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Giant Mucocele of the Left Frontal Sinus: A Case Report

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Abstract **Case Report**

Giant mucocele of the frontal sinus is a rare pathology of benign entity caused by retention of mucous secretions in the sinus. It may expand and erode the surrounding structures such as bones and cerebral parenchyma. We report an 82-year-old male patient with frontal giant mucocele involving the orbit and intracranial portion of the dura. The main presenting symptoms were a big frontal swelling and proptosis. A computed tomography scan and magnetic resonance imaging were performed to permit differential diagnosis from other pathologies such as ossifying fibroma, fibrous dysplasia, and other neoplasms. A single stage maxillofacial and neurosurgical approach to treatment was taken consisting in the removal of the mucocele. 6 months after surgery, the patient shows no recurrence and satisfactory morphologic and functional results.

Keywords: Giant Mucocele, Frontal Sinus, Proptosis, CT, MRI.

INTRODUCTION

Sinus mucoceles are cystic expansile lesions first described by Lageback in 1820 [1]. The term mucocele was coined by Rollet in 1909. They are most commonly found in the frontal sinus (60-65%), but can also occur in the ethmoid sinuses (20-25%), maxillary sinus (10%), sphenoid sinus (1-2%). Frontal sinus mucoceles may be asymptomatic if they are small. However, if they grow due to their expansive nature, ophthalmic and intracranial complications may sometimes occur due to the proximity of the frontal sinus to the orbit and brain.

Clinically, mucocele should be differentiated from sinusitis and mucous retention cyst due to their similar presentation. Computed tomography (CT) of the sinonasal can help with this differentiation.

Management of mucoceles is exclusively surgical, with two main approaches: It is excised either endoscopically or externally.

CASE REPORT

We report the case of an 82-year-old male patient with a history of recurrent sinusitis and a history of head trauma dating back 10 years, that requiring drainage of an extradural hematoma and a frontal decompressive caniectomy. He presented with symptoms evolving for 2 years, made of mild recurrent headaches with progressively worsening proptosis of the left eye with diplopia and decreased visual acuity, which progressed to blindness. The ophthalmological examination found unilateral ptosis and proptosis of the left eye, a voluminous non-pulsatile frontal swelling, without inflammatory signs and non-axile: the eye was pushed downward and outward (Figure 1). The rest of the general examination, including the otolaryngological (ENT) examination, was unremarkable.

An orbitocerebral CT scan was requested and revealed the presence of an isodense formation in the left frontal sinus, containing spontaneously hyperdense areas. This formation was responsible of an intraorbital and endocranial extension. (Figure 2)

After discussion with the patient, external surgery was decided due to the size of the mucocele and its extension into the noble structures. This consisted of complete excision of the mucocele and the placement of a drainage system. The postoperative course was marked by the disappearance of the proptosis. The 6-month clinical follow-up was satisfactory. (Figures 3; 4)

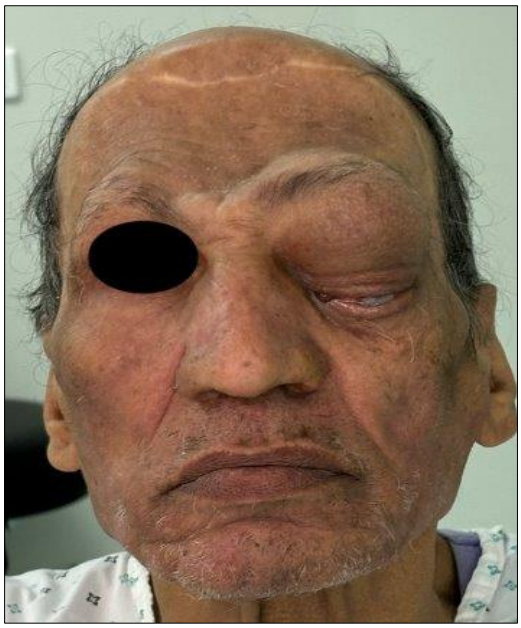

Figure 1: Frontal view of the mucocele of the left frontal sinus

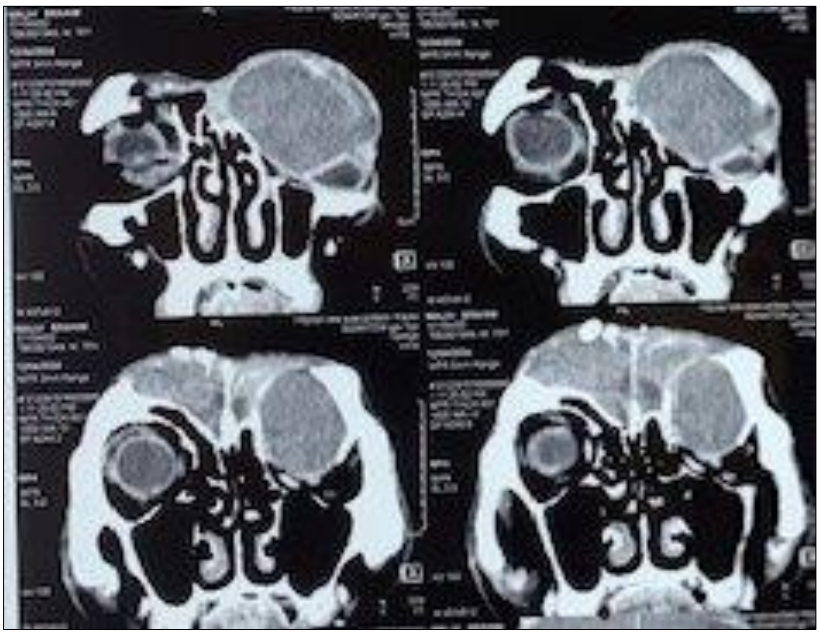

Figure 2: CT-Scan showing the mucocele and its endocranial extension

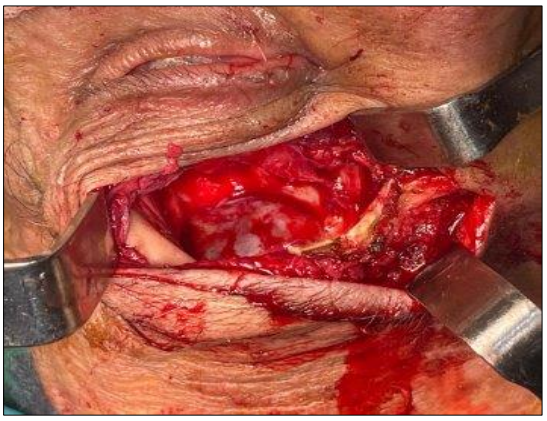

Figure 3: Operative view after the resection of the mucocele

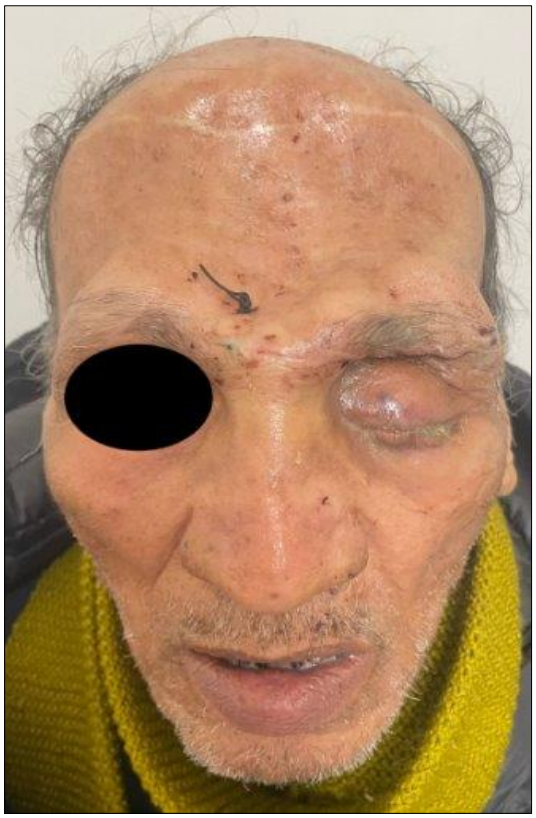

Figure 4: Two days after surgery

DISCUSSION

Mucoceles are collections of mucus enclosed in a sac of sinus lining epithelium within an air sinus resulting from obstruction of the sinus ostium, which can cause expansion out of the sinus by resorption of the bony walls. Mucoceles are slow-growing, benign lesions that usually occur in the frontal or ethmoid sinuses and are rarely found as an isolated intranasal lesion within the confines of the middle turbinate. The sac may become filled with pus as a result of chronic infection, thus being referred to as a chronic pyocele.

Approximately 60–89% occur in the frontal sinus, followed by 8–30% in the ethmoid sinuses and less than 5% in the maxillary sinus. Mucoceles of the sphenoid sinus are rare [2]. Mucoceles can occur at any age, but the majority are diagnosed in patients between the ages of 40 and 60. Men and women are equally affected. Culture of aspirated mucocele contents can sometimes confirm the presence of infection. One study showed that the most common isolates were Staphylococcus aureus, alpha-hemolytic streptococci, Haemophilus species, and Gram-negative bacilli. The predominant anaerobic isolates were Propionibacterium acnes, Peptostreptococcus, Prevotella, and Fusobacterium species [3].

The clinical presentation of mucoceles varies depending on their anatomic site. The onset of symptoms is usually insidious. Patients with frontoethmoidal mucoceles may develop frontal headaches, facial asymmetry, or swelling, as well as ophthalmologic manifestations, such as impaired visual acuity, reduced ocular mobility, or proptosis. The clinical presentation of mucoceles ranges from asymptomatic to disabling headaches and visual disturbances [4]. Proptosis (83%) and diplopia (45%) are the most common complaints [4]. Physical examination reveals periorbital tenderness, swelling, chemosis, decreased visual acuity, and restricted extraocular movement. Intracranial extension through erosion of the posterior frontal sinus wall can lead to meningitis or a CSF fistula. The posterior sinus wall is particularly prone to erosion because it is inherently thin. The tendency for bone erosion and intracranial extension is more common in the presence of infection.

The diagnosis of a mucocele is based on history, physical examination, and radiological findings. There are three criteria for the CT diagnosis of a mucocele: a homogeneous isodense mass, a clearly defined margin, and patchy osteolysis around the mass [4]. Sinus wall erosion with marginal sclerosis is also an indicative finding [4]. In general, mucoceles tend to be quite bright on T1W images relative to the brain and isohyperintense on T2W images [4]. This is a pathognomonic MRI finding for mucoceles [5]. Neoplastic processes tend to be isointense to the brain on both T1 and T2W images [5]. Hyperintensity on T1W images suggests proteinaceous or hemorrhagic content of a lesion [4]. This may lead to misdiagnosis. CT and MRI are complementary in complicated cases.

Treatment of mucoceles is solely surgical, aimed at restoring sinus drainage. It can be approached either endoscopically or by a conventional external approach. In patients with decreased vision, urgent surgery is required, preferably within 24 hours of the onset of visual disturbances. In our case, the left eye was already blind at the moment of his medical consultation. The endonasal endoscopic approach is the most preferred approach today due to its short recovery time, easy access, lower morbidity, and lower incidence of potential complications compared to the intracranial approach [6].

The external approach is generally reserved for frontal mucoceles affecting only the outermost and posterosuperior region of the sinus, or in recurrent cases or mucoceles secondary to an osteoma or orbital herniation. Like in our case, the external approach has the advantage of exposing a complete sinus, allows a complete resection of a giant mucocele and offers the possibility of obliterating the sinus to reduce recurrence. It also allows curettage under vision of the exposed dura mater [7].

Conclusion

Treatment of mucocele is solely surgical, aimed at restoring sinus drainage. The less invasive endoscopic approach is generally preferred, offering faster recovery with a reduced risk of complications. However, it may be associated with a higher recurrence rate. The more invasive external approach remains indicated mainly in recurrent, complex, or large cases.

Acknowledgements

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