

# Endoscopic Management of Frontal Mucocele Causing Orbital Displacement

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### Abstract

A mucocele of paranasal sinuses is a chronic cystic lesion that can either develop from obstruction of the sinus ostium by various pathologies, or from obstruction of the duct of a minor salivary gland located within the lining of the paranasal sinus. Endoscopic Sinus Surgery (ESS) is a minimally invasive technique that has limited implication in dealing with orbital complication. We are presenting a case of frontal mucocele, with secondary orbital displacement, which successfully treated with ESS.

**Keywords:** Orbital Displacement, Frontal mucocele, Endoscopic management.

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### Introduction

A mucocele of paranasal sinuses is a chronic cystic lesion which is lined with stratified, or low-columnar, epithelium containing occasional goblet cells.<sup>1</sup> They are usually filled with clear or yellowish thick mucoid secretions.<sup>2</sup> The contents are usually sterile unless they become acutely infected, then they are known as mucopyoceles.<sup>3</sup> Mucoceles can either develop from obstruction of the sinus ostium by congenital anomalies, allergy, infection, trauma, surgical intervention, neoplasms or polyps,<sup>2,4</sup> or from obstruction of the duct of a minor salivary gland located within the lining of the paranasal sinus.<sup>1</sup> Mucoceles can affect any paranasal sinus, with the frontal sinuses most commonly affected (65%).<sup>5</sup> There are no age or gender differences in the presentation of paranasal sinuses mucoceles.<sup>2</sup>

Endoscopic Sinus Surgery (ESS) is a minimally invasive technique that was introduced in the 1960s by Professors Messerklinger and Wigand.

It was popularised in Europe by Stammberger and in North America by Kennedy.<sup>6,7</sup> In comparison to conventional surgery, ESS permits a better view of the surgical field, a more precise and thorough clearance of inflammatory changes, fewer complications and lower recurrence rates of lesions treated.<sup>8</sup> The use of endoscopic surgery to deal with orbital complication is still under examination. We are presenting a case of frontal mucocele, with secondary orbital displacement, which successfully treated with ESS.

### Case Report

A 23-year old lady presented to our unit with a history of left frontal headache, nasal congestion (more in the left), anosmia, hyponasality, and progressive outward and downward displacement of the left eye with double vision. She was known to have reactive airway disease with allergy to NSAIDs. On examination, she was found to have marked exophthalmos and limited movement of the left eye in all directions.

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Nasal examination revealed bilateral nasal polyps with complete nasal obstruction. There was no lymphadenopathy. CT scans revealed left frontal mucocele eroding the roof of the orbit with compression of the left eyeball (Fig. 1). MRI scans showed enhancement of the mucocele fluid on T2-weighted images (Fig. 2). Under general anesthesia, she had ESS involving removal of the nasal polyps using the nasal shaver and widening of the frontal recess with marsupialization of the frontal mucocele. Anterior and posterior ethmoidectomy and bilateral sphenoidotomy were also done.



**Figure (1):** CT scan showing left frontal mucocele, arrow points to erosion of the roof of the orbit and compression to the globe.



**Figure (2):** A T2-weighted MRI showing the enhancement of the mucocele fluid (arrow).

The postoperative period was uneventful; she reported improvement few hours after the surgery and was very happy with the results. The patient was discharged on nasal douches, mometasone nasal spray and a 4-week course of anti-leukotrienes (montelukast 10mg once daily). She was reviewed 2 weeks later with marked improvement of her symptoms. No diplopia or nasal obstruction was found with some regaining of the sense of smell. Her left eye was in normal position with a full range of movement. Three months later, she was doing well with no complaints, she was asked to continue with the nasal mometasone spray. After 8 months, the patient had better olfactory function, mild postnasal drip, and no nasal obstruction. On examination, she did not have any exophthalmos (Fig. 3) and the endoscopic examination revealed thick nasal secretion on both nasal cavities but no polyps.



A



B

**Figure (3):** Postoperative photographs, there is no exophthalmus and the both globes are symmetrical, Photos were taken from above A, and front B.

Another CT scan was performed after 8 months (Fig. 4) that revealed pansinusitis, sparing the left frontal sinus. She was treated with oral antibiotics for 2 weeks and topical nasal mometasone. She was reviewed 3 weeks later with marked improvement and no complaints. Nasal endoscopic examination revealed a clean nasal cavity with no evidence of infection. The patient was advised to continue using nasal spray, and to appear for regular follow-up visits.



**Figure (4):** Post operative CT scan showing normal orbits and clear left frontal sinus.

## Discussion

Our patient had a frontal mucocele secondary to nasal polyposis. The mucocele has eroded the orbital roof and subsequently displaced the globe in an outward and downward direction. The patient treated endoscopically with complete improvement. This case illustrates that ESS can replace the more drastic open surgical approaches to treat benign frontal sinus lesions, and therefore, improvement in the patients' well-being.

Frontal sinuses are the most common sinuses to be affected with mucoceles.<sup>5</sup> These lesions can expand slowly over years and can erode into adjacent structures like intracranial cavity or orbits.

Mucoceles of the frontal sinus can be treated by endoscopic and non-endoscopic methods. Non-endoscopic treatment involves osteoplastic flap obliteration<sup>2</sup> but if the posterior wall of the frontal sinus is eroded and the dura is involved, a transcranial approach is performed with cranialization of the sinus and obliteration of nasofrontal duct.<sup>5</sup> Recently, Lai et al. suggest the transcaruncular approach may be best for the surgical correction of fronto-orbito-ethmoid mucoceles because of its potential for decreased risk of damaging orbital structures.<sup>9</sup> Endoscopic techniques including marsupialization and modified endoscopic Lothrop procedure have been used successfully to treat both frontal mucoceles and mucoceles of other paranasal sinuses. There is very little literature about the use of ESS for treatment of complicated mucoceles of the paranasal sinuses.

Because of the slow nature of progression with sinus mucoceles, long-term follow up is needed before endoscopic drainage of frontal mucoceles can be validated.<sup>10, 11</sup> Therefore, our patient will be under long-term follow up. It is possible that our patient developed her frontal mucocele as a result of previous sinus surgery. Previous sinus surgery has been reported to be a risk factor for the development of mucoceles that affect these sinuses.<sup>11, 12</sup> Patients presenting with NSAID intolerance or asthma are at risk for developing recurrences after endonasal surgery for nasal polyposis.<sup>13</sup> Therefore, it is very important that these patients have regular postoperative visits to detect early recurrence, especially in the Samter's triad patients.

Although there are no randomized controlled trials on the use of anti-leukotrienes for the treatment of rhinosinusitis, the efficacy of their use in the treatment of nasal polyposis has been demonstrated.<sup>14</sup> Furthermore, the use of anti-leukotrienes with topical corticosteroids has been found to delay the recurrence of nasal polyps after surgery.<sup>15</sup> For these reasons, we prescribed mometasone with montelukast to the patient.

## **Conclusion**

Endoscopic sinus surgery has gained popularity in treating uncomplicated mucoceles, but needs further trials to be adopted in complicated cases. We think that endoscopic approach can clear many complicated nasal diseases like this case effectively with marked reduction of morbidity and should be considered as the initial treatment.

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## علاج القيلة المخاطية الجبهية مع إزاحة المحجر بطريقة المنظار

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### الملخص

القيلة المخاطية في الجيوب الأنفية هي آفة كيسية مزمنة يمكن أن تتطور من انسداد في فتحة الجيب لعدة أسباب مرضية أو من انسداد في قناة غدة لعابية صغرى في بطانة الجيب الأنفي. جراحة الجيوب الأنفية بالمنظار هي تقنية قليلة التداخل لها نتائج محدودة في التعامل مع مضاعفات محجر العين. نحن نقدم حالة قيلة مخاطية جبهية مع إزاحة المحجر بشكل ثانوي عولجت بجراحة الجيوب الأنفية بالمنظار.

الكلمات الدالة: القيلة المخاطية الجبهية، إزاحة المحجر، طريقة المنظار.