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Head and Neck

Nontraumatic intradiploic arachnoid cyst of the sphenoid bone

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ABSTRACT

The intradiploic arachnoid cysts are rare radiological entities which are generally post-traumatic in nature and occur mostly in occipital region. We present a rare case of non-traumatic, asymptomatic intradiploic cyst of the greater wing of sphenoid in an elderly patient. The CT and MR imaging confirmed an intraosseous multiloculated cystic lesion which showed communication with the cerebrospinal fluid in anterior temporal fossa, through the small bony defects.

Introduction

Intracranial arachnoid cysts are benign cerebrospinal fluid (CSF)-containing cysts that are generally developmental in nature and are rarely post-traumatic or posthemorrhagic [1,2]. These cysts most commonly occur in the middle cranial fossa and can occasionally be symptomatic. Intradiploic arachnoid cyst is, however, a rare entity, can remain asymptomatic, and get diagnosed incidentally. The term "intradiploic arachnoid cyst" was first used by Weinand et al. in 1989 [3]. These intraosseous cysts are mostly post-traumatic in origin and very rarely non-traumatic in nature and are mostly documented in occipital regions [4–6]. Intradiploic arachnoid cysts may pose diagnostic challenge, and understanding the clinicopathologic correlation and imaging characteristic is crucial to avoid any misinterpretations.

Case report

A 77-year-old female patient had a head computed tomography (CT) examination for recent headache. There was clinical history of previously treated and cured gastric cancer 13 years ago and also history of melanoma in the past. However, no history of recent or previous trauma or any other neurologic symptoms were present. Clinical examination was unremarkable without any neurologic deficit. No previous neuroimaging was available in our records to compare.

The head CT (unenhanced and contrast enhanced) did not reveal any acute intracranial finding or any meningeal or parenchymal abnormality. The bony floor of the left middle cranial fossa, the greater wing of sphenoid bone, showed localized area of nonexpansile, multiloculated lesion of CSF attenuation with associated significant bony cortical thinning and small focal

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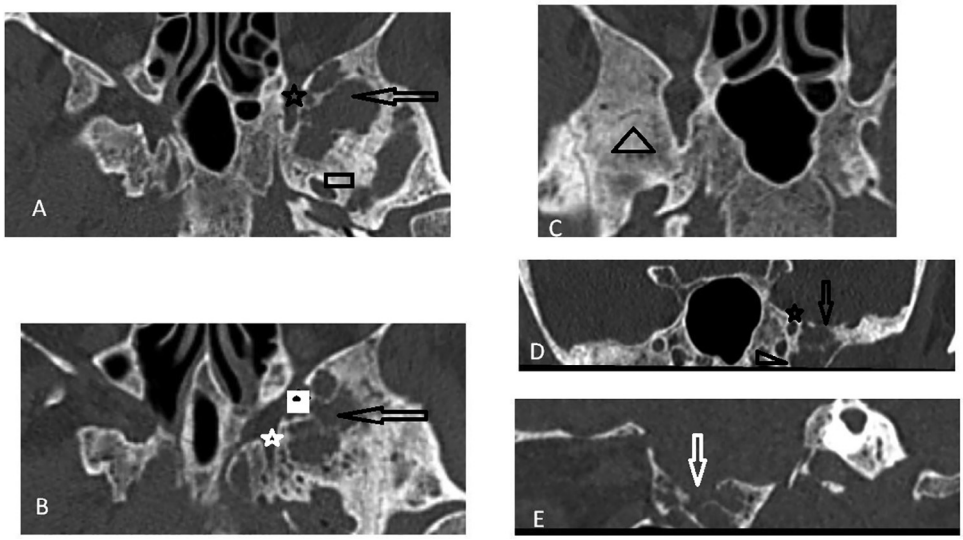

Fig. 1 – Computed tomography images. Axial images of the abnormal greater wing of the left sphenoid (A and B); axial image of the normal right sphenoid (C, triangle); and coronal (D) and sagittal images of the left sphenoid (E). These images show the lytic, multicystic lesion with focal cortical erosions at bony margins (arrows) on the left. Normal-looking foramen rotundum (star; A, B, and D), foramen ovale (rectangle, A), pterygopalatine fossa (white square, B), and vidian canal (side triangle, D).

bony defects (Fig. 1). There was no associated soft tissue component. This abnormality did not show any relationship or evidence of origin from adjacent structures of the skull base. The sphenoid sinus and orbits appeared normal with intact bony walls. The bony outlines of various foramina at mid skull base, including the sphenopalatine, the rotundum, the ovale, the spinosum, and the vidian canal, were intact (Fig. 1).

Subsequently, the patient had a contrast-enhanced head and neck magnetic resonance imaging (MRI) examination to assess the skull base in particular. The lesion was confirmed as a benign multicystic lesion in the greater wing of the sphenoid, which showed a CSF signal, marked low at T1-weighted imaging and high at T2-weighted imaging (Fig. 2), suppression of high signal at T2-fluid-attenuated inversion recovery

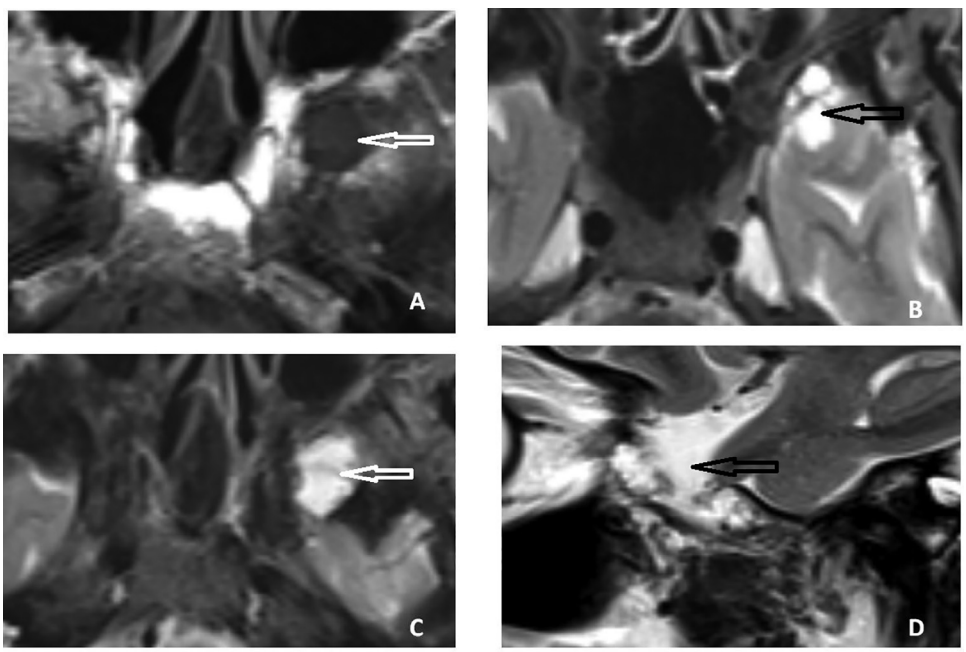

Fig. 2 – Magnetic resonance images. Axial T1-weighted (A), axial T2-weighted (B and C), and sagittal T2-weighted (D) images demonstrate the intradiploic simple multiloculated cystic lesion of the left greater wing of the sphenoid (arrows), communicating with the small intracranial arachnoid cyst.

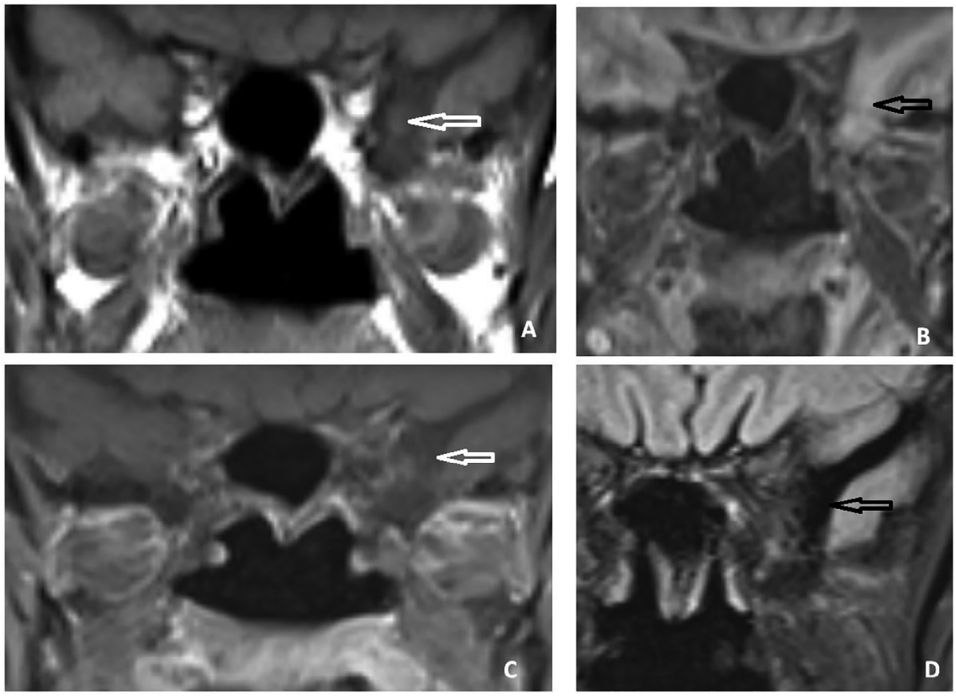

Fig. 3 – Magnetic resonance images of the skull base. Coronal T1-weighted (A) and coronal postcontrast fat saturation (C) confirm the lesion as nonenhancing (arrows). Coronal T2-fluid-attenuated inversion recovery (B) shows high signal and coronal fluid-attenuated inversion recovery (D) shows the suppression of T2 high signal (arrows) within the lesion.

sequence, and no evidence of contrast enhancement (Fig. 3). The diffusion-weighted image did not reveal any restriction. The feature of note was that this multicystic intradiploic lesion showed communication with subarachnoid spaces in the left anterior temporal fossa through the small defects at the bony floor of the middle cranial fossa (Fig. 2). The temporal subarachnoid CSF pocket was asymmetrically more prominent on the side of abnormality, and the appearance also suggests a possible small arachnoid cyst. The corresponding CT images confirm this finding (Fig. 1D and E). The adjacent soft tissue was normal without evidence of edema or abnormal contrast enhancement. Furthermore, MRI revealed that the cyst did not show any communication with the sphenoid sinus and any extension into the infratemporal fossa or the posterior skull base. The combined CT and magnetic resonance (MR) findings confirm this lesion to be an intradiploic arachnoid cyst of the sphenoid bone.

Discussion

The intraosseous bony cysts occur because of extension of arachnoid villi through the bony defects and are typically seen in post-traumatic cases and are likely associated with growing skull fractures [3,6]. This condition is also described in the literature as leptomeningeal cysts or post-traumatic arachnoid cyst or CSF fistula in cases of posttraumatic growing skull fractures [3,7,8]. However, the nontraumatic variety of intradiploic cyst is extremely rare and is seen mostly in the midoccipital region and less commonly in the temporal or the frontal skull base [3,5,7].

Occasionally, the intradiploic cysts may attain an enormous size and extend into the sphenoid sinus, orbits, infratemporal fossa, pterygomaxillary region, nasal cavity, and nasopharynx [1,2,6]. There are rare case reports in the literature that show different clinical manifestations and imaging findings of symptomatic intradiploic cysts. Large intracranial arachnoid cysts rarely extend into the sphenoid sinus, causing clinical manifestations of proptosis, headache, and nasal symptoms and imaging appearance of the sphenoid mucocele [1,2,8,9]. The smaller nontraumatic asymptomatic intraosseous arachnoid cysts do not require surgical management unlike the large or growing lesions with significant clinical implications [5,6,10].

In our case, there were no clinical features of cranial nerve palsies or symptoms related to orbit or paranasal sinus invasion. Imaging did not reveal any features of involvement of the sphenoid sinus, orbits, pterygopalatine fossa, posterior nasal spaces, or posterior skull base. The possible differential diagnosis of lytic lesions of the greater wing of the sphenoid includes mucocele or overpneumatized lateral recesses of the sphenoid sinus, intradiploic arachnoid cyst, epidermoid cyst, plasmacytoma, aneurysmal bone cyst, cystic fibrous dysplasia, or metastasis [6,8,11–13].

The imaging features in our case did not suggest any communication with the sphenoid sinus, which appeared normally pneumatized with intact bony walls. Our case appeared as a simple cystic mass of CSF density and did not demonstrate restriction of diffusion or high T1 signal on MRI to favor epidermoid or dermoid cyst, respectively. Similarly, MRI did not

show any heterogeneous appearance with fluid-fluid levels, which are diagnostic features of aneurysmal cyst. There were no associated diagnostic features such as expansion, ground-glass changes on CT, or corresponding MR features to suggest fibrous dysplasia. CT and MRI did not reveal any aggressive features, soft tissue thickening, abnormal contrast enhancement, or marrow edema on MRI to support any malignant pathology. Considering the appearance of a well-demarcated CSF density multicystic lesion with small defects at the inner cortex and the lack of any aggressive features, a diagnosis of intradiploic arachnoid cyst was made.

Conclusion

Nontraumatic intradiploic arachnoid cyst of the sphenoid bone is a benign rare condition. The smaller lesions can remain asymptomatic and can be diagnosed incidentally on imaging, but may pose diagnostic challenge. CT and MRI are complementary to confirm the CSF nature of the intraosseous abnormality, to document intradiploic arachnoid cyst's communication with the subarachnoid spaces, and to demonstrate the extent of bony involvement and differentiate it from other benign and malignant lesions involving the skull base.

REFERENCES

[1] Salimov A, Ozer S, Gocer C, Mocan B, Gunaydin RO, Yucel OT. Arachnoid cyst in the sphenoid sinus presented with headache and proptosis. Am J Med Case Rep 2013;11(2):256–8.
[2] Koutsimpelas D, Mueller-Forell W, Stoeter P, Hey O, Mann WJ. Arachnoid cyst with extraordinary extension in the skull base as a result of an iatrogenic defect of the middle cranial fossa floor: case report and literature review. J Cranio-Maxillo-Fac Surg 2010;38(4):284–7.
[3] Weinand ME, Rengachary SS, McGregor DH, Watanabe I. Intradiploic arachnoid cysts: report of two cases. J Neurosurg 1989;70(6):954–8.
[4] Martínez-Lage JF, Martínez-Pérez M, Domingo R, Poza M. Posttraumatic intradiploic arachnoid cyst of the posterior fossa. Childs Nerv Syst 1997;13(5):293–6.
[5] Açikgöz B, Tekkök IH. Post-traumatic intradiploic leptomeningeal fistula and cyst. J Clin Neurosci 2002;9(4):468–73.
[6] Sharma R, Gupta P, Mahajan M, Sharma P, Gupta A, Khurana A. Giant nontraumatic intradiploic cyst in a young male. Radiol Bras 2016;49(5):337–9.
[7] Granta F, Alafaci C, Passalalacqa Cacciola F, Caffo M, Salpietro FM, Vinci SL, et al. Non-traumatic sphenoidal intradiploic arachnoid cyst as a cause of trigeminal neuralgia, a case report. Neuroradiol J 2011;24(6):867–71.
[8] Saida H, Ishikawa E, Sakamoto N, Hara T, Terkado T, Masumoto T, et al. Intradiploic arachnoid cyst with meningothelial hyperplasia: a case report. NMC Case Rep J 2017;4(1):19–22.
[9] Kumar R, Chandra SP, Sharma BS. Giant intradiploic pseudomeningocele of occipital bone. case report. J Neurosurg Pediatr 2012;9(1):82–5.
[10] Hasegawa H, Bitoh S, Koshino K, Obashi J, Iwaisako K, Fukushima Y. Nontraumatic intradiploic arachnoid cysts—report of five cases. Neurol Med Chir (Tokyo) 1992;32(12):887–90.
[11] Osborn AG, Preece MT. Intracranial cysts: radiologic-pathologic correlation and imaging approach. Radiology 2006;239(3):650–64.
[12] Chen CY, Wong JS, Hsieh SC, Chu JS, Chan WP. Intracranial epidermoid cyst with haemorrhage: MR imaging findings. AJNR Am J Neuroradiol 2006;27(2):427–9.
[13] Fitzpatrick KA, Taljanovic MS, Speer D, Graham AR. Imaging findings of fibrous dysplasia with histopathologic and intraoperative correlation. AJR Am J Roentgenol 2004;182(6):1389–98.