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Original Research Article

Intradiploic Arachnoid Cyst of the Cranial Vault with Dural Defect: A Case Report

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Abstract

Intraosseous or intradiploic arachnoid cysts of the cranial vault are extremely rare lesions, representing herniations of the arachnoid membrane through a dural and inner table defect. A 35-year-old woman presented with progressive headaches and a slowly enlarging, non-tender left parietal swelling without any history of trauma. Imaging revealed a left parietal intraosseous cystic lesion with CSF-like signal intensity, thinning of the outer table, and communication with the subarachnoid space. Surgical exploration confirmed multiple small openings in the outer table with CSF outflow and an underlying dural defect. The cyst was excised, the dura repaired watertight, and the cranial vault reconstructed. The postoperative course was uneventful, and follow-up imaging at three months showed no recurrence. This case highlights an exceptional presentation of an intraosseous arachnoid cyst with dural communication. Recognition of this rare entity is essential for accurate diagnosis and proper surgical management.

Keywords: Intraosseous arachnoid cyst, intradiploic cyst, cranial vault.

INTRODUCTION

Arachnoid cysts are benign, cerebrospinal fluid (CSF)-filled lesions accounting for approximately 1% of all intracranial masses [1]. While most arise in the middle cranial fossa or posterior fossa, intraosseous or intradiploic arachnoid cysts of the cranial vault are exceptionally rare [2-3]. These cysts are thought to originate from herniation of the arachnoid membrane through a dural defect into the diploic space [4-5]. We report a unique case of an intraosseous arachnoid cyst of the parietal bone associated with a dural defect and direct CSF communication.

MATERIAL AND METHODS

Patient Information: A 35-year-old woman with no medical history presented with progressive headaches and a slowly enlarging swelling over the left parietal region. There was no history of trauma or infection.

Clinical Findings: On examination, a firm, non-tender, bony swelling was palpable over the left parietal area, with normal overlying skin and no neurological deficit.

Timeline for Current Episode: Headaches become more frequent, prompting brain imaging

Diagnostic Assessment: Cranial CT and MRI showed an intraosseous cystic lesion of the left parietal bone involving the diploic space, with thinning of the outer table and preservation of the inner table. The lesion exhibited CSF-like signal intensity and no enhancement after gadolinium injection, consistent with an intradiploic arachnoid cyst (Figure 1).

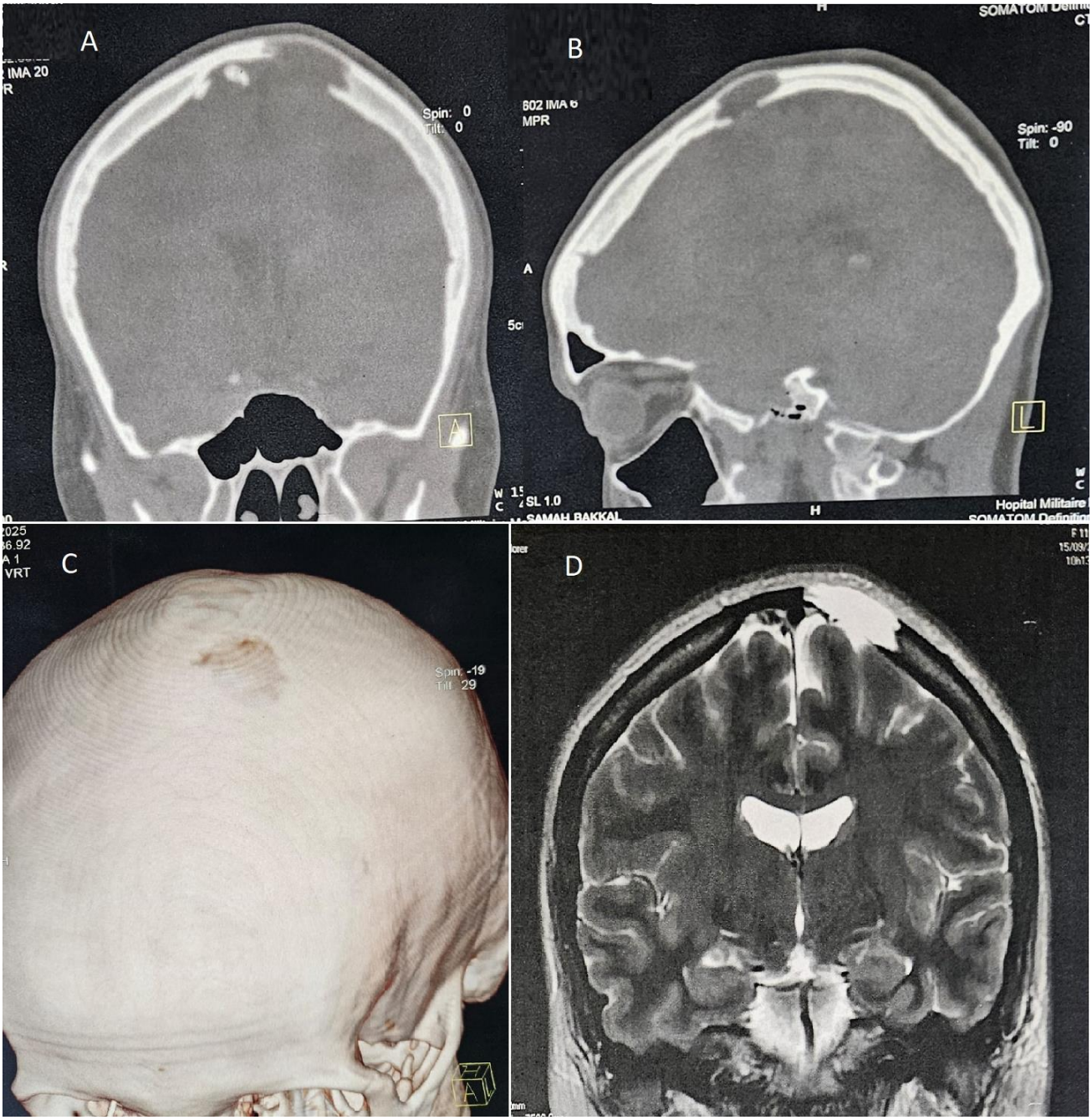

Figure 1: Initial CT scan (A). bone window coronal, (B). Sagital and (C). 3D reveal skull osteolytic lesion confined to inner table (D). Preoperative MRI showing an intraosseous cystic lesion of the left parietal bone with CSF-like signal intensity

Therapeutic Intervention and Outcome: Surgical exploration through a left parietal approach revealed thinning of the external table and multiple small openings with CSF outflow. A dural defect was identified beneath the bone, confirming communication between the cyst and the subarachnoid space (Figure 2). The cystic cavity was curetted, the dural defect repaired watertight with a dural substitute, and the bone defect reconstructed. Postoperatively, the patient recovered uneventfully, and follow-up imaging at three months showed no recurrence and good bone remodeling.

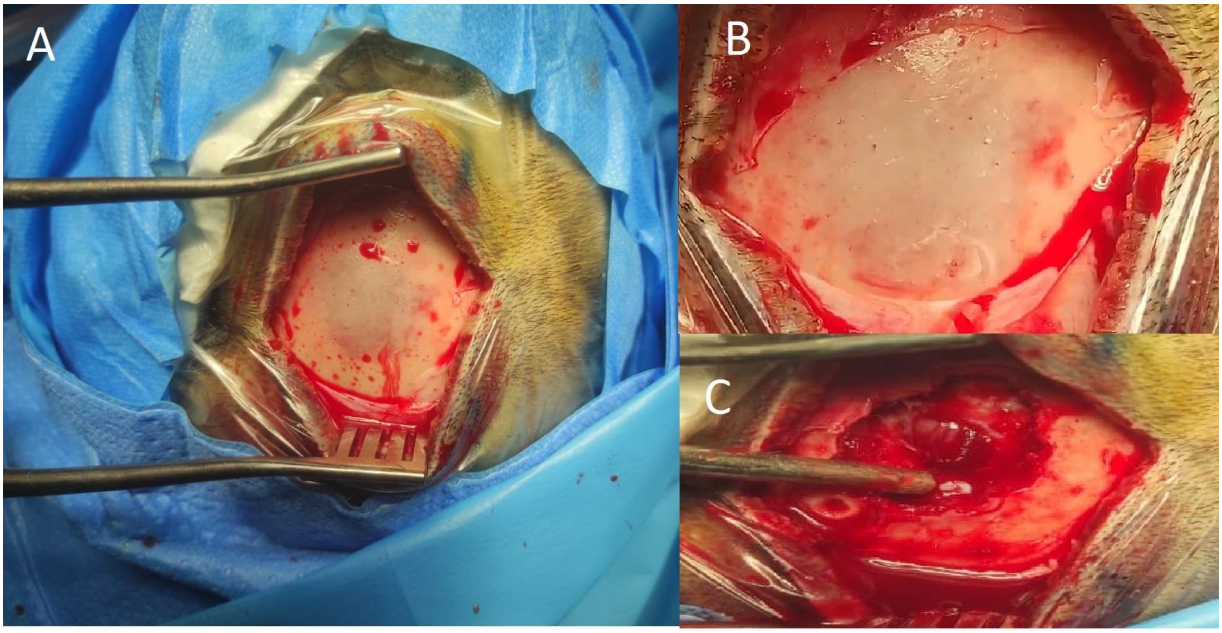

Figure 2: Intraoperative view showing thinning of the external table (A) with multiple small openings and cerebrospinal fluid (B) outflow through a dural defect (C) communicating with the subarachnoid space

Patient Perspective: The patient was satisfied with the management of her treatment.

Informed Consent: A written informed consent was obtained from the patient for publication of this case report, and a copy is available for review by the editor of this journal.

RESULTS AND DISCUSSION

Intraosseous arachnoid cysts are among the rarest types of arachnoid cysts, with few reported cases in the literature [6-7]. The prevailing theory suggests that they result from a congenital or acquired dural and inner table defect allowing arachnoid herniation into the diploic space [8]. Pulsatile CSF pressure gradually causes bone resorption and cyst enlargement. Most patients are young adults, and the parietal region is the most common site [3-6].

Radiologically, these cysts appear as well-defined osteolytic lesions with CSF-like signal intensity, no contrast enhancement, and no diffusion restriction [9]. They must be differentiated from epidermoid, dermoid [10], or neoplastic lesions [7]. Surgical treatment is indicated in symptomatic cases, aiming to excise the cyst, repair the dural defect, and reconstruct the bone [6-8]. In our case, the presence of a true dural defect and direct CSF communication is exceptionally rare [2-7] and underscores the importance of watertight dural closure to prevent recurrence. Prognosis is excellent after complete repair, and recurrence is uncommon when the dural continuity is restored [5-8]. Recent case reports have further characterized the spectrum of intradiploic arachnoid and related cystic lesion More recently. These reports highlight the overlapping radiological and pathological features of intradiploic arachnoid cysts and related lesions, and support surgical management with watertight dural repair as the treatment of choice.

CONCLUSION

Intraosseous arachnoid cysts of the cranial vault are exceedingly rare. They should be considered in the differential diagnosis of osteolytic skull lesions. Characteristic imaging findings and identification of a dural defect are essential for diagnosis. Surgical excision with dural repair and cranial reconstruction ensures an excellent outcome.

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