

# Image Diagnosis: Frontoethmoidal Mucocele

Satvinder Singh Bakshi, MS, DNB<sup>1,2</sup>

Perm J 2019;23:18-288

E-pub: 06/24/2019

<https://doi.org/10.7812/TPP/18-288>

## CASE PRESENTATION

A 34-year-old woman presented with 2 months of right-sided congestion associated with 1 month of an external swelling on the right side of her nose. On examination, there was a firm swelling just above the right medial canthus (Figure 1). The computed tomography scan revealed a smooth, well-defined ovoid homogenous mass expanding and obliterating the ethmoid cells on the right side, with extension into the frontal sinus and orbit and lateral displacement of the globe (Figure 2). A diagnosis of right frontoethmoid mucocele was made. The mucocele was drained and marsupialized under endoscopic guidance, and a post-operative biopsy confirmed the diagnosis (Figure 3). The patient was asymptomatic at 5-month follow-up.



Figure 1. Patient with a smooth mass just above the right medial canthus.

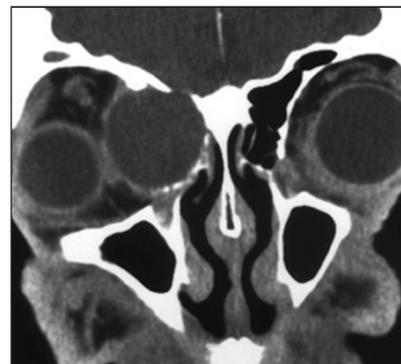


Figure 2. Computed tomography scan showing a smooth, homogenous, expansive mass eroding into the frontal sinus and orbit and displacing the globe laterally.

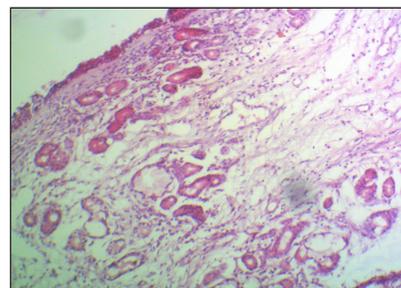


Figure 3. Respiratory tract epithelial lining with subepithelium showing edematous stroma and mucosal glands with mixed inflammatory infiltrates (hematoxylin and eosin stain, magnification =  $\times 40$ ).

## DISCUSSION

The term mucocele was introduced by Rollet in 1896.<sup>1</sup> It is an epithelial-lined cystic lesion of the paranasal sinuses, containing thick mucus and characterized by its slow growth and expansile nature.<sup>1</sup> Its etiology is unclear but may be secondary to obstruction of the affected sinus by chronic processes such as rhinosinusitis, nasal polyposis, previous surgery, or craniofacial trauma.<sup>1</sup>

Mucoceles occur most frequently in the frontal and ethmoid sinuses. However, the maxillary and sphenoid sinuses may also be involved.<sup>1,2</sup> They can occur at any age; however, the majority of mucoceles present in patients age 40 to 60 years.<sup>1,2</sup> Both sexes are equally affected. The clinical picture depends on the involved region and symptoms include facial pain, headache, nasal obstruction, diplopia, displacement of the ocular globe, and meningitis. The differential diagnosis includes malignant lesions, cholesterol granuloma, dermoid cyst, and fungal and tubercular granulomas.<sup>2</sup> The tendency for bony erosion is greater in the presence of infection. The direction of proptosis

helps in localizing the sinus involved. Lesions near the orbital apex push the globe forward, and lesions arising from the frontoethmoid complex push the eyeball forward, laterally, and downward.<sup>2</sup> Computed tomography scan is the investigation of choice, because it can assess intracranial and/or orbital extension and supports surgical planning. Magnetic resonance imaging scans are needed only when mucoceles extend intracranially, and to differentiate mucoceles from malignancy. Pathognomically, mucoceles tend to be fairly bright on T1-weighted images, compared with the brain, and isohyperintense on T2-weighted images.<sup>3</sup>

Treatment of mucoceles involves surgical excision or marsupialization, with or without obliteration of the sinus. The goal of treatment is to drain the mucocele and ventilate the involved sinus, with minimal morbidity and recurrences. The surgical approach is based on the size, location, and extent of the mucocele.<sup>2,3</sup> In the presence of infection, adjuvant

antibiotic treatment is indicated. Initially, surgery for mucoceles involved an external approach like Lynch-Howarth frontoethmoidectomy or osteoplastic flaps with sinus cavity obliteration. Today, endoscopic drainage is the recommended treatment for frontal mucoceles as it is minimally invasive, preserves

### Author Affiliations

<sup>1</sup> Department of Ear, Nose, and Throat; Mahatma Gandhi Medical College and Research Institute; Pillayarkuppam, Pondicherry, India

<sup>2</sup> Department of Ear, Nose, and Throat; Sri Balaji Vidyapeeth; Pondicherry, India

### Corresponding Author

Satvinder Singh Bakshi, MS, DNB ([saty.bakshi@gmail.com](mailto:saty.bakshi@gmail.com))

Keywords: epithelial-lined cystic lesion, frontoethmoid mucocele, mucoceles

sinus architecture, and, more importantly, leaves no facial scarring. The presence of any sinonasal involvement preventing drainage of the ostium, the origin of the mucocele in endoscopically inaccessible regions, and the presence of major fibrosis on the floor of the sinus are a few contraindications for an endoscopic endonasal approach. In such cases it is possible to use an external route (craniotomy) or a combined approach with external treatment under endoscopic guidance.<sup>3</sup> Recurrences are uncommon and usually occur within 4 years of surgery. ❖

---

**Disclosure Statement**

*The author(s) have no conflicts of interest to disclose.*

**How to Cite this Article**

Bakshi SS. Image diagnosis: Frontoethmoidal mucocele. Perm J 2019;23:18-288. DOI: <https://doi.org/10.7812/18-288>

---

**References**

1. Scangas GA, Gudis DA, Kennedy DW. The natural history and clinical characteristics of paranasal sinus mucoceles: A clinical review. Int Forum Allergy Rhinol 2013 Sep; 3(9):712-7. DOI: <https://doi.org/10.1002/alr.21178>.
2. Courson AM, Stankiewicz JA, Lal D. Contemporary management of frontal sinus mucoceles: A meta-analysis. Laryngoscope 2014 Feb; 124(2):378-86. DOI: <https://doi.org/10.1002/lary.24309>.
3. Stokken J, Wali E, Woodard T, Recinos PF, Sindwani R. Considerations in the management of giant frontal mucoceles with significant intracranial extension: A systematic review. Am J Rhinol Allergy 2016 Jul; 30(4):301-5. DOI: <https://doi.org/10.2500/ajra.2016.30.4323>.