Therapeutic approach of a giant frontal osteoma on a 12 year old child – case report

V. Budu^{1,2}, Lavinia-Georgiana Sava¹, C. Ioniță¹, A. Panfiloiu¹, Tatiana Decuseară¹, Alexandra Guligă¹, Andreea-Nicoleta Costache¹, I. Bulescu², M. Tuxoaliu^{1,2}

¹*Institute of Phonoaudiology and Functional ENT Surgery „Prof. Dr. D. Hociotă”, Bucharest, Romania*

²*University of Medicine and Pharmacy „Carol Davila”, Bucharest, Romania*

Abstract

Osteomas are the most frequent benign tumors of the paranasal sinuses. The investigation of choice for diagnostic is computed tomography, which shows the extension and the relationship with the surrounding structures. Symptomatology varies from headache and facial pressure, to mucopurulent discharge, facial asymmetry, though many osteomas remain asymptomatic. Symptomatic and complicated osteomas require surgical treatment.

The authors are presenting the case of a 12 year old patient who referred to our clinic with headache and facial deformity. The CT scan showed a tumoral mass of bony density situated in the left frontal sinus, with orbital implication. Considering the dimension and localization of the tumor we opted for a combined surgical approach in order to remove the osteoma and used a titanium plate for the reconstruction of the anterior wall of the frontal sinus.

For giant frontal osteomas, the combined approach assures the complete resection of the tumor and permeability of the frontal recess. In pediatric patients the therapeutic management must also take into consideration future development and cosmetic appearance of the patient.

Key words: frontal osteoma, frontal sinus surgery, titanium plate

Introduction

Osteomas are benign tumors, which can be found in the paranasal sinuses. They have a slow growth and often are an incidental finding. Up to 80% are located in the frontal sinus, followed by the ethmoid sinus and most rare the sphenoid and maxillary sinuses [1], [2]. Most common symptoms are headache and tenderness, due to sinus drainage obstruction. Other symptoms may be mucopurulent discharge, proptosis, though a great number of osteomas remain asymptomatic [2]. Depending on the size and localization, complications may be ophthalmological, sinus related or intracranial. Small, asymptomatic osteomas don't require surgical treatment. In these cases a periodical examination is indicated. On the other hand, ostial obstruction, facial deformity, proptosis or any other complication, are firm indications for surgery.

Case report

A 12 year old female patient presented to our clinic with frontal headache, with no response to usual treatment. Clinical examination showed left deformity of the forehead, mild hypertelorism and a normal ophthalmological exam, with normal eye movement and sight. Laboratory results did not show any modifications.

The diagnostic protocol in our clinic includes a nasal endoscopic examination and a computed tomography. The nasal endoscopy showed a hyperemic nasal mucosa and no other signs of tumor pro-

trusion. Computed tomography indicated a tumoral mass of bony density located in the left frontal sinus with orbital implication. An MRI is necessary only when endocranial or orbital complications are suspected.

The CT examination showed a tumoral mass of bony density with orbital extension, which occupied most of the frontal sinus and obstructed the frontal recess; it presented anterior extension, with the destruction of the anterior frontal wall (figure 1).

Figure 1: CT of the left frontal sinus

Considering the age, clinical presentation and imagistic findings we decided for surgical removal of the tumor. Because of the tumor dimension, orbital and anterior extension we decided to use a combined technique, endoscopic and external approach.

Under general endotracheal anesthesia, we performed an endoscopic evaluation of the nasal cavity, removed the uncinate process, identified the frontal recess and removed its contents.

The second part of the surgery consisted in the external approach of the tumor. After infiltrating a vasoconstrictor into the surgical area and through a left suprabrow incision extended to the medial lower angle of the eyebrow, we dissected the muscular plans and exposed the left frontal sinus. Using a diamond burr, we drilled and removed the osteoma from the frontal sinus and sent it for histopathological examination (figure 2).

Figure 2: Osteoma of the left frontal sinus – intraoperative view

In an endoscopic manner we created a large communication between the nasal cavity and the frontal

sinus drilling the frontal recess and frontal sinus ostium (figure 3).

Figure 3: Frontal recess and frontal ostium

The reconstruction of the anterior wall was completed using a titanium plate, fixed with two screws. It was mandatory to use the titanium plate in order to reconstruct the osseous eyebrow in order to obtain

a normal aspect of the face with no deformities. We applied a resorbable sponge into the frontal sinus and in the middle meatus and used hemostatic sponge for left nasal packing (figure 4).

Figure 4: Final aspect of frontal surgery

The patient had a positive evolution. Postoperative treatment consisted in intravenous antibiotics, anti-inflammatory, hemostatics, antihistamines and daily application of nasal ointment to prevent crust formation. Nasal packing removal was performed 24 hours after surgery, with minimal bleeding. Follow-up until present time was at one week and one month after surgery, when the nasal endoscopic examination showed a normal healing. The histopathological exam confirmed the diagnostic of spongy osteoma.

Discussions

Osteomas are benign tumors which can occur at any age, with the highest incidence between second and third decade of life and with a 2:1 male to female ratio [1]. Even though, in children they are rare findings. Tumors greater than 30 mm and with more than 110 g in weight are considered giant osteomas [3]. There are three theories to explain the ethiopathogenesis of osteomas: embryologic theory, saying osteomas occur at the junction between the ethmoid and frontal bone, the traumatic theory, which identifies history of trauma in these patients and the infectious theory [4]. Symptomatology varies with the location and dimension of the tumor. Conservative management may be considered for asymptomatic, small osteomas. For giant, symptomatic or complicated osteomas surgery is the treatment of choice [5]. Computed tomography is the gold standard for assessing the extension and the relationship with the adjacent structures. The CT indicated a tumoral

mass occupying more than 50% of the frontal sinus and blockage of the frontal recess, which are indications for surgical treatment [6].

In our case, we took into consideration the dimension of 3 x 3 cm of the tumor, the location and extension of the osteoma through the anterior wall of the frontal sinus and towards the medial end of the bony eyebrow, the computed tomography findings and decided for a surgical management with a combined approach, endoscopic and external. The aim of the surgery was to completely remove the tumoral mass, with a minimal impact on the surrounding structures. The tumor caused left facial deformity and had an important impact on the quality of life of our patient. The aesthetic goal of the surgery was to avoid the depression of the forehead, after healing, so we decided to use a titanium plate to sustain the overlying plans. Considering the age of the patient we fixed the plate in a loose manner, to permit further development.

Conclusions

A giant, symptomatic osteoma requires surgical management. The surgical approach is decided only after a computed tomography exam with reconstructive images. The combined technique, endoscopic and external approach represents the gold-standard for the complete removal of the tumor and maintains the physiological drainage of the frontal sinus through the frontal recess. In pediatric patients future development of the patient must be considered together with the cosmetic factor.

Bibliography

- [1] Vishwakarma R, Joseph ST, Patel KB, Sharma A, Giant Frontal Osteoma: Case Report with Review of Literature, Indian Journal of Otolaryngology and Head & Neck Surgery, 2011, 63(1), 122–126.
- [2] Strek P, Zagólski O, Składzień J, Kurzyński M, Dyduch G, Osteomas of the paranasal sinuses: surgical treatment options, Medical Science Monitor, 2007, 13(5): 244–250.
- [3] Cheng, K., Wang, S., Lin, L., Giant osteomas of the ethmoid and frontal sinuses: Clinical characteristics and review of the literature. Oncology Letters, 2013, 5.5: 1724–1730.
- [4] Maroldi R, Berlucchi M, Farina D, et al, Benign Neoplasms and Tumor-Like Lesions, Imaging in treatment planning for sinonasal diseases, 2005, Springer, 107–110.
- [5] Chiu AG, Schipor I, Cohen NA, et al, Surgical decisions in the management of frontal sinus osteomas, American Journal of Rhinology, 2005, 19(2): 191-197;.
- [6] Sumers LE, Mascott CR, Tompkins JR, et al, Frontal Sinus Osteoma associated with cerebral abscess formation: a case report, Surgical Neurology, 2001, 55(4): 235–239.

Correspondent author:

Lavinia-Georgiana Sava,
e-mail : sava.lavinia@gmail.com