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

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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 Hounsfie ld 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 intraosseus 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 4 mm with interslice width of 1 mm. 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...
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 unremarkable 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 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 lesion 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 al¹⁰ in his case report for similar skull base lesion, initially proposed the differential diagnosis of chondroma, inflammation and intraosseous meningioma. Murphey et al⁰ 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 -100HU) and peripheral ossific rim or capsule that separates the lesion from the normal surrounding bone. Morreza Sanei et al 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 patient's 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 colleagues12 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 involutorial 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 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 lipoma involving 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 more morbidity to the patient.

References


