

# Osteoid osteoma total resection at frontal bone. case report

## Summary

Frontal osteomas are benign neoforations, which often remain asymptomatic throughout a patient's life or develop a cosmetic disfigurement. Diagnosis is usually by chance, and can result from various stimuli, such as accidental or surgical trauma, acne scars, and skin tumors, however in the absence of currently known triggering factors.

**Case report:** 85 years female patient who reports the onset of the current disease 20 years prior to the first medical consult, characterized by a progressive frontal tumor growth that was self-detected, with an aesthetical awkwardness and progressive headache. At the frontal region she had an impressive increase in volume is evidence emerging from the external cortical of the frontal bone, non-mobile consistency, adhered to deep planes. For this reason, a simple tomographic study was performed and shows a probable osteoid osteoma. The patient was taken to the operation room, performed a transverse incision in the line of implantation of the scalp, division through planes and soft tissues until reaching a bone lesion at the expense of the external table of the left frontal region, and was completely resected. The histological results of the biopsy reports an osteoid osteoma.

**Discussion:** despite the increasing use of endoscopic procedures, open approach via coronal incision remains the gold standard for frontal sinus osteoma with lower recurrence rates.

**Conclusion:** Osteoid osteomas are a relatively frequent benign bone tumors that have a slow growth and are usually asymptomatic, however with the past of the years can develop headache and cosmetic uncomforted.

**Keywords:** frontal osteoma, osteoid osteoma, resection, surgical, bone tumor

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## Introduction

Skull base osteomas are rare neoforations, which often remain asymptomatic throughout a patient's life. Diagnosis is usually by chance, but rarely these can produce exceptional ophthalmologic and neurological complications apart from cosmetic disfigurement.<sup>1</sup> Cutaneous ossifications are unusual pathological processes that occur with the formation of bone tissue within the dermis and hypodermis; they are classified as either primary or secondary. The secondary forms are more frequent and can result from various stimuli, such as accidental or surgical trauma, acne scars, and skin tumors, whereas the primary forms develop in the absence of currently known triggering factors.<sup>2</sup> It was first described by Bergstrand in 1930 and characterized by Jaffe as an entity in 1935. It usually affects young males less than 30 years old and is often localized in the cortex of long bones. Nocturnal pain that alleviates with salicylates or nonsteroidal anti-inflammatory drugs (NSAIDs) should raise suspicion for the presence of osteoid osteoma.<sup>3</sup> The commonly affected areas in the skull are the cranial vault, maxilla, mandible, external auditory canal, and paranasal sinus. Differential diagnosis on imaging includes osteoblastoma, which is also a benign tumor but malignant transformation into osteosarcoma was reported.<sup>4</sup> In addition, many conditions may mimic osteoid osteoma and vice versa, leading to misdiagnosis. Therefore, it is essential to understand these musculoskeletal diseases and their imaging findings to increase diagnostic accuracy, enable early treatment and prevent poor prognosis.<sup>5</sup> Here, we report a case of an elderly hypertensive woman, with a clinic of headache and inestetical growing frontal tumor who requires a total surgical resection.

## Case report

An 85 years old female patient from Guarenas, Miranda state, with a history of arterial hypertension, who reports the onset of the current disease 20 years prior to the first medical consult, characterized by a progressive frontal tumor growth that was self-detected, with an important aesthetical awkwardness and progressive headache, which is why she goes to the Plastic and Reconstructive Unit of the Caracas University Hospital (Figure 1). With a personal history of a controlled hypertensive cardiopathy, on physical examination, the patient was in well general condition, neck and head at the frontal region she had an impressive increase in volume is evidence emerging from the external cortical of the frontal bone with irregular edges, of firm, non-mobile consistency, adhered to deep planes, approximately 2.4 x 1.5 cm. For this reason, a simple tomographic study was performed progressing from the base to the vertex, with multiplanar reconstruction and bone window: At the level of the external cortex of the right frontal bone, a hyperdense exophytic image in the calcium range, with defined edges, with a hypodense center with a trabeculated appearance, measures 2.3 x 1.45 x 2.1 cm. There were no lytic lesions or fracture lines in the cranial vault without soft tissue involvement (Figure 2 & 3). For this reason, with the respective preoperative aconditionation and appropriate blood pressure levels, the patient was taken to the operation room and performed following rules of asepsis and antisepsis, under sedation, supine position, placement of surgical fields, a transverse incision is made in the line of implantation of the scalp, division through planes and soft tissues until reaching a Bone lesion at the expense of the external table of the left frontal region

of approximately 4 x 3 cm of firm consistency, edges are released, use of osteotome and disinsertion of the osteoma of the frontal bone, use of electro scalpel and application of bone wax, verification of hemostasis, closure by planes with vicryl 4-0 and prolene 4-0. Final cure. The histological results of the biopsy reports an osteoid osteoma completely resected (Figure 4).



Figure 1 Caracas University Hospital. Caracas, Venezuela.



Figure 2 & 3 A preoperative pictures showing an osteoma of the forehead (blue arrow, osteoma of the forehead) in an elderly female patient.

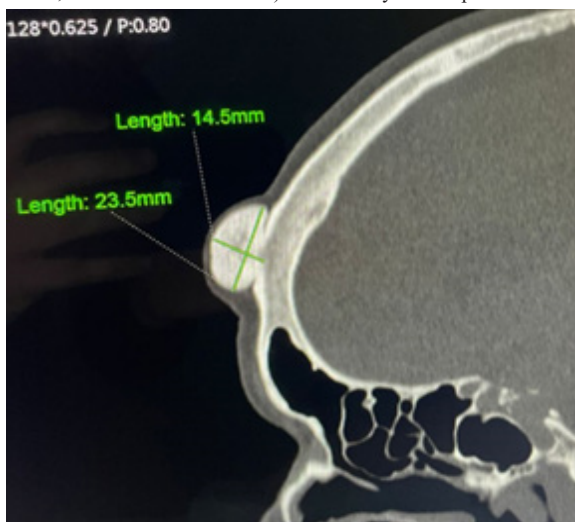


Figure 4 At the external cortical level of the right frontal bone, hyperdense exophytic image in the calcium range, with defined edges, with a hypodense center with a trabeculated appearance compatible with probable osteoid osteoma.

## Discussion

Osteomas are the most common tumors of the cranial vault and facial skeleton. They can occur in any part of the skull, both in the frontal and parietal bones. They are usually benign, and their symptoms are facial deformity, facial pain, and headache. Their treatment is

indicated when their symptoms are present, and it is desirable to remove them for cosmetic purposes.<sup>6</sup> According to Seong Hwan Kim, Dong Seob et al.<sup>7</sup> osteomas are benign, slow-growing tumors that arise most frequently in the craniomaxillofacial region. They grow slowly and painlessly. The clinical signs depend on the size and location of the tumor, as well as the direction of its growth.<sup>7</sup> All those facts have relation with our case where the patient has a frontal mass of slow growing (self-detected around 20 years before). However has not relation with the same authors when they describe that this benign tumor most commonly occur in the maxilla and the mandible.<sup>7</sup> Also, according to Carneiro B, Da Cruz I et al.<sup>5</sup> these tumors are highly vascularized and innervated, and the physiopathology of pain seems to be related to high levels of prostaglandins increasing the pressure in an innervated bone area within the nidus, particularly in the reactive zone, facts that has relation with the patient pain evolution of our case.

When the patient was diagnosed, she had a controlled hypertensive cardiopathy as a in important antecedent, this finding has relation with the published last year by Sood C, Vig V, Kashif A et al.<sup>8</sup> because they describe a rare case of soft tissue osteoma of hand in an hypertensive elderly woman. These tumors can cause different symptoms when they compress the surrounding tissue. In this case, the patient refers progressive headache having relation with the described by Aksakal Ceyhun<sup>9</sup> who says that disturbances in the frontal sinus drainage or the surrounding tissue may cause symptoms of sinusitis, as well as unilateral localized or bilateral headache.

Following this findings, the case report an impressive increase in volume emerging from the external cortical of the frontal bone, having relationship with the exposed by Watanabe N, Tsurubuchi T et al.<sup>4</sup> when they said osteoma in the cranial vault usually grows outward, while osteoma arising from the paranasal sinus is often reported with intracranial involvement. At the first diagnosis steps, according to Parmeggiani A, Martella C et al.<sup>10</sup> typical radiographic findings of osteoid osteoma include an intracortical radiolucent nidus associated with cortical thickening and reactive sclerosis, that at computed tomography (CT) examination manifests as a well-defined area of low attenuation with central high attenuation focal spot representing mineralized osteoid, all those findings presents in the CT of the patient.

Regarding surgical treatment, we perform a total open resection of the mass, being a simple and quickly way of solve the patients problem, having strong relation with the published by Ba Leun Han and Ho Seong Shin<sup>6</sup> who said that a simple resection is generally performed, but it scars the skin, and also described other alternatives like the endoscopic resection for small tumors, which highlights the importance of implementing endoscopic approaches in the treatment of lesions of the frontal region in plastic surgery residencies in Latin America according also with Yang N, Bu L, Shan X et al.<sup>11</sup> when publish that current methods to remove osteomas include endoscopy, open surgery, and combination of both. However, according Bianchi G, Zugaro L et al.<sup>12</sup> the treatment of osteoid osteoma has changed in the last decades, and the percutaneous thermal ablation techniques are now considered as the gold standard due to their feasibility, safety, and effectiveness.

Finally we can affirm, that the open surgery was still an appropriate alternative taking the words of Zahrou F, M'barek YA, Benantar L et al.<sup>13</sup> who said that despite the increasing use of endoscopic procedures, open approach via coronal incision remains the gold standard for frontal sinus osteoma with lower recurrence rates, wich also have relation with the publication of Napora J, Walejko S, Mazurek T<sup>14</sup> who described very effective therapies for this tumour such as ablation and

surgical resection. Meanwhile, other authors like Man Shu, Jin Ke<sup>15</sup> said that open surgery and cryoablation can be selected for osteomas close to the nerve and atypical sites, while radiofrequency ablation and microwave ablation can be selected for osteoid osteomas in most other sites. According to the experience of Liangliang M, Xiao Z<sup>16</sup> only one patient in the surgical resection group experienced a recurrence at 29 months postoperatively and underwent a second resection, a fact that confirms the effectiveness of the classical surgical resection.

## Conclusion

Osteoid osteomas are a relatively frequent benign bone tumors that have a slow growth and are usually asymptomatic, however with the past of the years can develop headache and cosmetic discomfort. For that reason, a correct diagnosis with an images and successfully surgery can improve the quality of life of the patients with these tumors.

## Ethical approval

This research complies with the World Medical Association Declaration of Helsinki on medical protocols and ethics. As the images of the patient were essential to this paper, the patient's grandson written consent.

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## Conflicts of interest

The author declares no conflicts of interest.

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