APPLIED RADIOLOGY
RADIOLOGICAL CASE

Sphenoclival Intraosseous Lipoma

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CASE SUMMARY

An 18-year-old presented with a history of chronic sinusitis and migraine headaches. Due to ongoing symptomatology, a CT sinus exam was ordered, which demonstrated findings consistent with acute sinusitis and a lytic lesion located in the anterior portion of the clivus. A subsequent MRI exam with and without contrast was recommended for further evaluation of the lytic lesion. Combined CT and MRI findings were consistent with an intraosseous lipoma.

IMAGING FINDINGS

A noncontrast CT sinus exam demonstrated the presence of small air-fluid levels within the sphenoid sinuses containing reticular densities/debris consistent with acute sinusitis. There was minimal mucoperiosteal thickening of bilateral maxillary sinuses. An expansile lytic lesion involving the anterior aspect of the clivus extending to the posterior wall of the sphenoid sinuses and containing septations with loss of cortex was identified to the right, measuring approximately 2.0 × 2.0 × 2.4-cm in anterior-posterior, transverse and craniocaudal dimensions, respectively (Figure 1).

MRI demonstrated a lobulated mass surrounding the sella turcica having signal characteristics of a sphenoclival intraosseous lipoma. MRI signal characteristics included: hyperintense signal on T1- and T2-weighted images, fat suppression, and no discernable contrast enhancement. In review of the prior CT exam, fat density within the lesion was demonstrated. There was normal parenchymal signal intensity (Figure 2).

DIAGNOSIS

Sphenoclival intraosseous lipoma

DISCUSSION

Intraosseous lipoma (IL) is a rare, benign, fat-containing tumor that can occur throughout the skeleton, most commonly in the lower limbs and specifically, in the calcaneus and femur. However, the incidence of an IL variant located intracranially is extremely rare.[1] There have been only five sphenoclival intraosseous lipoma cases published in literature. IL has no age predilection, affecting individuals between ages of 5 and 90.[2] IL occurs in the medullary cavity, which is the central part of bone where red and yellow (adipose tissue) bone marrow is stored. Due to its slow-growing, fat-containing, and benign characteristics, a sphenoclival IL is usually found incidentally on CT or MR scans.[2]

A study by Milgram investigated 61 patients with IL. After examination, a conclusion was made to divide the lipoma into three stages.[3] Stage 1 represents a solid fatty lesion of strictly viable fat. Stage 2 demonstrates a fatty lesion with necrosis or calcifications located centrally. Lastly, stage 3 represents advanced lipomas with characteristics of multiple regions of necrosis, cystic formations, and calcified fat material.[3] In stage 1, CT demonstrates a trabecular bone resorption with expansion, whereas T1- and T2-weighted MR imaging reveals signal intensity characteristic of adipose tissue. Furthermore, on CT imaging Stage 2 lesions will show attenuated fat that corresponds to obvious adipose tissue with calcification or necrosis. On MRI, T1- and T2-weighted imaging will show hypointense (calcified fat or ossification) presences of fat intensity; or may appear hyperintense densities (necrosis).[3] Lastly, in stage 3 with the addition of stage 2 findings will represent adipose calcified attenuation on CT. The presence of a circumferential lip of attenuated fat and calcification supports a diagnosis

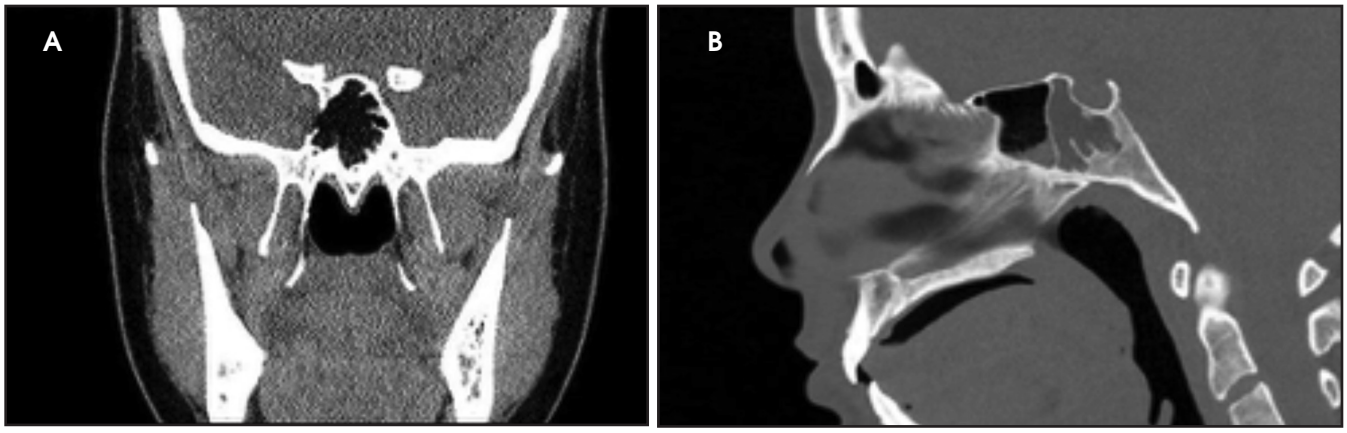

FIGURE 1. *Coronal (A) and sagittal (B) CT images demonstrate expansile lytic sphenoclival lesion containing fat.*

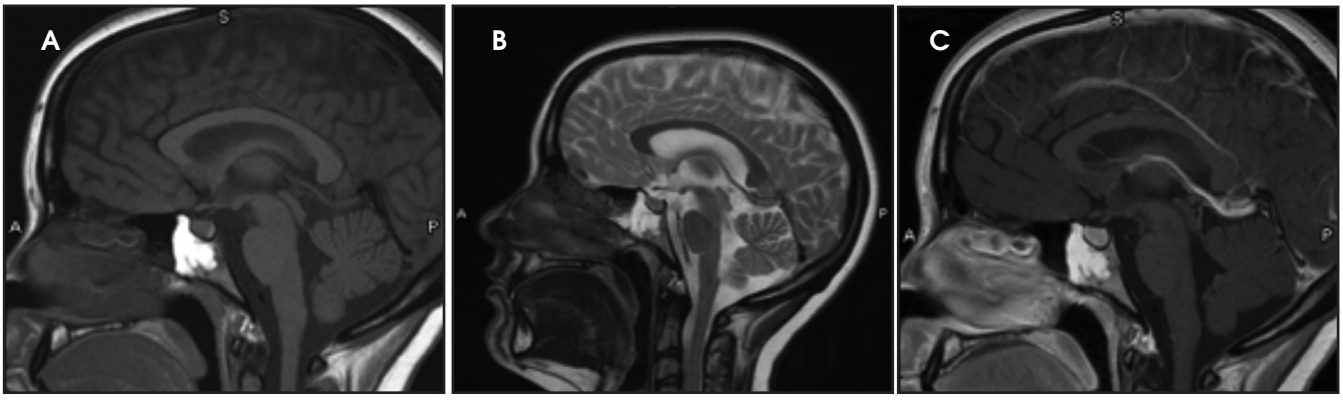

FIGURE 2. *MRI sagittal images on the sphenoclival lesion. (A) T1-hyperintense, (B) T2-hyperintense, and (C) T1 postcontrast images demonstrate enhancement.*

of an IL rather than bone infarction.[3] T2- weighted MRI will demonstrate a hyperintense signal that represents central necrosis and granulation tissue formation.[4]

Removal of an IL is rarely needed, as most are asymptomatic and an incidental finding. Treatment is usually conservative, with continued observation and scanning roughly every six to eight months. There are exceptions, however, when the IL is located intracranially. If an intracranial IL becomes symptomatic, surgical removal is warranted.[5] Currently, our patient did not require surgery as of this writing.

CONCLUSION

Intraosseous lipoma is a rare, benign, fat-containing tumor of the bone that occurs throughout the body, but most commonly in the lower limbs. In rare cases, these entities can be found intracranially, specifically within the sphenoclival region. Its characteristic features of fatty attenuation with or without calcifications or necrosis allows for certain diagnosis. Furthermore, a direct diagnosis can be made using T1 MR imaging with fat suppression. Surgical intervention is not required in the absence of symptoms.

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