



ETHMOID SINUS OSTEOMA – CASE REPORT

Aleksandra BERNAT¹, Maciej FUS¹, Andrzej WOJDAS¹

¹ Department of Otolaryngology, Military Institute of Aviation Medicine, Warsaw, Poland

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Author's address: A. Bernat, Military Institute of Aviation Medicine, Krasinskiego 54/56 Street, 01-755 Warsaw, e-mail: abernat@wiml.waw.pl

Abstract: Osteomas are benign bone tissue tumors, predominantly asymptomatic, which means that most cases require only observation. Large tumors, however, can cause various symptoms depending on their location.

Case Report: This study describes a case of a 63-year-old female patient with an osteoma of the right ethmoid sinus, presenting symptoms of headaches and chronic sinusitis. The lesion was completely removed using an endoscopic approach.

Discussion: The authors discuss the possibilities and risks associated with the removal of osteomas using an endoscopic approach.

Conclusions: Currently, endoscopic surgery is replacing traditional approaches due to better final outcomes.

Keywords: headaches, ethmoid sinuses, osteoma, endoscopic surgeries

Figures: 3 • **References:** 23 • **Full-text PDF:** <http://www.pjambp.com> • **Copyright** © 2024 Polish Aviation Medicine Society, ul. Krasieńskiego 54/56, 01-755 Warsaw, license WIML • **Indexation:** Index Copernicus, Polish Ministry of Science and Higher Education

INTRODUCTION

Osteomas of the paranasal sinuses are benign tumors composed of bone tissue. They most commonly occur in the frontal sinus and its recess, as well as in the ethmoid cells. These tumors typically appear in the fifth decade of life and are more common in men [3,9,23].

Generally, osteomas are asymptomatic and are often diagnosed incidentally during radiological examinations of the head [9,18,22]. The characteristic symptoms of paranasal sinus osteomas include headaches, nasal obstruction, and recurrent sinusitis, which are closely related to the tumor's size and anatomical location [14,22]. If an osteoma is located within the lamina papyracea, symptoms such as diplopia, vision disturbances, and proptosis may occur [9,14,22]. In cases where an osteoma causes dura mater destruction, complications such as meningitis, intracranial pneumocephalus, and cerebrospinal fluid leakage have been reported [3,9,14,19].

Small osteomas that are non-growing do not require treatment but should be closely monitored through periodic computed tomography (CT) scans, typically at 12-month intervals. These scans, ideally with three-dimensional assessment, help determine the osteoma's size and its relationship to adjacent anatomical structures [14,10]. The average growth rate of osteomas ranges from 0.6 to 1 mm per year, and tumors within this range usually require surgical removal [5,10,13].

The choice of surgical technique depends on the tumor's size, location, and the operating team's expertise. Surgical approaches are classified into external, endoscopic, and hybrid procedures, the latter combining intranasal and external access [10,18,22].

This paper presents the case of a patient with a posterior ethmoid osteoma, surgically treated via an intranasal approach.



Fig. 1 Computed tomography in planes – transverse, sagittal, frontal. An osteoma visible in the right ethmoid sinus.

DESCRIPTION OF THE CASE

A 63-year-old female patient was admitted to the Department of Otolaryngology due to an osteoma of the right ethmoid sinus. For approximately two years, she had reported recurrent headaches, frequent upper respiratory tract infections, and nasal obstruction, particularly on the right side. A CT scan revealed a well-calcified focal lesion with the morphology of an osteoma located in the posterior ethmoid sinus on the right side, adjacent to the nasal septum, measuring 18 x 12 x 21 mm. Additionally, significant thinning of the ethmoid lamina was noted near the upper margin of the lesion, without evidence of invasion or infiltration into the base of the middle cranial fossa. The lesion caused obstruction of the right common nasal passage and, in its upper section, displaced the nasal septum toward the left

side, narrowing the left common nasal passage. Anterior rhinoscopy revealed a right-sided bony spur compressing the middle nasal concha and bilateral concha bullosa. General physical and laryngological examinations did not reveal any other abnormalities. The patient had no history of chronic diseases or allergies.

On May 22, 2023, a procedure to remove the osteoma from the right ethmoid sinus was performed under general anesthesia. Under endoscopic guidance, a bony spur of the septum and an aerated middle nasal concha were identified. The middle concha was resected to improve surgical access to the posterior ethmoid sinus, where the tumor was located. The osteoma was then removed in fragments after the tumor's attachments to the nasal septum and middle nasal concha were drilled away. Following the osteoma's

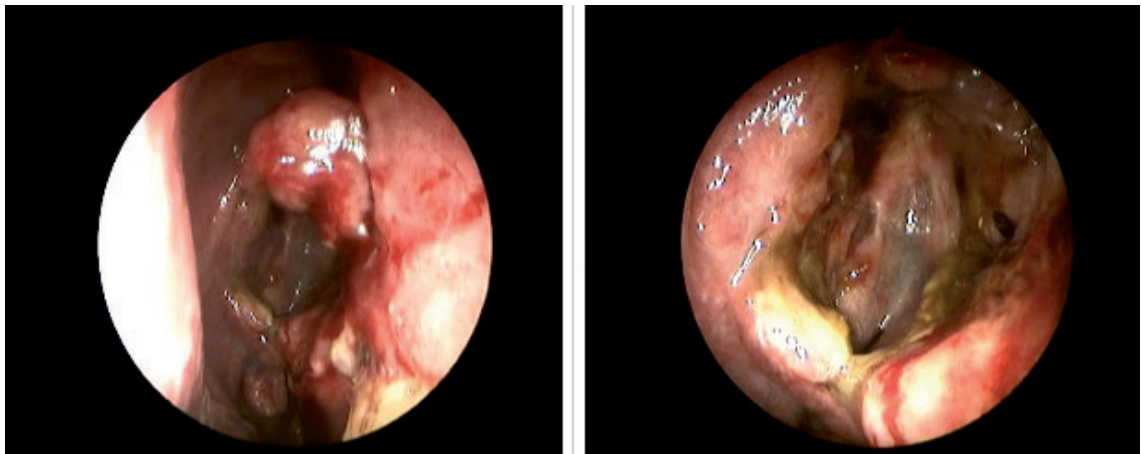


Fig. 2 Postoperative cavity viewed with a 0° endoscope on the 14th day after surgery.



Fig. 3 Computed tomography performed three months after surgery. The postoperative cavity is visible in sagittal, coronal, and transverse planes.

removal, a bone defect measuring approximately 3 x 5 mm was identified in the posterior part of the ethmoid lamina, with the dura mater visibly intact. The bony defect was covered with a pedicled mucosal flap from the nasal septum.

Postoperatively, the patient reported good general well-being with no headaches. She only mentioned slight weakness. She was discharged home the following day.

Histopathological examination revealed fragments of the mucosa, primarily fibrous stroma, with chronic inflammation and hemorrhagic extravasations. Additionally, a fragment altered artifactually, likely corresponding to bone, with cells showing osteoblastic differentiation, was observed. No signs of necrosis or mitotic activity were detected.

Three months after the procedure, the postoperative cavity was fully healed. Follow-up CT examination showed postoperative changes in the form of bone defects in portions of the walls of the right ethmoid cells, the bony part of the nasal septum, and the right middle nasal concha.

DISCUSSION

Osteomas are the most common benign tumors of the paranasal sinuses. Their pathogenesis remains unknown, though suggested causes include trauma, infection, or bone tissue developmental disorders [3,20]. Most sinus osteomas, particularly those of small size, are asymptomatic. As the tumor enlarges, symptoms begin to appear. Patients most frequently report headaches and nasal obstruction. If the osteoma blocks the sinus opening, symptoms of inflammation in the obstructed sinus may develop. Ocular symptoms, such as double vision or impaired visual acuity, arise as a result of the tumor invading orbital structures [14]. The presence of these symptoms is an indication for surgical treatment. For asymptomatic osteomas, observation with radiological monitoring seems to be an appropriate approach. However, it is essential to note that some osteomas may grow rapidly, significantly increasing in size [18]. Osteomas are classified into small and giant categories. Giant osteomas are defined as those exceeding 30 mm in size [1].

Our patient reported headaches and nasal obstruction. She also complained of recurrent nasal

and paranasal sinus infections; however, no inflammatory changes in the sinuses were observed on the CT scan. Considering the confines of the right ethmoid sinus, the osteoma measuring 18 x 12 x 21 mm was relatively large, although it fell within the classification of small osteomas according to established terminology. The osteoma was located in the posterior right ethmoid sinus, lateral to the nasal septum and just below the ethmoid lamina, without evidence of invasion or infiltration into the anterior cranial fossa. A section of the ethmoid lamina was described as thinned.

The patient was qualified for endoscopic treatment following current recommendations [9,15,20,22]. Ethmoid osteomas, especially those situated just below the skull base, must be operated on with particular caution to avoid cerebrospinal fluid leakage, the most serious complication of this procedure [11,12,18]. In some cases, it is necessary to rotate the osteoma after mobilization to facilitate its removal from the ethmoid sinus. Frequently, partial milling of the tumor is required to reduce its mass and volume for safe removal [1,9,18]. This maneuver was employed during the surgery performed on our patient.

With the advancement of technology, and consequently surgical instrumentation, the use of a bone drill has become standard even during endoscopic removal of osteomas from the frontal recess or frontal sinus [8,18]. Currently, most osteomas of the frontal sinus are operated on via an endoscopic approach, with the only significant obstacles being an excessively narrow frontal sinus opening and the prolonged duration of the procedure [9].

CONCLUSIONS

Osteomas are benign tumors originating from bone, and their symptoms depend on their location and size.

The decision to proceed with surgical treatment should be made individually, based on the symptoms, location, and size of the osteoma.

The rapidly developing field of endoscopic surgery is, in some cases, replacing traditional approaches due to its lower invasiveness, shorter hospital stays, and minimal cosmetic impact.

AUTHORS' DECLARATION:

Study Design: Aleksandra Bernat, Maciej Fus, Andrzej Wojdas. **Collection of data:** Aleksandra Bernat, Maciej Fus, Andrzej Wojdas. **Manuscript preparation:** Aleksandra Bernat, Maciej Fus, Andrzej Wojdas. The authors declare that they have no conflicts of interest.

REFERENCES

1. Alkhaldi AS, Alsalamah S, Tatwani T. A Case of Giant Ethmoid Sinus Osteoma. *Cureus*. 2021; 13(9): e18011.
2. Alkhatatba W, Algarni S. Cartilaginous Fibrous Osteoma of the Ethmoid Sinus. *Cureus*. 2021; 13(11): e19378.
3. Beldzińska K, Mollin E, Brzoznowski W, Skorek A. Kostniaki głowy w materiale Kliniki Otolaryngologii w Gdańsku w latach 2012-2019. *Pol Otorhino Rev*. 2021; 10(1): 18-21.
4. Brunori A, de Santis S, Bruni P. Life threatening intracranial complications of frontal sinus osteomas: report of two cases. *Acta neurochir*. 1996; 138: 1426-1430.
5. Buyuklu F, Akdogan MV, Ozer C, Cakmak O. Growth characteristics and clinical manifestations of the paranasal sinus osteomas. *Otolaryngol Head Neck Surg*. 2011; 145(2): 319-323.
6. De Filippo M, Russo U, Papapietro VR et al. Radiofrequency ablation of osteoid osteoma. *Acta Biomed*. 2018; 89: 175-185.
7. Gotlib T. Endoscopic surgery of the frontoethmoidal osteomas. *Braz J Otorhinolaryngol*. 2018; 84: 260-261.
8. Gotlib T. Wewnętrzna chirurgia zatoki czołowej – operacje z dostępu Draf III Terapia. 2010, 6(242): 31-34.
9. Gotlib T. Wewnętrzna endoskopowa chirurgia kostniaków zatoki czołowej i zachyłka czołowego. *Pol Otorhino Rev*. 2012; 1(2): 132-135.
10. Gotlib T., Held-Ziółkowska M., Niemczyk K. Frontal sinus and recess osteomas: endonasal endoscopic approach. *B-ENT*. 2014; 10: 141-147.
11. Gotlib T, Krzeski A, Balcerzak A, Niemczyk K. Jatrogenne płynotoki w przebiegu operacji osteoplastycznych zatoki czołowej. *Otolaryngol Pol*. 2009; 63(3): 242-244.
12. Gotlib T, Kuźmińska M, Kołodziejczyk P, Niemczyk K. Osteoma involving the olfactory groove: evaluation of the risk of a CSF leak during endoscopic surgery. *Eur Arch Otorhinolaryngol*. 2020; 277(8): 2243-2249.
13. Koivunen P, Lopponen H, Fors AP, Jokinen K. The growth rate of osteomas of the paranasal sinuses. *Clinical Otolaryngology & Allied Science*. 1997; 22(2): 111-114.
14. Kowalczyk K, Komoń-Kotecka E, Kaczmarczyk D, Niemczyk K. Odwracalne zaburzenia widzenia w przebiegu kostniaka sitowia tylnego penetrującego do przedniego dołu czaszki. *Pol Otorhino Rev*. 2013; 2(4): 230-233.
15. Lee DH, Jung SH, Yoon TM, Lee JK, Joo YE, Lim SC. Characteristics of paranasal sinus osteoma and treatment outcomes. *Acta Otolaryngol*. 2015; 135: 602-607.
16. Miłośki J, Pietkiewicz P, Urbaniak J et al. Unilateral pathological lesions of paranasal sinuses removed by endoscopic surgery. *Otolaryngologia Polska*. 2014; 68: 83-88.
17. Mroczek B, Nowaczyk M, Miętkiewska-Leszniwska D, Leszczyńska M. Kostniak zatok przynosowych u 53-letniego pacjenta – opis przypadku. *Postępy w Chirurgii Głowy i Szyi*. 2016; 1: 22-25.
18. Oleś K, Stręk P, Wiatr M, Składzień J, Tomik J, Morawska A, Szaleniec J. Endoskopowe leczenie olbrzymich kostniaków podstawy czaszki. *Otolaryngol Pol*. 2011; 65(6): 410-13.
19. Onal B, Kaymaz M, Arac M, Dogulu F. Frontal sinus osteoma associated with pneumocephalus. *Diagn Interv Radiol*. 2006; 12: 174-176.
20. Piotrowski S, Jagłowska M. Olbrzymi kostniak zatoki czołowej – opis przypadku i analiza literatury. *Pol Otorhino Rev*. 2022; 11 (1): 45-49.
21. Rot P, Szczygielski K, Skrzypiec Ł, Jurkiewicz D. Wpływ śródoperacyjnego leczenia antyseptycznego w trakcie endoskopowej operacji zatok na wczesne wyniki pooperacyjne. *Polish Journal of Otolaryngology*. 2021; 75(4): 27-32.
22. Stręk P, Zagólski O, Składzień J et al. Endoskopowe leczenie chorych z kostniakami zatok przynosowych – doświadczenia własne. *Otolaryngol Pol*. 2007; 61(3): 260-64.
23. Szyfter W. Nowotwory w otolaryngologii. *Termedia*, Poznań 2015; 134-45.

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