Case Report

Frontal Mixed Dermoid Tumor with Osteoma in an Infant: A Rare Case with Cranioplasty and Complete Recovery

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Conflict of Interest: None
Received: 01.01.2024
Accepted: 30.01.2024
www.banglajol.info/index.php/JSSMC

ABSTRACT:

We present a rare case of a 6-month-old female infant with a progressively enlarging, mildly painful swelling on the forehead over three months. Imaging studies revealed a mixed-density lesion extending externally through a frontal skull defect. The patient underwent surgical excision of the mass along with cranioplasty using titanium mesh. Histopathology confirmed a mixed dermoid tumor with an osteoma component. The patient achieved full neurological recovery postoperatively. This case underscores the importance of early imaging and timely surgical intervention in congenital cranial masses.

Key Words:
Dermoid tumor, osteoma, infant cranial swelling, cranioplasty, skull defect, case report

[J Shaheed Suhrawardy Med Coll 2024; 16(1): 64-66]
DOI: https://doi.org/10.3329/jssmc.v16i1.85268

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Background

Dermoid tumors are congenital inclusion cysts composed of ectodermal elements and are usually encountered during childhood. They frequently occur along embryonic fusion lines, particularly in the periorbital and nasal regions [1]. The occurrence of a mixed dermoid tumor with an osteoma component in the frontal bone is exceptionally rare, especially in infancy. Such lesions can expand over time, potentially causing cosmetic deformity, infection, or erosion of the skull [2,3]. Early diagnosis and surgical management are essential to prevent complications and ensure optimal functional and cosmetic outcomes [4].

Case Presentation

A 6-month-old female infant was brought to our neurosurgical clinic with a 3-month history of a progressively enlarging, mildly painful swelling over the forehead. The mass was non-tender, firm, and measured approximately 4 cm in diameter, located over the mid-frontal region [Fig-1]. There were no signs of fever, discharge, or neurological deficits.

Investigations

Non-contrast computed tomography (CT) revealed a well-defined, mixed-density lesion containing soft tissue and calcified components extending externally from frontal skull bone. CT characterized the lesion as heterogeneous, suggesting dermoid and osseous features without evidence of intracranial extension [Fig-2].

Treatment

The patient underwent surgical excision via a bicoronal

approach with frontal craniotomy. The mass was excised completely, and cranioplasty was performed using a custom-made titanium mesh [Fig-3,4]. Histopathology revealed a mixed dermoid cyst with mature bone trabeculae, confirming the presence of an osteomatous component [Fig-9,10].

Outcome and Follow-up

Postoperative recovery was uneventful, with no neurological deficits or wound complications. The cosmetic outcome was excellent [Fig-7,8]. The patient remained asymptomatic at six months of follow-up with no recurrence and normal developmental milestones [Fig-5,6].

Discussion

Dermoid cysts are benign congenital lesions arising from ectodermal elements, and they rarely present with osseous components such as osteoma [1]. In the pediatric population, the common sites are periorbital, nasal, and scalp regions [2]. The coexistence of dermoid and osteoma in the frontal region is an exceptionally rare occurrence, and to our knowledge, very few such cases have been documented in the literature [3,4].

The pathogenesis of combined dermoid and osteoma lesions remains speculative. It is suggested that chronic irritation or inclusion of mesenchymal components within the dermoid cyst wall may lead to osseous metaplasia [5].

Surgical excision is the treatment of choice. Complete excision with cranioplasty ensures both cosmetic and functional restoration [3,6]. In our case, we used a custom titanium mesh, which provided excellent reconstructive outcomes and minimized the risk of future complications.

This case emphasizes the importance of considering rare pathologies in the differential diagnosis of rapidly growing congenital scalp masses and supports the role of early imaging and timely surgical intervention to achieve favorable outcomes [4,6].

Conclusion

Frontal mixed dermoid tumor with osteoma in infants is exceedingly rare but should be considered in the differential diagnosis of midline cranial swellings. Prompt imaging, surgical excision, and appropriate reconstruction are crucial for optimal clinical and cosmetic outcomes.

Figure 1. Preoperative photo showing a large midline frontal swelling in a 6-month-old infant.

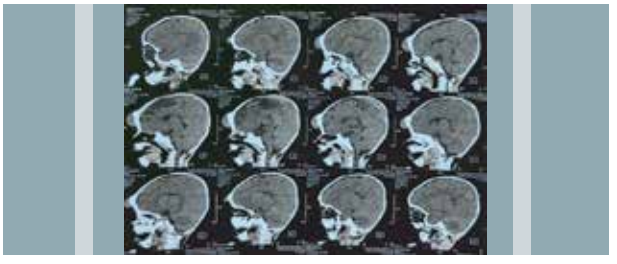

Figure 2. Sagittal CT images showing a well-circumscribed, mixed-density lesion with osseous features.

Figure 3. Frontal skull X-ray confirming the titanium mesh reconstruction.

Figure 4. Lateral skull X-ray after cranioplasty showing titanium mesh coverage.

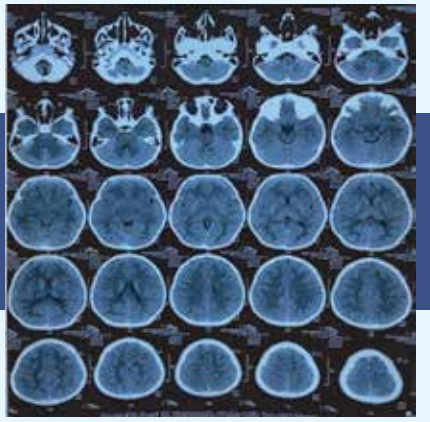

Figure 5. Post-op Axial CT scans showing well reconstruction of frontal skull bone.

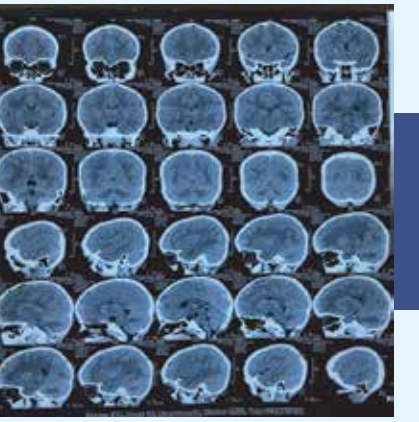

Figure 6. Post-op Coronal and sagittal CT slices illustrating well reconstruction & without recurrence of lesion.

Figure 7. Postoperative clinical photo showing excellent cosmetic outcome and no recurrence.

Figure 8. Closer view of the healed surgical scar on the frontal scalp, partially obscured by hair growth.

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Figure 9. Histopathology report showing diagnosis compatible with osteoma.

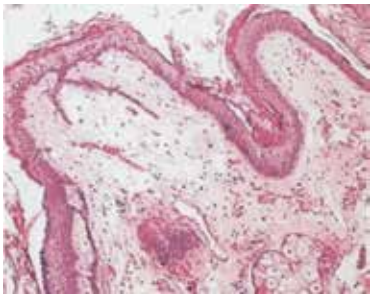

Figure 10. Histopathological slide image showing dermoid cyst with osteomatous elements.

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