

An ethmoid mucocele causing diplopia

A case report

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Abstract

Rationale: Mucocele is a disease lined primarily by epithelium, and occurs mainly when the sinus ostium is obstructed.

Patient concerns: We report a case of a 37-year-old man who presented with painless proptosis of the right eye and diplopia.

Diagnoses: The preoperative finding was mucocele of the ethmoid sinus.

Interventions: We performed endoscopic sinus surgery, which included uncapping of the anterior and superior wall of the mucocele.

Outcomes: The mucocele was treated safely and effectively without touching the medial orbital wall.

Lessons: Clinicians should note that minimally invasive surgery to remove ethmoid mucoceles is relatively straightforward and can prevent the various complications associated with these lesions.

Abbreviations: CT = computed tomography, MRI = magnetic resonance imaging, WI = weighted image.

Keywords: diplopia, endoscopy, mucocele, paranasal sinuses

1. Introduction

A mucocele is a benign lesion commonly encountered in the paranasal sinuses. It is caused by blockage of the outflow tract and the mucus not being able to escape. The most common site is the frontal sinus, followed by the ethmoid sinus.^[1]

Anatomically, the frontal and ethmoid region is close to the eyes and brain, and lesions here are prone to evoke complications of the eyeball or brain. Approximately 70% to 90% of sinonasal mucoceles occur at this site.^[1] Unlike other tumors, the surgical approach for a sinonasal mucocele does not seek to remove the entire lesion, and it is important that surgery is as effective as possible and without unnecessary risks. We report a 37-year-old man with an ethmoid mucocele causing diplopia and proptosis who was operated with only uncapping and without touching the crucial portions adjacent to the orbit or skull base.

This study was approved by the institutional review board of Chonbuk National University Hospital. Informed consent was given by the patient.

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2. Case report

A 37-year-old man presented with painless proptosis of the right eye present over the previous 2 months. He had a history of nasal trauma 7 years earlier. The patient was aware that a mass was visible on previous computed tomography (CT) scan, but he was not treated appropriately as the lesion was asymptomatic. His vision was normal, but extraocular muscle movement in the right eye was more restricted in the horizontal plane than in the left eye, especially in the medial direction (Fig. 1A). On CT scan, a 3.5 × 2.5 cm sized mass was visible in the right ethmoid sinus along the right orbit. The medial rectus muscle was compressed by a nasal cavity mass (Fig. 2). On magnetic resonance imaging (MRI), a 3.4 × 2.6 × 3.4 cm sized oval shaped mass in the ethmoid cavity showed a high signal intensity on T2-weighted images (WI) (Fig. 3A, B) and intermediate signal intensity on T1WI (Fig. 3C, D). The mass pushed the right lamina papyracea laterally, resulting in thinning of the right medial rectus muscle and medial orbital wall (Fig. 3). The patient underwent endoscopic sinus surgery. The operation started with uncinectomy, and the whitish bony shell of the mucocele was seen (Fig. 4A). After uncapping the anterior portion of the mucocele, yellowish thick mucus escaped from the mucocele cavity (Fig. 4B). We did not touch the epithelial lining of the medial orbital wall, which showed a Stankiewicz positive sign, which differed when the eye was pressed and not pressed (Fig. 4C, D). During 1-year follow-up, he has shown improvement of proptosis and eye movement compared with his initial presentation (Fig. 1B).

3. Discussion

A mucocele is a disease lined primarily by epithelium, and mainly occurs when the sinus ostium is obstructed. Inflammation, trauma, allergy, and congenital anomaly can be causes of mucocele.^[1] A recent retrospective report on inverted papilloma originating from the frontal sinus or recess showed that 37% of mucocele formation occurs after surgery to remove an inverted papilloma.^[2] The occurrence of mucocele in such a high



Figure 1. (A) The patient had diplopia when looking left. (B) His limited extraocular muscle movement had improved after the operation.



Figure 2. A CT scan showed a 3.5×2.5 cm sized ovoid mass on the right ethmoid sinus. The lateral wall of the mucocele was eroded; however, the medial wall was calcified. CT=computed tomography.

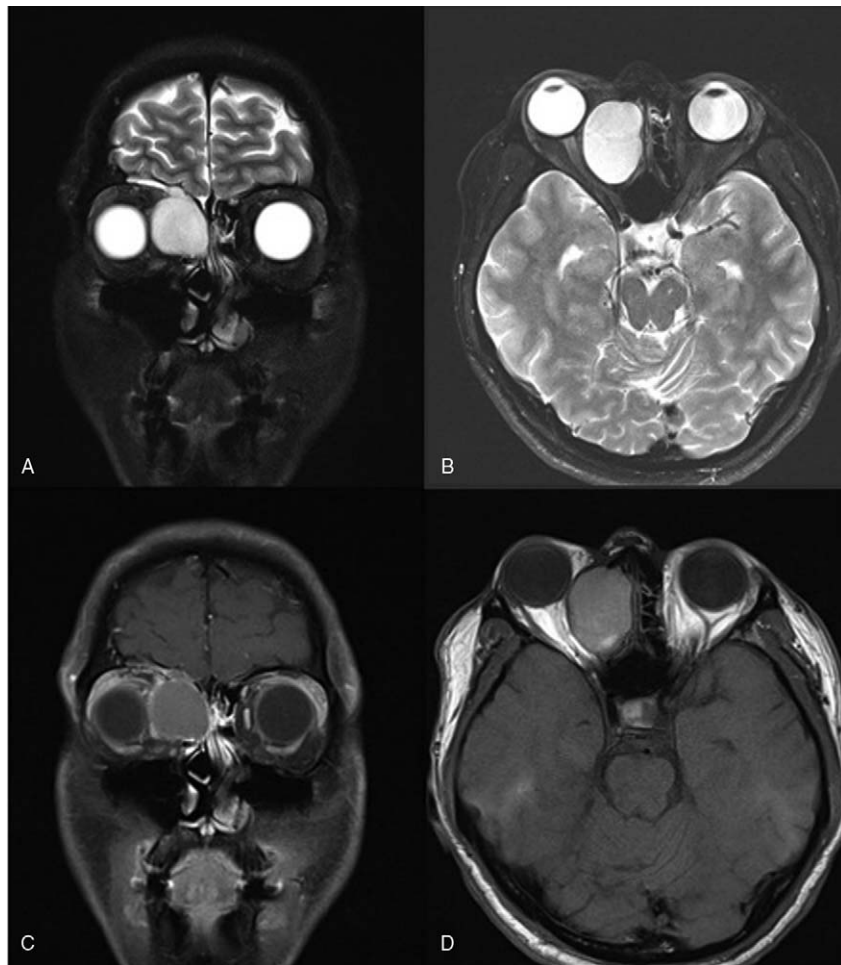


Figure 3. Magnetic resonance imaging (MRI) scan showed a $3.5 \times 2.5 \times 3.4$ cm sized oval-shaped mass on the right ethmoid sinus. MRI of the paranasal sinus demonstrated a hyperintense mass on T2-weighted images (A, coronal; B, axial) and intermediate signal intensity on T1-enhanced weighted images (C, coronal; D, axial). The mass was pushing the right medial orbital wall laterally, resulting in thinning of the right medial rectus muscle.

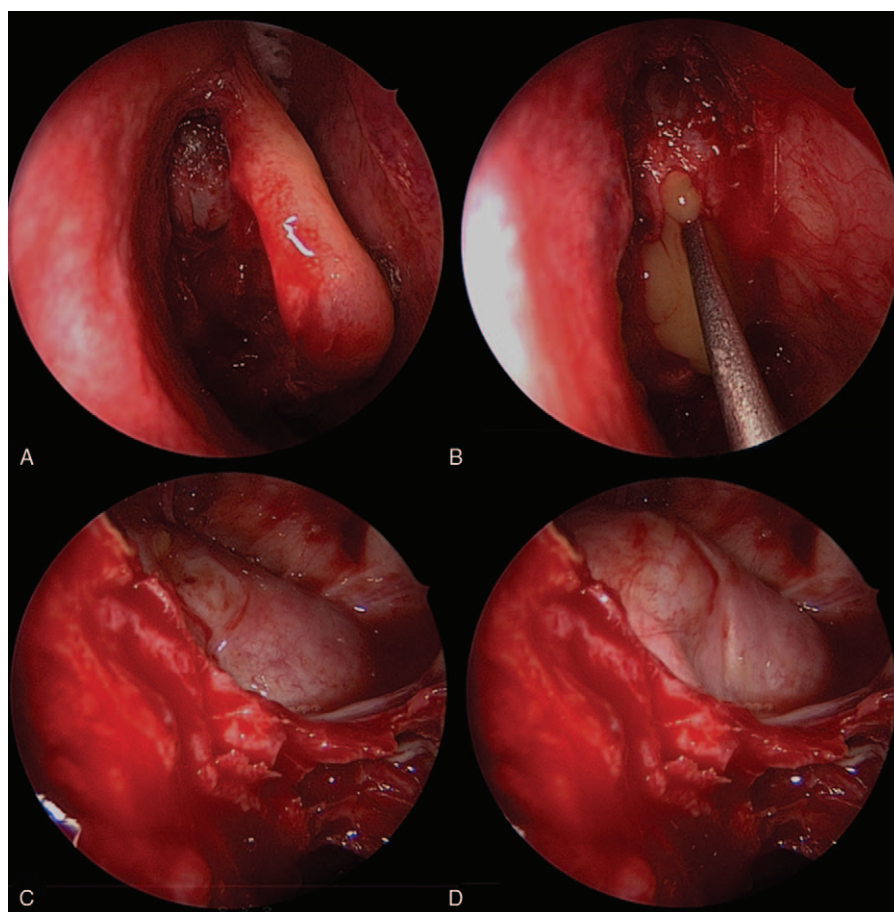


Figure 4. (A) The operation started with uncinectomy, and the whitish bony shell of the mucocoele was seen. (B) After uncapping the anterior portion of the mucocoele, yellowish thick mucus escaped from the mucocoele cavity. We did not touch the epithelial lining of the medial orbital wall, which showed a Stankiewicz positive sign, which differed when the eye was (C) not pressed and (D) pressed.

proportion is evidence that trauma such as drilling during surgery is a major cause of mucocoele formation. It is also reported that the average time it takes to develop a mucocoele is about 5 years.^[2] In our case, the patient had a history of nasal trauma about 7 years earlier, which is in accordance with previous literature. This is also the reason why long-term follow-up is necessary.

Paranasal sinus mucocoeles can induce headache, periorbital pain, and visual disturbance. Frontal and ethmoid sinus mucocoeles are usually present with ophthalmic symptoms such as proptosis and diplopia. Because paranasal sinus mucocoeles are located anatomically in proximity to the orbit, the lesion can compress the orbit resulting in raised intraocular pressure, diplopia, or proptosis.^[3]

Computed tomography is the most helpful tool to detect mucocoeles, and shows an airless and nonenhancing homogeneous mass. MRI can be used when mass discrimination using CT is difficult. In MRI, the mucocoele may have different signals at T1 and T2, depending on the degree of water inclusion and viscosity of the mucocoele.^[4] In our case, the medial wall of the orbit was eroded by the mucocoele as seen in the CT scan. In MRI, intermediate signal intensity in T1 and high intensity in T2-weighted images was seen.

The treatment of mucocoeles is based on surgery to excise the mass. In the case of visual problems, urgent operation is essential.^[5] Recently, the endoscopic approach has become preferred over the external approach because of minimal mucosal

injury, short recovery time, and low recurrence rate.^[6] Importantly, there is no need to completely remove the entire mucocoele mucosa. Mucosa or calcified walls not adjacent to the orbit or skull base may be removed, but care must be taken when removing mucocoele walls adjacent to the orbit or skull base. During the operation, manual palpation of the orbit is a very simple and effective skill to identify the boundary of the orbit so as not to impair the vital organ. Determining the extent of removal of the mucocoele is very important to prevent recurrence and should be carefully planned.

4. Conclusions

Sinonasal mucocoele, which can cause severe vision loss or visual complications, should be treated as quickly as possible. Clinicians should note that minimally invasive surgery to remove ethmoid mucocoeles is relatively straightforward and avoids the complications associated with these lesions.

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