A Tale of Two Etiologies: Uni-Narial, Endonasal Transfrontal Approach For Evacuation of Frontal Sinus Mucocele

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Abstract

- A frontal mucocele is the most common location of all the paranasal sinus mucoceles. Mucoceles can occur after surgery that violates the frontal sinus, traumatic fracture to the sinus, and sinonasal infection or inflammation.
- A vast majority of the patients with frontal mucocele are asymptomatic. Some patients may present with headache, facial pain supra orbital swelling and orbital cellulitis. The orbital invasion may lead to proptosis , diplopia and hypotropia.
- In this video report we present a case of in 71 years old male who underwent bicoronal craniotomy for resection of olfactory groove meningioma 18 years prior to presentation with the complaints of orbital pain, headaches and rhinorrhea. An MRI showed a heterogenous fluid collection within a remodeled frontal sinus. Cisternogram showed no direct communication with the CSF space.
- We performed left sided un-narial, endonasal transfrontal approach for evacuation of the sinus mucocele. A papilloma was identified medial to middle turbinate causing obstruction of the frontal sinus. This likely contributed to the development of mucocele in addition to the likley violation of the frontal sinus during her remote craniotomy.

Introduction

- Post-operative mucocele can result from violation of the frontal sinus during craniotomy.
- Obstruction of the frontal ostium may lead to mucus accumulation in the sinus, forming a mucocele.
- We present a case in which frontal mucocele arose from dual etiologies (surgical violation and ostium obstruction) and was treated via a uni-narial endonasal transfrontal approach.

Case Details

- 71-year-old female with a history of bifrontal craniotomy (18 years prior) for resection of an olfactory groove meningioma presented with orbital pain, headaches, and rhinorrhea (clear drainage) lasting several weeks. She had
  - Drainage predominantly left-sided; occasional bilateral nasal discharge.
  - Loss of sense of smell (anosmia).
  - Positive provocation test.

Imaging:

- CT scan revealed a remodeled left frontal sinus with a fluid collection.
- CT Cisternogram (unclear acronym) confirmed no communication between the fluid collection and CSF space.

Surgical Intervention:

- Left-sided uni-narial endonasal approach used for mucocele drainage. .
- Inverted papilloma identified in the nasofrontal recess (resected).
- Blockage caused by the papilloma likely contributed to mucocele development

Outcome:

- Patient discharged on postoperative day 1.
- Excellent recovery with no nasal drainage reported at 3-month follow-up
- Significant improvement in orbital pain.

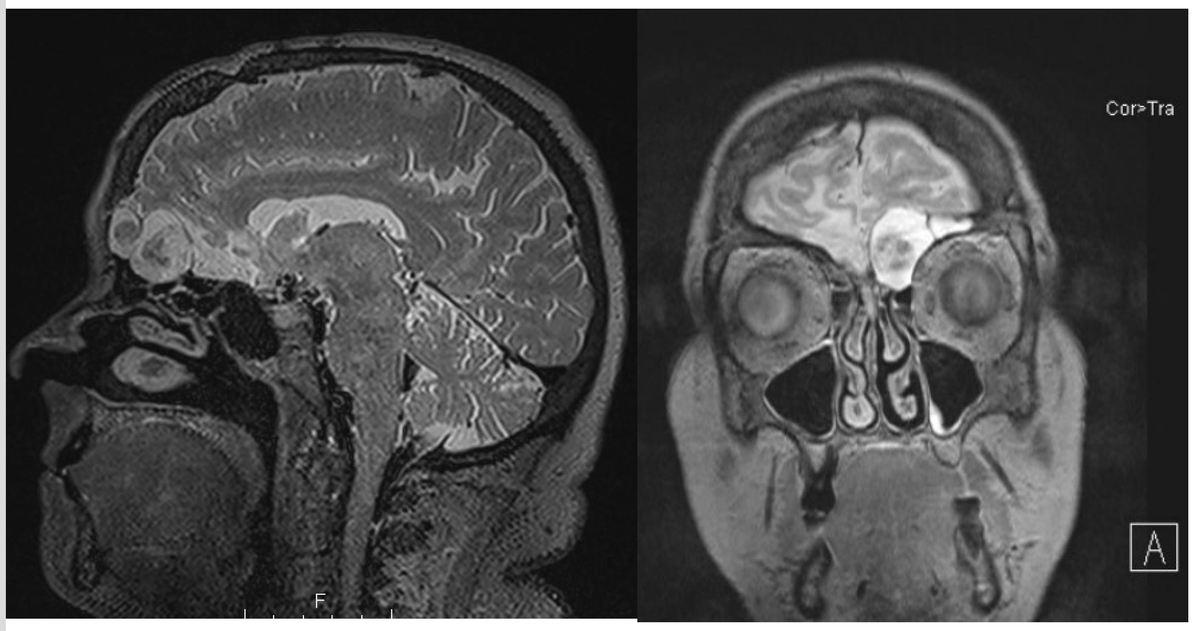

Figure 1. T2 sagittal and coronal MRI showing left sided frontal sinus fluid collection remodeling of the sinus walls

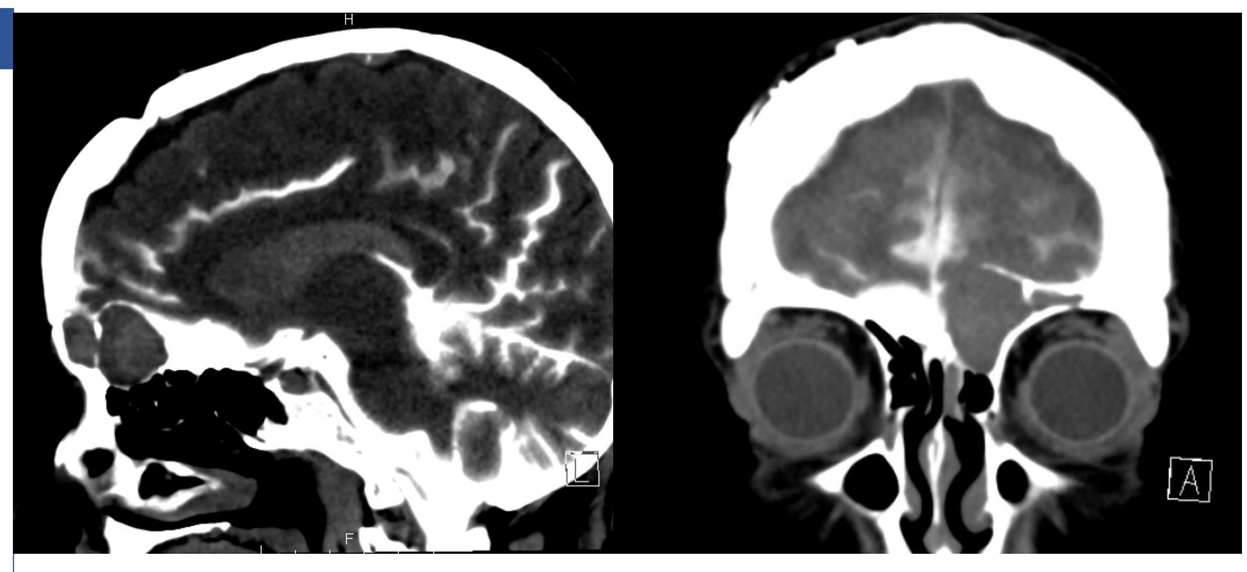

Figure 2. Cisternogram showing a lack of communication of the subarachnoid cistern with the mucocele cavity with With the remodeling of the bone.

Operative Details

- General Anesthesia
- Lumbar Drain followed by injection of 10 mg of intrathecal fluorescein (0.1 cc of a 10% fluorescein solution mixed with 10 cc of the patient's own CSF)
- The patient was positioned in Mayfield 3-point fixation - the head turned towards the right with extension to facilitate reaching the frontal sinus.
- The patient's face as well as abdomen and leg for possibility of fat or fascia reconstruction we proceed with the case.
- A left sided endonasal approach. A lesion was noted just medial to the most anterior aspect of the middle turbinate that was causing some obstruction of the frontal ostium (Fig 3A). The lesion removed and sent for pathology.
- No concern for CSF/fluorescein sodium
- We used drill to widen the natural ostium both anteriorly and laterally as well as superiorly.
- The frontal sinus was entered, watery and mucus contents were evacuated (Fig 3B).
- The posterior part of the sinus was opened which contained a larger portion of very obvious mucus which was sent for culture.
- No CSF or Fluoresceine noted on final inspection
- Complete evacuation of the contents confirmed
- The opening left patent to allow marsupialization and epithelialization of the tract.
- Lumbar drain removed at the end of the case.

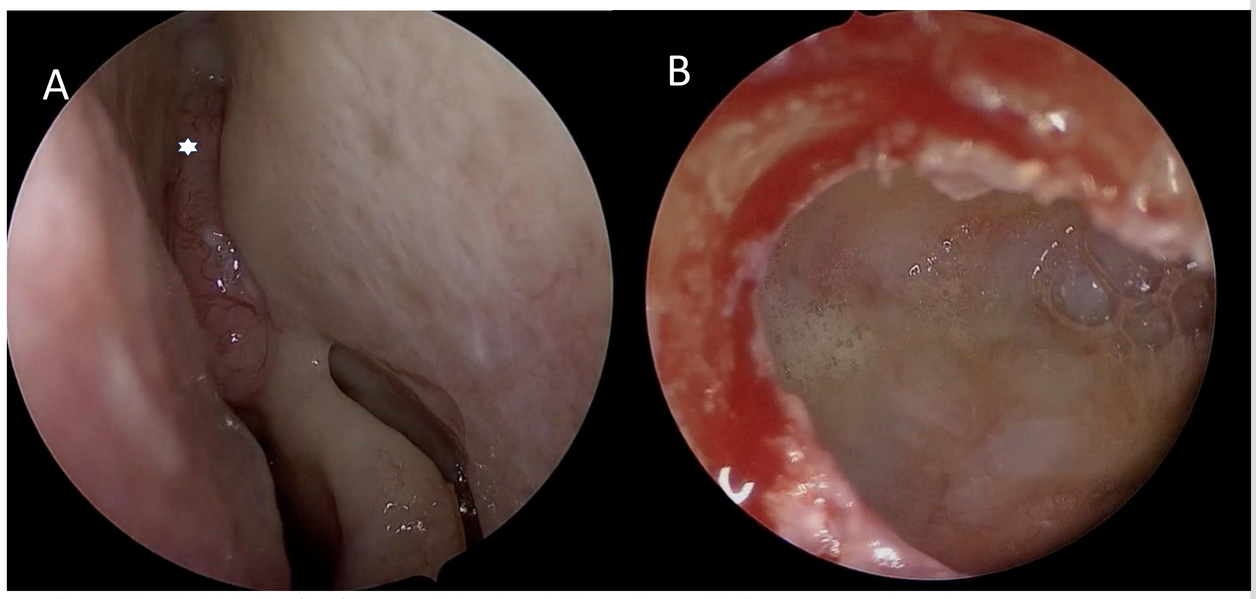

Figure 3A. Pinkish lesion (star) just medial to the middle turbinate. **3B.** Frontal mucocele cavity

Conclusions

Frontal mucocele is a rare complication resulting from the violation of the frontal sinus during craniotomy and may present several years after the index surgery. The presence of inverted papilloma may obstruct the frontal sinus ostium and promote the formation of mucocele.

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