached, in order to prevent inadvertent dural lacerations. (c) Surgical field at the end of the resection with the surrounding normal bone

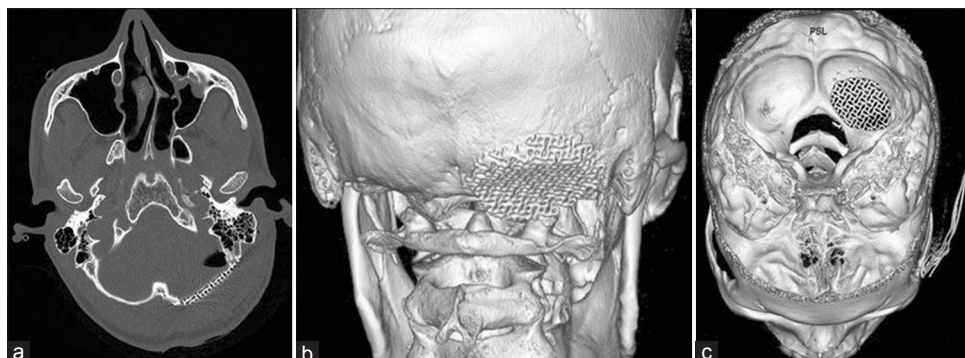


Figure 3: Post-operative images. (a) Axial CT scan showing the lesion was totally removed. (b and c) 3D CT scan reconstructions illustrating the reconstruction of the skull defect with a titanium mesh

presurgical embolization. The MRI is too variable to define the diagnosis of osteoblastoma, although it is very useful to determine the involvement of the adjacent soft tissues, as in our case.^[14,16]

Even though giant osteoid osteomas are reported, unlike osteoblastomas,^[4] they frequently have less than 15 mm in their maximal diameter, and the severe pain produced by them during the night is usually relieved by acetylsalicylic acid.^[12,20] On the other hand, osteosarcomas, dermoid cysts, intradiploic meningiomas, as well as eosinophilic granulomas may also mimic osteoblastomas.^[17,19] Only the histopathological examination, which is characterized by irregular bony trabeculae surrounded by osteoblasts and osteoid tissue, will define the diagnosis.^[5,14]

The recurrence of osteoblastomas after surgery is approximately 9.8–15%.^[20] They may show sarcomatous changes, local extension into the extraskelatal soft tissues, and may even metastasize.^[13,17] Their clinical outcome is basically related with the completeness of the resection and with their location. Apparently, osteoblastomas confined to short and flat bones have a more aggressive behavior, which leads us to conclude that the resection of osteoblastomas must be as large as possible. Hence, in the case of a tumor located in the occipitocervical junction, a stabilization may be required, as well as the transposition of the vertebral artery.^[3,7] However, occipitocervical stability is not compromised if less than one-half of the C0–C1 joint is removed.^[6,8,18] Some osteoblastomas may be hypervascularized, thus requiring a preoperative embolization by using particles or some another kind of endovascular agents.^[2] Because of the risk of recurrence, a careful follow-up of the patient is essential.^[7]

In summary, occipital osteoblastomas are extreme rare benign bone tumors with typical histological features, sometimes hypervascularized, and with a high tendency to recur when they are not completely resected. At times, their treatment may require presurgical embolization, occipitocervical fusion, and/or transposition of the vertebral artery. Their high risk of recurrence makes necessary an appropriate monitoring of the patient.

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Conflicts of interest

There are no conflicts of interest.

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