

Case Report

Sphenoid Sinus Osteoma: Report of a Case

ABSTRACT

Paranasal sinus osteomas, especially those located in the sphenoid sinus, are rare lesions. They are usually solitary, benign and asymptomatic lesions and detected incidentally. We report a case of sphenoid sinus osteoma that was detected during investigations for otitis media. The patient was operated using the transnasal endoscopic approach. Pathological examination revealed an osteoma. The patient was discharged on the postoperative 3rd day without any problems.

KEY WORDS: Endoscopy, Osteoma, Sphenoid sinus

INTRODUCTION

Sphenoid sinus osteomas are benign and rare tumours of paranasal sinuses. They are generally slow-growing tumours with a growth rate of 0.44-6 mm/year (14). Paranasal sinus osteomas are usually asymptomatic and detected incidentally. The most common symptom of paranasal sinus osteomas is non-specific headache. The incidence has been shown to be from 0.014% to 0.43% with a slight male predilection (6,27). Paranasal sinus osteomas generally present as solitary lesions. Treatment options for sphenoid osteomas are still controversial. Lame reviewed the relevant literature and found that only 12 cases had been reported since 1800 (16). A few additional cases were later reported (4, 18, 21, 22).

CASE REPORT

A 43-year-old woman was admitted to our clinic with a history of non-specific headache and a diagnosis of a mass lesion in sphenoid sinus. She had no history of head trauma or nasal surgery. She had been treated for left otitis media 6 months before her admission to our clinic. Her neurological and nasal examination was normal. Blood tests were within normal limits. There was no visual field abnormality. A paranasal sinus CT (coronal) was performed and showed a very dense mass lesion that completely filled the sphenoid sinus (Figure-1D). There was no extension beyond the sinus margins or erosion of the bony borders. Preoperative magnetic resonance imaging (MRI) examination also revealed a bony lesion in the sphenoid sinus (Figure-1A,B,C). There was no pathology in cerebral angiograms. The patient was operated via the transnasal endoscopic approach. The walls of the sphenoid sinus were thinned by tumour. Tumour tissue was observed as an ivory white and very hard mass lesion. It was not possible to remove the tumour using biopsy forceps and curettes. Subtotal decompression was achieved with a high-speed drill (Figure-2) and the specimen was sent for histopathological investigation. The postoperative period was uneventful and the patient was discharged on the postoperative third day. The lesion

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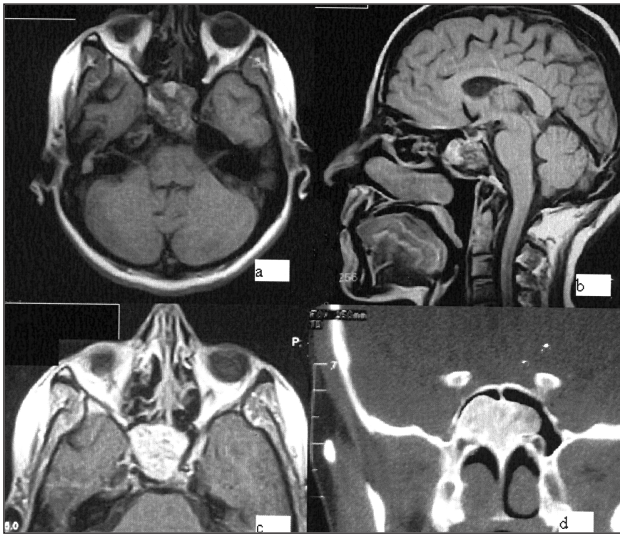


Figure 1: Preoperative axial (A) and sagittal (B) T1-weighted MRI scans display a large heterogeneous mass lesion in the sphenoid sinus region. Preoperative axial MRI view with IV-Gadolinium (C) shows that the mass lesion strongly enhances with contrast media. Preoperative coronal paranasal sinus tomography (D) shows a hyperdense mass filling mainly the right side of sphenoid sinus.

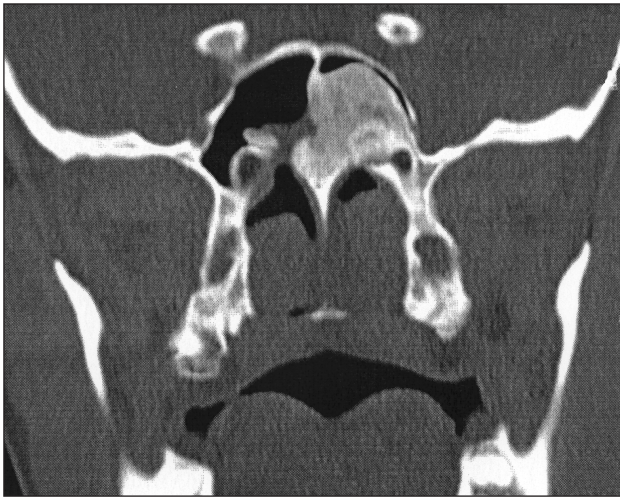


Figure 2: Postoperative coronal paranasal sinus tomography shows that the lesion was excised subtotally from the left side.

was diagnosed as osteoma by histopathological examination and was characterized by mature lamellar bone formation with prominent fibrosis in the intertrabecular spaces. New bone formation was evident at some areas. There were both ivory and cancellous parts (Figure-3) indicating this was a mixed-type osteoma.

DISCUSSION

Osteomas are common benign tumours of the paranasal sinuses. They are located mostly in the

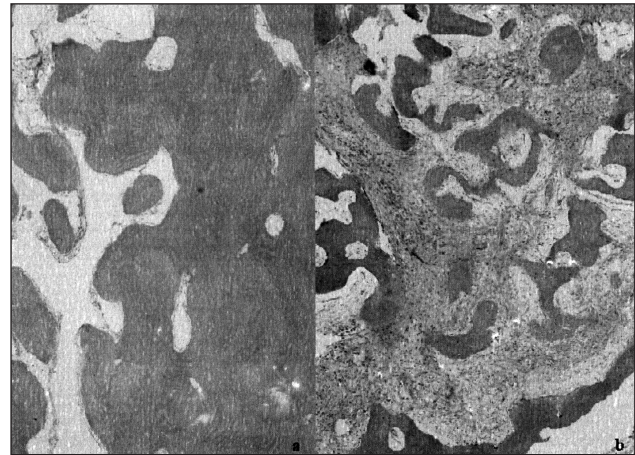


Figure 3: Histopathological examination of surgical material revealed compact mature lamellar bone (a) and cancellous morphology with fibrosis at the intertrabecular spaces (b). 400x HE

frontal sinus, and less commonly in the ethmoidal and maxillary sinuses. The sphenoid sinus is a rare location (14). The exact pathogenesis is still unknown. Current theories on the etiology of paranasal sinus osteomas are developmental, infectious and traumatic (27). Osteomas may be a part of Gardner's syndrome that is inherited as an autosomal dominant trait and characterized by intestinal polyposis, soft tissue tumours and osteomas (16). There is a slightly male dominance and tendency to occur in the 5th to 6th decades (6,14,19). They are histologically classified as ivory or cancellous. Ivory type lesions contain compact, usually lamellar bone, with scant or no intertrabecular spaces. In the cancellous type, the ratio of bone volume to intertrabecular space decreases and the morphology becomes similar to normal trabecular bone tissue. No significant practical differences are found between these forms of morphology when diagnostic techniques, treatment and prognosis are considered. CT is the method of choice for radiological diagnosis. It is able to show bony borders, erosions and soft tissue involvement as well. Osteomas are seen as well-circumscribed dense lesions in CT scans. However MRI is mostly useful in demonstrating complications (e.g. mucocele, pneumatocele) and in differential diagnosis. Fibrous dysplasia, ossifying fibromas, clival chordomas, cranial base meningiomas and other types of bone tumours must be considered in the differential diagnosis (13,17,28,29). Contrast enhancement in MRI is generally observed in fibrous dysplasia and could cause a difficulty in the

diagnosis of osteoma (3, 17). Durmaz et al. reported that bone scintigraphy is useful making a differential diagnosis between various bone tumors and that it could detect the lesions not visible in plain radiograms (5). The most common symptoms are facial pain, headache and nasal obstruction (1). If the lesions extend beyond the sinus margins, they cause complications such as cerebral abscess, CSF leak, mucocele, pneumatocele, meningitis and visual disturbance and may also rarely extend intradurally (9,10,11,15,20,22,25,27,29). Treatment of incidentally-found osteomas is still controversial. Smith proposed that asymptomatic and minimally symptomatic patients could be followed by serial radiograms but that surgery is indicated if the lesion fills the frontal sinus by more than 50% by volume (26). On the other hand, ethmoidal osteomas can cause symptoms earlier than those in frontal sinuses because of the small size of the ethmoidal sinuses. Osteomas that may pose a potential risk to the visual pathways have to be operated on urgently when diagnosed (20,22). Savic et al. advocated that surgery is indicated when extension beyond sinus margins or association with chronic sinusitis occurs and when they are localized near the frontonasal recess. They also proposed that ethmoidal sinus osteomas should be resected regardless of their size (23). Teed et al. proposed that osteomas should be resected when they are still small in size (27). For the past 20 years, minimally invasive surgery has gained popularity for paranasal sinus diseases. Frontal-ethmoidal sinus osteomas can be reached and resected easily by endoscopic techniques (1,2,10,19,20). It is possible to treat 71,4% of sphenoid sinus lesions safely by endoscopic approaches (24). The restraints of this approach are vital structures adjacent to the sphenoid sinus such as the optic nerve, cavernous sinus and carotid artery. Lesions located laterally in the sphenoid and frontal sinus are very hazardous. Neighbouring structure must be evaluated carefully with preoperative CT and MRI to avoid fatal injuries (12). However, if cranial base involvement or complicated lesions are present, open surgery should be considered (8,9,11,15,22,25,29).

In conclusion, osteomas are benign and slow growing tumours. Asymptomatic lesions in the sinus margins can be followed by serial radiograms but a biopsy should be performed if there is any suspicion about the nature of the tumour. Osteomas beyond the sinus margins or associated with

complications should be operated on. The operative technique has to be chosen according to the location and size of the tumours.

REFERENCES

1. Akmansu H, Eryılmaz A, Dağlı M, Korkmaz H: Endoscopic removal of paranasal osteoma: a case report. *J Oral Maxillofac Surg* 60: 230-232, 2002
2. Al-Sebeih K, Desrosiers M: Bifrontal endoscopic resection of frontal sinus osteoma. *Laryngoscope* 108 (2): 295-298, 1998
3. Chong VF, Khoo JB, Fan YF. Fibrous dysplasia involving the base of the skull. *AJR Am J Roentgenol.* 178(3):717-20., 2002
4. Dolan KD, Babin RN, Smoker WR: Case report 200 osteomas of the sphenoidal sinus. *Skeletal Radiol* 8: 233- 234, 1982
5. Durmaz R, Bozoğlu H, Kabukçuoğlu S, Tel E: Osteoblastoma of the cervical spine. *Histopathological and radiological correlation; Turk Neurosurg* 6; 88-92, 1996
6. Earwaker J: Paranasal sinus osteomas:a review of 46 cases. *22(6): 417-23, 1993*
7. Fradis M, Ben-David Y, Podoshin L: Mucocele of the sphenoid sinus due to an osteoma. *ENT:Ear, Nose&Throat Journal* 76(11): 824-26, 1997
8. Gezici AR, Okay O, Ergün R, Dağlıoğlu E: Rare intracranial manifestation of frontal osteomas. *Acta Neurochir* 146: 393-396, 2004
9. Hiroshi M, Kazuhiko T, Katsumi S, Atsushi O: Intradural extension of mucocele complicating frontethmoid sinus osteoma: case report *Surg Neurol*.50:453-6, 1998
10. Huang HM, Liu CM, Lin KN, Chen HT: Giant ethmoid osteoma with orbital extension, a nasoendoscopic approach using intranasal drill. *Laryngoscope*.111: 430-2, 2001
11. Johnson D, Leong T: Intraparenchymal tension pneumocele complicating frontal sinus osteoma:case report. *Neurosurgery*. 50 (4): 878-880, 2002
12. Kingdom TT, Delgaudio JM. Endoscopic approach to lesions of the sphenoid sinus, orbital apex, and clivus. *Am J Otolaryngol.* 24(5):317-22, 2003
13. Kiyoshi S, Keizo F, Masakatsu T, Seki Y: Benign fibrous lesions involving the skull base, paranasal sinuses, and nasal cavity. Report of two cases. *J Neurosurg*.88: 1116-9, 1998.
14. Koivunen P, Löppönen H: The growth rate of osteomas of the paranasal sinuses. *Clin.otolaryngol* 22: 111-114, 1997
15. Koyuncu M, Belet U, Sesen T, Tanyeri Y: Huge osteoma of the frontoethmoidal sinus with secondary brain abscess. *Auris Nasus Larynx* 27: 285-287, 2000
16. Lame EL: Rare osteomas of the paranasal sinuses. *NY State Med* 77: 2128-31,1997
17. Lawton MT, Heiserman JE, Coons SW, Ragsdale BD: Juvenile active ossifying fibroma. *J Neurosurg* 86: 279-285, 1997
18. Mikaleon DO, Lewis NY, Behringer HW: Primary osteoma of the sphenoid sinus. *Laryngoscope* 86: 728-33, 1976
19. Menezes CA, Davidson T: Endoscopic resection of a sphenothmoid osteoma: a case report *ENT: Ear, Nose&Throat Journal* 73(8): 598-601, 1994
20. Naraghi M, Kashfi A: Endonasal endoscopic resection of ethmoido-orbital osteoma compressing the optic nerve *Am J Otolaryngol* 24(6): 408-412, 2003

21. Nii Y, Mori S, Nakagawa H, Taki T: Osteoma of the sphenoid sinus. No Shinkei Geka 14(12): 1499-1503, 1986
22. Pompili A, Caroli F, Iandolo B, Mazzitelli MR: Giant osteoma of the sphenoid sinus reached by an extradural transbasal approach: case report. Neurosurgery 17(5): 818-821, 1985
23. Savic DLJ, Djerić DR: Indications for the surgical treatment of osteomas of the frontal and ethmoidal sinuses. Clin Otolaryngol 15: 397-404, 1990
24. Sethi DS. Isolated sphenoid lesions: diagnosis and management. Otolaryngol Head Neck Surg. 120(5): 730-6, 1999
25. Shady JA, Bland LI, Kazee AM, Marie A: Osteoma of the frontoethmoidal sinus with secondary brain abscess and intracranial mucocele: case report. Neurosurgery 34(5): 920-923, 1994.
26. Smith ME, Calcaterra TC: Frontal sinus osteoma. Ann Otol Rhinol Laryngol 98: 896-900, 1989
27. Summers LE, Mascot CR, Tompkins JR, Richardson DE: Frontal sinus osteoma associated with cerebral abscess formation: a case report. Surg Neurol 55: 235-239, 2001
28. Swain RE, Kingdom TT, DelGaudio JM, Mullers S: Meningiomas of the paranasal sinuses. Am j Rhinol 15(1): 27-30, 2001
29. Yoshikazu N, Toshiki Y, Makato O, Mayako T: A giant intracranial mucocele associated with an orbitoethmoidal osteoma . J Neurosurg 92(4): 697-701, 2000