

Frontal Sinus Epidermoid Tumors: Case Report & Literature Review



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Introduction

Epidermoid tumors and cysts in the frontal sinus are exceedingly rare, with few cases documented in the literature. These benign but locally aggressive neoplasms can pose significant diagnostic and therapeutic challenges due to their location and potential to cause substantial morbidity. Here we present the case of a 45-year-old woman with such a lesion and review the available literature on frontal sinus epidermoid tumors.

Case Presentation

A 45-year-old woman presented with a 10-year history of progressive left forehead expansion. Clinical evaluation and imaging studies revealed an expansile lesion of the frontal sinus that was non-enhancing with contrast and showed significant diffusion restriction. These findings were most consistent with an epidermoid tumor.

Literature Review

Epidermoid tumors and cysts, can be primary or secondary. Primary epidermoid tumors occur where two epidermal surfaces fuse together during embryogenesis and ectodermal tissue is sealed internally. Secondary epidermoid lesions can occur from traumatic or iatrogenic introduction of epidermal material into a closed body cavity. These lesions are slow growing, and, for epidermoid tumors of embryologic origin, symptoms may not occur until middle age. Epidermoid lesions of the frontal sinus should be included in the differential diagnosis of a patient with a painless, slowgrowing mass of the brow or orbit. While these lesions are benign, they are locally destructive, leading to erosion of the frontal bone, posterior table of the frontal sinus and orbit. Malignant transformation of these lesions has been described, however, the mechanism for such is unclear. To prevent recurrence, complete removal of the cyst lining is mandatory. Both endoscopic and open excision have been described, with open resection being the mainstay of therapy. In a review of the available English language literature, 15 cases, including the one presented here, have been reported.



CT Maxillofacial with and without contrast



T1 MRI with and Without Contrast



Case	Gender	Age	Treatment	Prior History
Spencer ¹	Male	40	Open hemicoronal incision	Cranial Trauma
Holt et al. ²	Female	24	Unilateral supraorbital incision	
Camanella et al. ³	Male	65	Brow incision with osteoplastic flap	
	Male	46	Brow incision with unilateral osteoplastic flap	
	Male	36	Open surgery (unclear approach)	Cranial Trauma
Hopp ⁴	Male	23	bicoronal osteoplastic	
Hansen et al. ⁵	Female	80	Lynch incision, followed by	
			bicoronal osteoplastic	
Hammami et al. ⁶	Male	25	Brow incision with unilateral	
			osteoplastic flap	
Lai et al. ⁷	Male	53	Draf 3 endoscopic resection	
Zoia et al. ⁸	Male	32	Endoscopic biopsy followed by	
			bicoronal osteoplastic flap	
Kuiren et al. ⁹	Female	27	Endoscopic Draf 3, followed by	
			osteoplastic flap	
Tejani et al. ¹⁰	Male	45	Endoscopic Subtotal Resection/Debulking	Cranial Trauma
Ahmed et al. ¹¹	Female	35	Endoscopic with trephination	Sinus surgery
Gonçalves	Female	68	Endoscopic biopsy followed by	
et al. ¹²			bicoronal osteoplastic flap	



Diffusion Weighted Images and T2 images

The patient underwent a left orbitofrontal approach via hemicoronal incision for resection of the epidermoid, including radical resection of the lesion, cranialization of the frontal sinus, and reconstruction of the left facial / forehead defect including supraorbital rim using pre-bent titanium mesh.







Discussion

Here we present a case report and a review of the available English language literature on the topic of frontal sinus dermoid tumors. We chose to exclude diploic dermoid cysts that have erupted into the frontal sinus; however, we acknowledge that there is likely significant overlap between these entities. We have also excluded cases of epidermoid cysts with associated malignancies, as the authors felt that these most likely represented a different pathogenesis than the case presented today.

The case presented today demonstrates both a typical history and radiologic findings classic for a frontal sinus dermoid cyst. In the available literature on this topic, many of the authors advocated delayed reconstruction due to the risk of recurrence of epidermoid tumors. We elected for primary reconstruction due to both the cosmetic and functional needs of our patient. Our patient, now almost a year out from surgery, is doing well without evidence of recurrence or complication. She will require annual surveillance MRIs for the foreseeable future.

Conclusions

Frontal sinus epidermoid tumors, although rare, should be considered in the differential diagnosis of expansile frontal sinus and orbital lesions. Early diagnosis and surgical intervention are crucial for optimal outcomes. Our case and the literature underscores the importance of initial diagnosis,

Operative Specimen, Post-op T1 and T2 Images

advanced imaging, and radical surgical resection.

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