Management of Epidermal Inclusion Cyst within a Diploic Space: A Case Report

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Introduction

Epidermoid cysts are benign lesions that can occur intracranially. Although observation is an option, a small percentage can become clinically symptomatic. While surgical excision is the standard of care, factors such as location, effect on cosmesis, and patient comorbidities can complicate management of these benign masses.

Case Presentation

A healthy 26-year old woman presented for evaluation of a left frontal bone mass. Imaging demonstrated a fluid-filled lesion of the left frontal bone, lateral to the frontal sinus. Erosion of the posterior cortex was noted. [Figure 1 & 2]

A bicoronal approach was used to expose the lesion for biopsy and resection. Once the left frontal bone was exposed, a Medtronic bone-anchored skull base array was used for image guidance. Intraoperatively, the lesion was noted to be dehiscent through the anterior and posterior cortices in three separate areas with exposed dura. [Figure 3] Frozen pathology demonstrated acellular, keratinous material with squamous lined epithelium, consistent with an epidermoid cyst. Once the lesion was completely excised, the surgical bed was filled posteriorly with Tisseel and Gelfoam and the anterior defect repaired using a 1-mm titanium plate. There were no post-operative complications or neurologic sequelae.

Background

- Epidermoid cysts, or epidermoid inclusion cysts, comprise 1% of intracranial tumors. Approximately 25% of these intracranial cysts can develop within intradiploic spaces[1-3], most commonly the frontal and parietal bones[2].
- They are thought to be derived from persistent ectodermal inclusions during neural tube closure.
- These are slow-growing lesions that commonly present as a painless mass with headache and focal neurologic symptoms depending on location[4,5]. Malignant transformation is rare[11,12].
- On MRI, these lesions are isointense on T1-weighted images and hyperintense on T2-weighted and flair sequences[4,10].

Approach	Indications/ Advantages	Contraindications/ Disadvantages
Endoscopic, Endonasal	• Small lesions at posterior wall of frontal sinus or infundibulum • Minimally invasive and good aesthetic results	• Lesions which are large, lateral to the medial wall of the orbit, or with intracranial extension
Supraciliary/brow	• Small tumors at anterior wall of frontal sinus • Patients who are bald or have small sinuses	• Poor aesthetic results • Females with high-arch brows • Higher recurrence rates[2]
Bicoronal	• Intradiploic lesions of calvarium • Large lesions with intracranial or lateral extension • Better exposure[15] • Less recurrence	• Alopecia/elevates hair line • Possible temporal hollowing • Longer operative time[16] • Prolonged hospital stay

Table 1. Approaches to the Frontal Bone

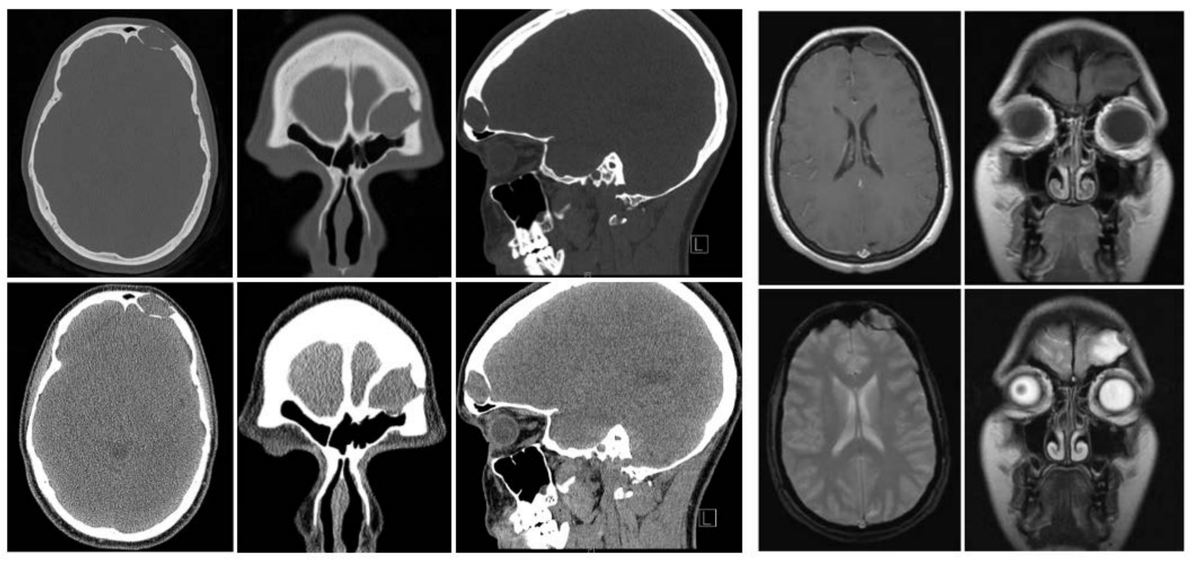

Figure 1. Left 2.2 x 2.5 x 1.7 cm intradiploic lesion of the frontal bone. Axial (left), coronal (middle), and sagittal (right) bone and soft tissue CT images.

Figure 2. Axial and coronal MRI images of the lesion which is isointense on T1 (top) and hyperintense on T2 (bottom).

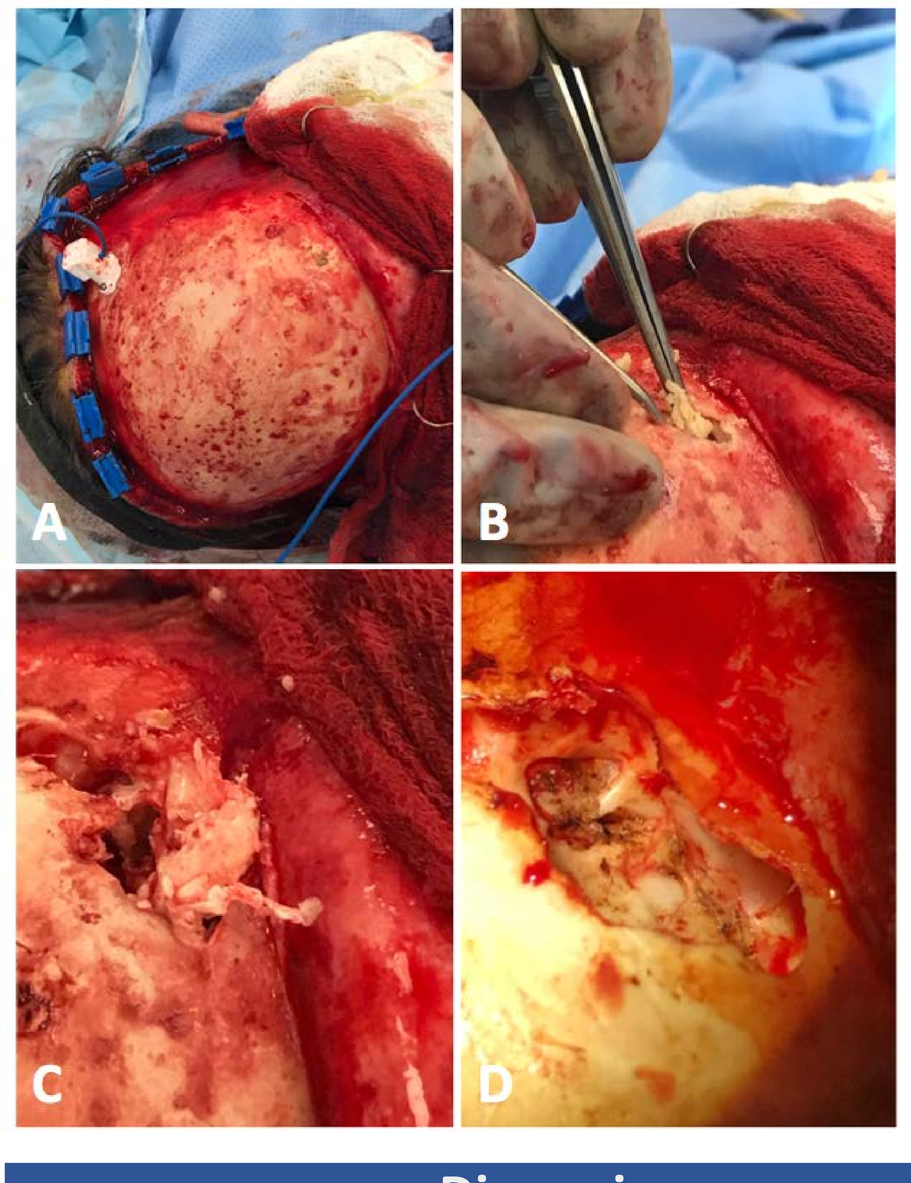

Figure 3. Intraoperative findings of left frontal bone mass. Lesion found to have eroded through the anterior cortex (A). Caseous contents and cyst lining were removed (B & C). Mass noted to erode through posterior cortex of frontal bone with areas of exposed, intact dura (D).

Discussion

This case demonstrates the complexity in the management of benign intraosseous lesions. It is important to assess the history of the present illness, related clinical symptoms, and characteristic appearance in imaging to help with diagnosis and management of intraosseous masses. Ultimately, a biopsy is required for virtually all intracranial lesions, even for the indolent subset. While there are multiple approaches for biopsy and resection of frontal bone masses [Table 1], patient factors should be considered when choosing the approach.

In our patient, a young female whose lesion was noted to be superolateral and isolated from the frontal sinus, the bicoronal approach offered the best exposure for biopsy and reconstruction. It is worth noting that other patient factors, such as age or existing comorbidities, may preclude an extensive surgical approach.

Conclusions

Epidermoid cysts, while benign, can be locally destructive and cause symptoms secondary to mass effect. In determining optimal management of these lesions, it is of the utmost importance to carefully review the history, imaging, and location. For our young female patient, a bicoronal approach with stereotactic navigation provided adequate exposure for biopsy and diagnosis, complete resection, and reconstruction.

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