

Intraosseous lipoma presenting as a sphenoid sinus mass

M. DOGAN¹, A.S. KAHRAMAN², C. FIRAT³, B. KAHRAMAN²,
E. KARATAS⁴, A. KIZILAY⁴

¹Department of Radiology, Inonu University School of Medicine, Malatya (Turkey)

²Department of Radiology Malatya Government Hospital, Malatya (Turkey)

³Department of Plastic And Reconstructive Surgery, Inonu University School of Medicine, Malatya (Turkey)

⁴Department of Otorhinolaryngology, Inonu University School of Medicine, Malatya (Turkey)

Abstract. – Intraosseous lipoma is an uncommon mesenchymal tumor that is frequently found in appendicular skeleton. In extremely rare conditions, it can appear in sphenoid bone, and only 2 cases have been described in literature until now. We present a case of lipoma in the body of the sphenoid bone mimicking sphenoid sinus tumor. A 16-year-old man presented to Department of Otorhinolaryngology with a complaint of nonspecific headache. There were any clinical findings on physical examination. Computed tomography (CT) and magnetic resonance imaging (MRI) revealed and the diagnosis was made on these imaging findings. Other diagnostic technique, invasive histopathological assessment was not necessary. To our knowledge, this is the first case of lipoma in the body of the sphenoid bone with indentation to sphenoid sinus. The patient has been followed-up radiologically without the need for surgery for two years.

Key Words:

Bone tumors, Intraosseous lipoma, Sphenoid bone, Mesenchymal tumors.

Introduction

Lipoma is a benign mesenchymal tumor that is frequently found in subcutaneous tissue but can be also rarely detected intraosseously. Appendicular skeleton is the most common location for the intraosseous lipomas (IOL)¹. The IOLs are usually asymptomatic that are discovered incidentally with radiological imaging techniques such as magnetic resonance imaging (MRI) and comput-

ed tomography (CT). The diagnosis is often made based on these imaging findings without the need for surgery and histopathological assessment². In this case report, we detected an expansive lipoma at the body of sphenoid bone which lead to indentation to sphenoid sinus and mimic sphenoid sinus mass. To our knowledge, this patient is the third patient detected IOL in body of the sphenoid bone reported in the literature until now^{3,4} and is the first among them that is mimicking sphenoid sinus mass.

Case Report

A 16-year-old man presented to the Department of Otorhinolaryngology with a complaint of nonspecific headache. There were no any other specific clinical findings on physical examination. MRI revealed a 28 × 22 × 13 mm mass at the left lateral portion of the sphenoid sinus. T1-weighted and T2-weighted MR images showed a homogeneous, well-defined, high-intensity mass. Fat suppressed T2-weighted images of the same lesion were homogeneous and hypointense, suggesting fat tissue content and the lesion was not enhanced after gadolinium administration (Figure 1). To define the mass better the physician requested high resolution CT, which revealed a well-defined expansive mass with low homogeneous density (around -70 Hounsfield Unit - HU), similar to adipose tissue, with location in the body of sphenoid bone indentating left lateral portion of the sphenoid sinus (Figure 2). The diagnosis of the lipoma was indicated with both MRI and CT findings, which were assessed together. The patient who was not seriously afflicted with headache was followed up radiologically without the need for surgery for two years.

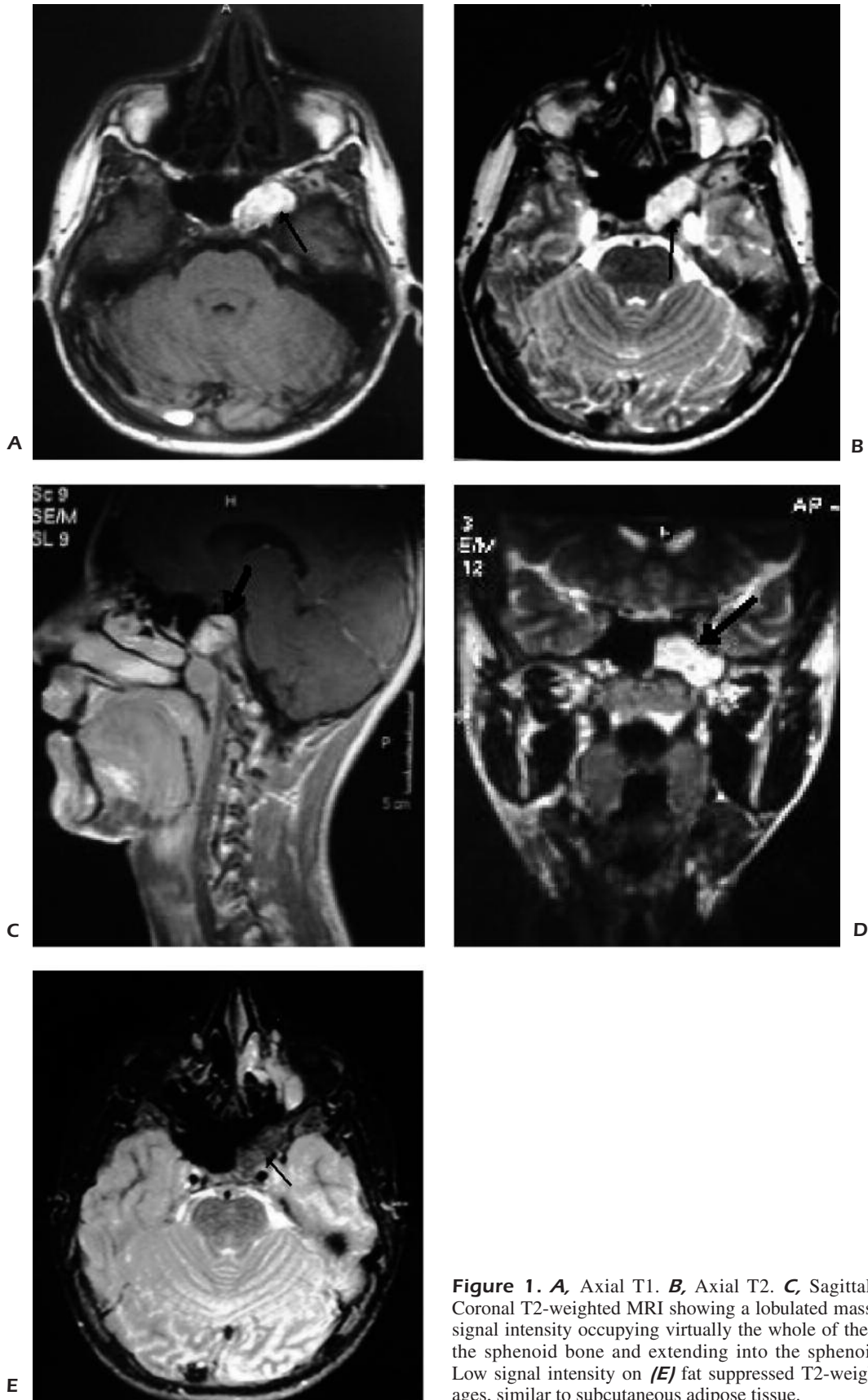


Figure 1. *A*, Axial T1. *B*, Axial T2. *C*, Sagittal T1. *D*, Coronal T2-weighted MRI showing a lobulated mass of high signal intensity occupying virtually the whole of the body of the sphenoid bone and extending into the sphenoid sinus. Low signal intensity on *(E)* fat suppressed T2-weighted images, similar to subcutaneous adipose tissue.



Figure 2. Axial CT scan showing a large mixed density lesion involving the body of the sphenoid bone extending into the sphenoid sinus. The hypodense areas had of very low density (-70 HU) consistent with adipose tissue.

Discussion

The intraosseous lipomas are typically caused by a proliferation of mature lipocytes within the marrow of normal trabecular bone. They are rarely encountered intraosseously that account for 0.08% of all primary bone tumors. These tumors are usually asymptomatic and often observed incidentally during routine CT and MRI studies⁵.

IOL has rarely been reported in different parts of the skull base⁶. Sphenoid bone body localizations are only declared in two case reports. These reported cases were determined either incidentally or because of symptoms caused by compression of the lesions to adjacent structures⁴. Lojanstik et al³ reported a case of IOL causing visual disturbance and vertigo. The other case⁴ extended to the intrasellar and supracellar cistern and compress the pituitary gland and was resulted as panhypopituitarism and visual loss. On the contrary, in our case, there was no particular sign and symptom other than nonspecific headache.

Milgram⁷ classified intraosseous lipomas histopathologically into 3 developmental stages: stage I, the lesion contains viable lipocytes; stage II, the lesion contains viable lipocytes which are also replaced by necrosis and calcification; and stage III, the lesion contains infarction, cyst for-

mation and dystrophic calcification. Histological components of these developmental stages currently affect T1 and T2 relaxation times and MR imaging is unique in its ability to explore intracellular content and recognize the presence of substances that may alter signal behavior. By MRI, viable lipocytes consisting in stage 1 lesions appeared as a high signal intensity on T1-weighted images and low signal intensity on fat suppressed T2-weighted images, similar to subcutaneous adipose tissue. MRI can demonstrate a thin rim of low-intensity signal at the margin of the lesion, consistent with reactive sclerosis in the surrounding bone. In stage 2 lesions, MRI can also show viable lipocytes and the peripheral rim of low signal intensity on T1- and T2-weighted images. In addition, it can also identify central calcification of the lesion that exhibit low signal intensity on T1- and T2-weighted images. The MRI appearance of stage 3 lesions is related to the different component of the lesion. Circumferential rim of adipose tissue shows a signal intensity behavior that is consistent with subcutaneous fat tissue. Central calcification and a thick rim of surrounding sclerosis indicate low signal intensity on T1- and T2-weighted images. Owing to their high water content, the infarction appears hyperintense on T2 weighted images, whereas the T1 signal intensities of that areas may be variable². In our patient, the MRI findings were consistent with stage I IOL.

Campbell et al² described 25 patients with IOL in which consistent features of the lesions included an average HU values between -40 to -60 at CT imaging. In our case, the density of the lesion was found at approximately -70 HU that supported adipose tissue.

Since most of the lipomas tend to spontaneous involution by means of fat necrosis, cyst formation and dystrophic calcification⁹, the conjunction of CT and MRI findings allow correct diagnosis of lesion as an IOL, without need to a pathological assessment⁸. Whereas IOL causing serious clinical symptoms are treated with surgical excision, an incidentally found one can be followed radiologically².

To the best of our knowledge here we report the first case of IOL in the body of the sphenoid bone that indentated to the sphenoid sinus which mimicked sphenoid sinus mass. We want to emphasize that radiological imaging modalities including CT and MRI are efficient in its diagnosis, without the need for other invasive diagnostic techniques.

References

- 1) KAZNER E, STOCHDORPH O, WENDE S, GRUMME T. Intracranial lipoma: diagnostic and therapeutic considerations. *J Neurosurg* 1980; 52: 234-232.
- 2) PROPECK T, BULLARD MA, LIN J, DOI K, MARTEL W. Radiologic-pathologic correlation of intraosseous lipomas. *AJR Am J Roentgenol* 2000; 175: 673-678.
- 3) LANISNIK B, DIDANOVIC V. Sphenoclival intraosseous lipoma. *Skull Base* 2007; 17: 211-214.
- 4) MACFARLANE MR, SOULE SS, HUNT PJ. Intraosseous lipoma of the body of the sphenoid bone. *J Clin Neurosci* 2005; 12: 105-110.
- 5) MILGRAM JW. Malignant transformation in bone lipomas. *Skeletal Radiol* 1990; 19: 347-352.
- 6) HAYASHI Y, KIMURA M, KINOSHITA A, HASEGAWA M, YAMASHITA J. Meningioma associated with intraosseous lipoma. *Clin Neurol Neurosurg* 2003; 105: 221-224.
- 7) MILGRAM JW. Intraosseous lipomas. A clinicopathologic study of 66 cases. *Clin Orthop Relat Res* 1988; 231: 277-302.
- 8) CAMPBELL RS, GRAINGER AJ, MANGHAM DC, BEGGS I, TEH J, DAVIES AM. Intraosseous lipoma: report of 35 new cases and a review of the literature. *Skeletal Radiol* 2003; 32: 209-222.
- 9) MILGRAM JW. Intraosseous lipomas: radiologic and pathologic manifestations. *Radiology* 1988; 167: 155-160.