

MRI AND CT OF BILATERAL INTRAOSSEOUS LIPOMAS OF THE SPHENOID BODY - A CASE REPORT

Mahnoor Hafeez, Ateeque Ahmed Khan

Department of Radiology, Dow Medical College/Civil Hospital (DUHS), Karachi, Pakistan.

PJR January - March 2017; 27(1): 52-55

ABSTRACT

We describe the case of a 12-years old male who was referred to the Civil Hospital in August 2016 with symptoms of generalized tonic clonic seizures. His MRI of the brain showed well defined bilateral lobulated hyperintense lesions occupying the body of the sphenoid bone. The lesion was hyperintense on T1- and T2-weighted sequences with central foci of hypointensity, without enhancement of the lesions after i.v. gadolinium injection. The CT scan revealed bilateral expansile osteolytic hypodense lesions involving the sphenoid body with central foci of calcification and the average Hounsfield Unit value of the lesions ranging from -85 to -90 HU confirming the fatty nature of the tumor. The radiologic features were consistent with intraosseous lipoma of the sphenoid bone, which is extremely rare. To best of our knowledge, we are reporting the first case of bilateral sphenoid intraosseous lipomas with characteristic MR and CT imaging features.

Key words: bilateral, Intraosseous lipoma, sphenoid body, CT, MR.

Introduction

Intraosseous lipoma (IOL) is a benign slowly growing primary tumor of the bone. It has a wide distribution and may occur in the appendicular as well as the axial skeleton.¹ Most often reported localizations include calcaneus, rib, and frontal and basal skull. Intraosseous lipoma is a very rare lesion, which constitutes not more than 0.1% of bone tumors.²⁻³ They are composed of mature adipocytes without admixed hematopoietic tissue or bony trabeculae. The IOLs are usually asymptomatic that are discovered incidentally with radiological imaging techniques. Lipoma is a tumor with characteristic CT and MR features.⁴⁻⁶ Intraosseous lipoma of the sphenoid bone is extremely rare.⁷ To best of our knowledge, only 14 cases of an UNILATERAL intra-osseous sphenoid lipoma have been reported in the literature; here, we are reporting the first case of BILATERAL sphenoid intraosseous lipomas with characteristic imaging features.

Case Presentation

12 years old male was referred to the Civil Hospital Karachi, with intermittent generalized tonic clonic seizures since the age of 8 years, not associated with fever. Patient has been treated with anti-epileptic drugs which have not reduced the frequency of seizures. There was no family history of seizures and physical examination including the neurologic exam, particularly the cranial nerve examination was unremarkable; except for mild pallor. No signs and symptoms of raised intracranial pressure were noted. His Cerebrospinal fluid (CSF) examination, hematologic exam including the biochemical tests was normal. Magnetic resonance imaging of the brain was performed on GE Health Care Signa HDxt 1.5 Tesla Scanner using the head coil with slice thickness of 4mm with interslice width of 1mm. Multiplanar, multisequential images in T1W, T2W fast spin echo sequence, FLAIR and post contrast T1W sequence were obtained. His MR scan showed (Fig. 1) well defined

Correspondence : Dr. Mahnoor Hafeez
Department of Radiology,
Dow Medical College/Civil Hospital (DUHS),
Karachi, Pakistan.
Email: mahnoor.hafeez@yahoo.com

Submitted 4 September 2016, Accepted 14 November 2016

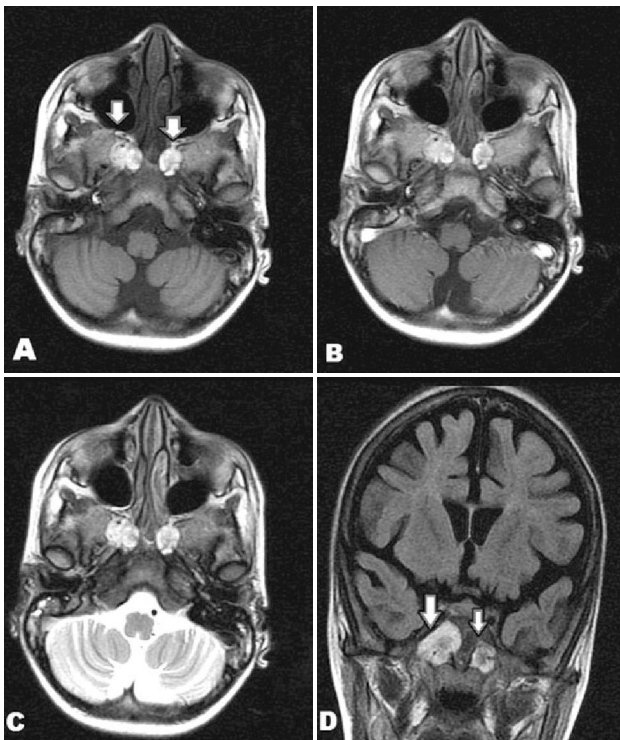


Figure 1: Axial T1- (A), -post contrast axial T1 weighted- (B), axial T2 weighted- (C) and FLAIR coronal (D) images demonstrate high T1, T2 and FLAIR signal (arrows in A & D) within the lobulated, well-defined intraosseous sphenoid body lesions. Some internal hypointense signal are also appreciated. The lesions show no enhancement in post contrast T1-weighted image (B).

lobulated intraosseous T1, T2, FLAIR hyperintense lesions at the skull base involving the body of sphenoid bone bilaterally, showing central hypointense focus on all above mentioned sequence. On the right side, it measures 2.0 x 1.8 x 1.8 cm and on the left side, it measures 1.3 x 1.4 x 1.2 cm in CCxTVxAP dimensions. No enhancement of the lesions was seen on post contrast sequence. Rest of the MR examination was unre-markable with no tumoral invasion or pressure effect over the temporal lobe, pituitary gland, sella, parasellar region or cavernous sinus, except for coexistent mild diffuse cerebral atrophy. The patient underwent plain brain CT of head (Fig. 2) performed with 16 slice Toshiba Spiral CT and flat-panel volume technique. The scanning parameters selected were 120 KV, 150 mA and 1 mm slice thickness. Images were viewed in bone and soft tissue window settings. It revealed bilateral expansile osteolytic hypodense lesions involving the body of the sphenoid with scalloped outline causing indentation over lateral walls of the sphenoid sinus, with partial effacement of right sphenoid sinus. There were central intralesional

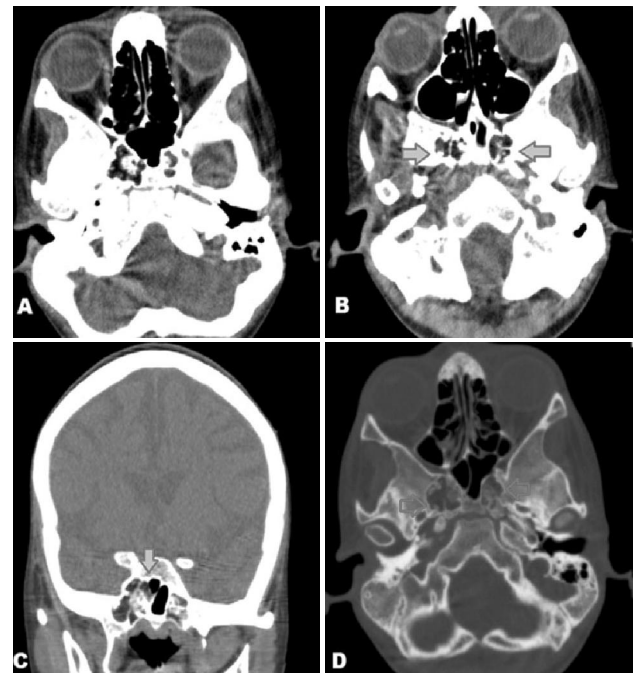


Figure 2: Axial CT contiguous axial sections in soft tissue window at skull base (Fig. A and B) depicts the fat attenuation of the sphenoid body lesions (arrows in B) with associated internal ossified trabecular septa. The coronal reformatted image shows partial effacement of the right sphenoid antrum (Fig. C arrow). The expansion of sphenoid body with thin sclerotic rim is shown on axial bone window (Fig. D).

ossified trabecular septa. The Region of interest (ROI) cursor placed over the hypodense part of the lesions on right and left side demonstrated the average Hounsfield Unit value of -90 and -85 respectively.

Discussion

Our patient was clinically diagnosed as a case of epilepsy; therefore MR Brain with epilepsy protocol was performed to identify the epileptogenic focus. Apart from mild diffuse cortical atrophy, suspicious non-enhancing T1- and T2- hyperintense intraosseous lesions on MRI with mean HU value of -85 to -90 and thin peripheral sclerotic rim on CT, were seen in sphenoid body at skull base, with no pressure effect over the adjacent brain parenchyma.

Boštjan et al⁸ in his case report for similar skull base lesion, initially proposed the differential diagnosis of chondroma, inflammation and intraosseous meningioma. Murphey et al⁴ stated that Intraosseous lipoma can be differentiated from other primary osseous lesions at CT imaging when it demonstrates the low

attenuation of fat (<-60 to -100 HU) and peripheral ossific rim or capsule that separates the lesion from the normal surrounding bone. Morteza Sanei et al⁹ also emphasized measuring the fat attenuation of the lesion in CT as a useful technique to improve the diagnostic accuracy of IOL.

The case series of Gaskin CM et al provided the evidence that MRI is 100% specific in the diagnosis of simple lipoma when no areas of enhancement is seen or the lesion demonstrates high T1 and T2 signal.¹⁰ Benign intraosseous lesions of the skull base are often identified in the course of routine radiological investigation.¹¹ Unfortunately, in our case, despite of enough counseling, the patients parents refused to give consent for surgical biopsy.

Bagatur AE et al in 2010¹² reported that computed tomography and magnetic resonance imaging findings of intraosseous lipoma are typical and surgery is not necessary in it. M.Dogan and his colleagues⁵ in 2011 emphasized that radiological imaging modalities including CT and MRI are efficient in its diagnosis, without the need for other invasive diagnostic techniques.

Milgram¹² divided the Intraosseous lipoma into three stages with variable CT and MRI appearances according to its involutonal stage. In stage I, solid lesions demonstrate viable fat and MR images demonstrate signal intensity of the lesion identical to that of subcutaneous fat. In stage, II transitional lesions contain regions of viable fat and fat necrosis, as well as areas of dystrophic calcification. The CT reveals fat attenuation lesion with central areas of increased density and MRI exhibits areas of fat intensity and central area of low T1- and T2- signal with thin peripheral sclerosis that exhibits a hypointense rim of on T1- and T2-weighted sequences. In stage III, there is extensive fat necrosis, cyst formation, calcification, and reactive new bone formation. CT and MRI shows thick peripheral rim of sclerosis, thick rim of fat is hypersignal on both T1- and T2-weighted sequences and central area of fat necrosis have variable and high signal on T1- and T2-weighted images.


Imaging findings in our patient is attributable to stage II pattern of Intraosseous lipoma. However, the relation of symptom of seizures to lipoma in our case seems to be coincidental, as no pressure effect over the brain parenchyma was seen on MRI. The incidentally found lipoma can be followed radiologically.

Conclusion

We report the first case of bilateral intraosseous lipomainvolving the body of sphenoid bone. Skull base lipoma is usually an incidental finding revealed during imaging for other symptoms, as depicted in this case and does not require any treatment. It is essential for the radiologist to become familiar with the CT and MR features of Intraosseous lipoma especially at rarer locations such as sphenoid bone to avoid more invasive diagnostic techniques, so as to reduce morbidity to the patient.

References

1. Öngürü Ö, Pabuçcu Y, Celasun B. Intraosseous lipoma of the fibula. *Clinical imaging*. 2002 Feb 28; **26(1)**: 55-7.
2. Jamrozik Z, Rosiak G, Kierdaszuk B, Milczarek K, Kaminska A, Dziewulska D, Krzeski A. Intraosseous lipoma of the sphenoid: a case study. *Case reports in neurological medicine*. 2013 May 28; 2013.
3. Murphey MD, Carroll JF, Flemming DJ, Pope TL, Gannon FH, Kransdorf MJ. From the Archives of the AFIP: Benign Musculoskeletal Lipomatous Lesions 1. *Radiographics*. 2004 Sep; **24(5)**: 1433-66.
4. Davies AM, Sundaram M, James SJ. *Imaging of bone tumors and tumor-like lesions: techniques and applications*. Springer Science & Business Media; 2009 Aug 21.
5. Dogan M, Kahraman AS, Firat C, Kahraman B, Karatas E, Kizilay A. Intraosseous lipoma presenting as a sphenoid sinus mass. *European review for medical and pharmacological sciences*. 2011 Nov 1; **15(11)**: 1339-42.
6. Palczewski P, Swiatkowski J, Golebiowski M, Blasinska-Przerwa K. Intraosseous lipomas: A report of six cases and a review of literature. *Polish Journal of Radiology*. 2011 Oct; **76(4)**: 52.

-
- 
7. Caranci F, Cirillo M, Piccolo D, Briganti G, Cicala D, Leone G, Briganti F. A rare case of intraosseous lipoma involving the sphenoclival region. *The neuroradiology journal*. 2012 Dec 1; **25(6)**: 680-3.
 8. Lanišnik B, Didanovic V. Sphenoclival intraosseus lipoma: case report and literature review. *Skull Base*. 2007 May; **17(03)**: 211-4.
 9. Taheri MS, Pourghorban R, Nassab MS, Pourghorban R. Sphenoclival intraosseous lipoma in skull base. *The open neuroimaging journal*. 2012; **6**: 99.
 10. Gaskin CM, Helms CA. Lipomas, lipoma variants, and well-differentiated liposarcomas (atypical lipomas): results of MRI evaluations of 126 consecutive fatty masses. *American Journal of Roentgenology*. 2004 Mar; **182(3)**: 733-9.
 11. Srubiski A, Csillag A, Timperley D, Kalish L, Qiu MR, Harvey RJ. Radiological features of the intraosseous lipoma of the sphenoid. *Otolaryngology-Head and Neck Surgery*. 2011 Apr 1; **144(4)**: 617-22.
 12. Bagatur AE, Yalcinkaya M, Dogan A, Gur S, Mumcuoglu E, Albayrak M. Surgery is not always necessary in intraosseous lipoma. *Orthopedics*. 2010 May 1; **33(5)**: 306.
 13. Milgram JW. Intraosseous lipomas: radiologic and pathologic manifestations. *Radiology*. 1988 Apr; **167(1)**: 155-60.