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Case report

Transnasal frontal intersinus septum takedown for frontal sinus pyocele

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ABSTRACT

Introduction: The open frontal intersinus septum takedown (FISST) technique was first described in 1976. We describe our experience with an endoscopic transnasal approach to manage a frontal sinus pyocele arising from an obstructed frontal sinus outflow tract due to anterolateral thigh flap reconstruction of a maxillectomy defect.

Case report: A 40-year-old lady experienced upper eyelid swelling and purulent nasal discharge 3 weeks after undergoing a left extended medial maxillectomy with free anterolateral thigh flap reconstruction. A computed tomography (CT) scan revealed total opacification of the left frontal sinus. There was no improvement with intravenous antibiotics and she underwent a surgery, when she was found intraoperatively to have a frontal sinus pyocele, which was then drained. She then underwent an endoscopic transnasal FISST to ventilate the left frontal sinus via the contralateral frontal recess with good results. A CT scan performed 3 months postoperatively showed a widely patent interfrontal sinus septal window and right frontal outflow tract with no disease recurrence.

Discussion: The FISST is a useful technique to manage unilateral frontal sinus disease by taking advantage of the contralateral outflow tract when the ipsilateral frontal recess is obstructed.

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1. Introduction

Post-maxillectomy defects are associated with significant functional and aesthetic impact, and require reconstruction with prostheses or free flaps to minimize morbidity [1]. We present a case of a frontal pyocele arising from the use of an anterolateral thigh (ALT) flap for post-maxillectomy reconstruction, and the novel application of the endoscopic frontal interseptal sinus takedown (FISST) technique to treat it.

2. Case report

A 40-year-old lady presented with a basaloid squamous cell carcinoma of the left maxillary sinus extending up the nasolacrimal duct, and underwent resection of the tumour with an open extended medial maxillectomy, total ethmoidectomy and Draf 2a frontal sinusotomy. Frozen section specimens taken from the periorbita and orbital fat were negative. The defect was reconstructed with iliac crest bone for the medial and inferior orbital walls sup-

ported by a free ALT flap, which filled the rest of the maxillary cavity.

Three weeks postoperatively, she complained of left eye swelling and purulent nasal discharge, without diplopia or blurring of vision. The upper eyelid was edematous but there was no proptosis or limitation in extraocular movements. Visual acuity was normal. Nasoendoscopy revealed a trace amount of mucopus tracking round the ALT flap in the nasal cavity. A computed tomography (CT) scan demonstrated complete opacification of the left frontal sinus (Fig. 1). The patient was commenced on intravenous co-amoxiclav, but continued to remain symptomatic and orbital findings did not improve. At the same time, the final histology assessment revealed invasive carcinoma in the anterior orbital fat and periorbita. The patient was thus scheduled for an orbital exenteration and endoscopic sinus surgery.

Intraoperatively, the left frontal ostium was found to be obstructed by the ALT flap. Gentle exploration of the medial orbital wall revealed a sudden gush of pus. To avoid major disruption of the flap, an endoscopic FISST was performed. An uncinectomy, middle meatal antrostomy, total ethmoidectomy, and Draf 2a frontal sinusotomy was performed on the right. The interfrontal sinus septum was then removed endoscopically via the right frontoethmoidal recess to access the mucocele. The recess was packed with bioresorbable hyaluronic acid soaked in triamcinolone. The

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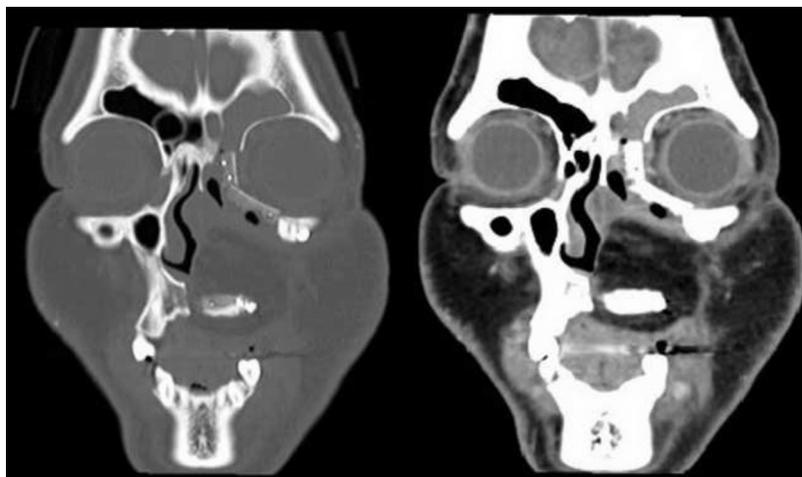


Fig. 1. Coronal computed tomography (CT) sections with bone window (left) and soft tissue window (right) demonstrating complete opacification of the left frontal sinus.



Fig. 2. Coronal computed tomography (CT) section showing resolved left frontal mucocele and patent frontal intersinus septum takedown (FISST) window.

orbital exenteration was completed, the iliac bone grafts removed, and the orbital cavity lined and filled with a pericranial flap. Post-operatively, the patient was started on sodium bicarbonate nasal irrigation.

At 3 weeks (Fig. 2) and 3 months (Fig. 3) post-endoscopic FISST, the right frontal recess and the interfrontal sinus window were widely patent, with no disease recurrence. While there were no further problems with the sinuses, the patient developed distant metastases from her basaloid squamous cell carcinoma and met her demise 6 months later.

3. Discussion

Our patient presented with symptoms suggestive of left frontal sinus dysfunction and the CT demonstrated complete opacification of the sinus without any obvious mass effect. The chief diagnosis at this point was frontal sinusitis, although early mucocele or pyocele remained differential diagnoses as the frontal recess had been instrumented and obstruction was a possibility. The diagnosis of pyocele was clinched when a sudden gush of pus was encountered intraoperatively, suggesting that a high-pressure collection of pus had been accumulating in the frontal sinus. The absence of other orbital signs could be due to it being early in the disease process.

The management of frontal sinus mucoceles or pyoceles generally involves surgery, with a recent shift from historic external open drainage procedures with an osteoplastic flap and sinus obliteration.

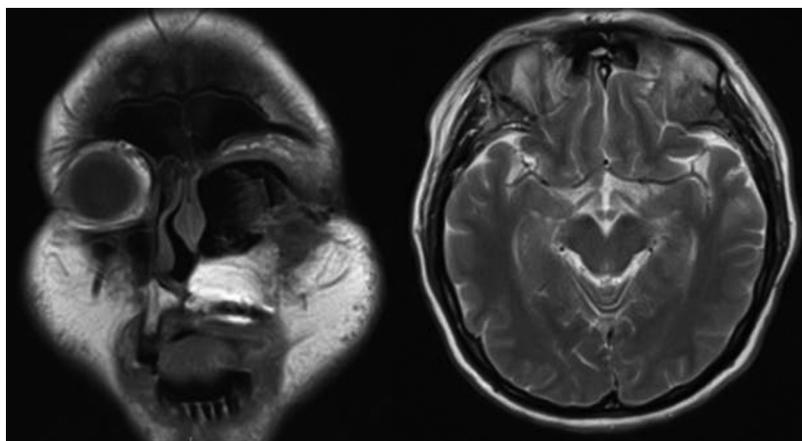


Fig. 3. MRI 3 months postop in coronal (left) and axial (right) sections demonstrating a clear left frontal sinus and patent interfrontal sinus septal window and frontal recesses.

tion, towards marsupialization via function-preserving endoscopic surgery [2].

A frontal pyo- or mucocele is ideally drained and reconnected to the ipsilateral frontal recess via a Draf 2a frontal sinusotomy [3]. If significant osteoneogenesis is present, a Draf 3 is preferred to a Draf 2b as restenosis of the neo-ostium is less likely [4]. However, in some instances, opening the ipsilateral frontal recess may not be surgically achievable, or maintenance of patency may be difficult. In these cases, the FISST can be considered.

The open FISST technique was first described by Pope and Thompson [5] in 1976, and utilized by Goode et al. [6] for unilateral frontal sinus obstruction. Subsequently, this has been performed with the aid of a frontal trephine [7,8]. In Reh et al.'s series [9], good results were obtained in 12 patients, one of whom had an endoscopic approach. More recently, Al Komser and Goldberg [10] described an extended Draf 2b across the frontal intersinus septum, proposing that this be termed a 'Draf 2c' procedure.

To the best of our knowledge, our report is the first in describing the use of a contralateral FISST procedure as part of the management of a frontal pyocele resulting from maxillectomy reconstruction, and is also the third reported case of a purely transnasal endoscopic FISST.

In our patient, although the pus had been drained after exploration of the medial orbital wall, recurrence of a mucocele was a concern as the frontal recess remained partially obstructed by the bulk of a free flap. The variable postoperative soft tissue changes in the recess can also lead to unpredictable delivery of intranasal steroids and irrigation. We were keen to preserve the free flap, which had otherwise been viable and functioning well. With FISST, topical sinonasal treatment could be concentrated on the frontal recess, which was uninvolved in the resection and reconstruction, encouraging ventilation of the affected frontal sinus.

We acknowledge, however, that our results are limited by the duration of follow up which was dictated by the natural history of her aggressive cancer.

4. Conclusion

Free flap reconstruction of sinonasal defects can lead to sinusitis and pyo- or mucocele formation. By taking advantage of the contralateral anatomy, FISST is a useful technique for restoring drainage and aeration to an obstructed frontal sinus when the patency of the ipsilateral frontal recess is tenuous.

Disclosure of interest

The authors declare that they have no competing interest.

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