

CLINICAL CASE

THE ENDOSCOPIC MANAGEMENT OF ETHMOID MUCOCELE WITH ORBITAL EXTENSION**V. Budu^{1,2}, Andreea-Nicoleta Costache¹, A. Panfiloiu¹, Tatiana Decuseară¹, Alexandra Guligă¹, Lavinia Sava¹, Diana Maria Mistră³, M. Tuşaliu^{1,2}**¹Institute of Phonoaudiology and Functional ENT Surgery “Prof. Dr. D. Hociotă”, Bucharest, Romania²The University of Medicine and Pharmacy “Carol Davila”, Bucharest, Romania³Life Med Medical Center, Bucharest, Romania

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Abstract

Paranasal sinus mucocele represents a quite common pathologic entity, with many questions concerning the ethiology. Generally, the onset of obvious symptoms is delayed until complications appear, notably eye-related. We'll report the case of ethmoido-orbital mucocele, successfully managed by endoscopic marsupialization, in order to accomplish the main goal: restoring ventilation and wide sinus drainage.

Keywords: *ethmoid mucocele, FESS, orbital complications, endoscopic marsupialization***Introduction**

Paranasal sinus mucocele was first identified by Langenbeck as hydatides in 1820. Its surgical drainage was promoted by Berthon in 1880. The first histopathological description was made by Onodi in 1901. The term mucocele was introduced by Rollet in 1909 [1]. It is an respiratory epithelium lined formation, mucus-containing and expansile. Its progression provokes a sinus bone wall bulging and resorption, with subsequent displacement of neighboring structures, especially orbital content. The frontoethmoidal location is the most frequent, followed by the sphenoid occasionally and the maxillary sinus rarely [2]. Common causes of this pathology are multiple: chronic rhinosinusitis, allergy, maxillofacial trauma, prior sinus surgery (external or endoscopic), anatomical anomalies, osteoma, fibrous dysplasia, ossifying fibroma, neoplasm, but it can also be idiopathic [3-6].

Close proximity of paranasal sinus mucocele to the orbit and skull base predisposes to an intraorbital and endocranial extension [7]. Diagnosis is mainly imaging, CT scan or MRI. Computed tomography (CT scan) is the first imaging modality for locating the disease, it gives better evidence of any bone changes and supports surgical planning. Magnetic resonance imaging (MRI) should be done additionally, when searching out for an intracranial and/or orbital expansion but also for better differentiation from other benign or malignant tumor masses [8].

The current procedure of choice for the management of paranasal sinus mucocele is marsupialization via endoscopic transnasal surgery, achieving enlarged sinus outflow and ventilation pathways. This technique was first described by Kennedy in 1989 and represents gold standard for all paranasal mucocele locations.

Case report

A 46 year old patient presented intermittent left nasal obstruction, headache and eye-related symptoms: intermittent diplopia in the last 6 months and ipsilateral eye displacement for 3 months. Complete physical examination and nasal endoscopy revealed sero-mucous discharge in the left nasal fossa and a bulging left uncinate process with middle meatal obstruction. Blood tests were normal, except for elevation of glucose level 131 mg/dl and alanine transaminase ALT 62 U/l.

Native and contrast CT scan on nose and paranasal sinuses revealed a non-enhancement hyperdensity mass of 17/12/27mm, at the left anterior ethmoid cells and left frontal sinus (Figure 1). There was a large lamina papyracea dehiscence in its anterior portion and a tumor mass effect of the left orbit and left medial rectus.

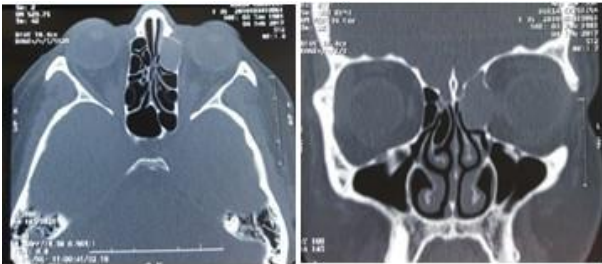


Figure 1 - CT scan- axial and coronal sections

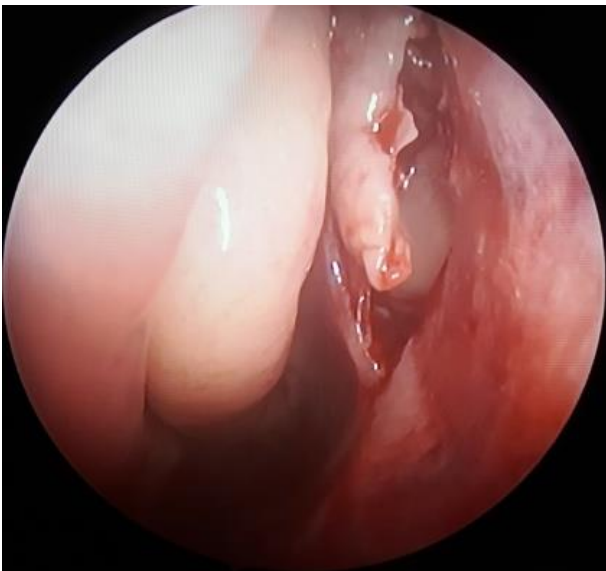


Figure 2 - Uncinate process removed

The magnetic resonance imaging (MRI) performed on a 3T field strength system provided an ovoid well delineated image, about 12 mm axial /17 mm sagittal/ 27 mm coronal section, located in the forward left anterior ethmoid cells, with impaired drainage of left

frontal sinus. The lesion had a rich protein content and was hyperintense on T1-weighted images, also with fat suppression technique.

We decided on an endoscopic marsupialization under general anesthesia, with complete removal and wide drainage of left ethmoido-orbital mucocele.

After local vasoconstrictive/ anesthetic infiltration at the anterior insertion of the middle turbinate, the uncinate process was removed in order to expose the ethmoid infundibulum (Figure 2).

Then, the bulla ethmoidalis was opened (Figure 3) and an abundant mucoid content was sucked out (Figure 4).

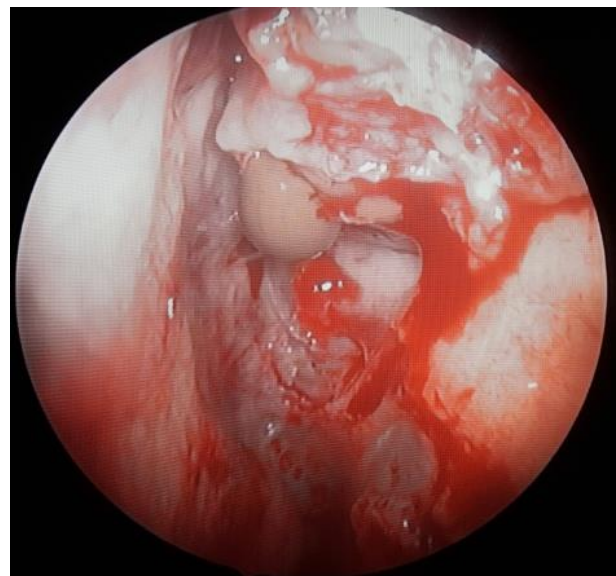


Figure 3 - Opening of the bulla ethmoidalis

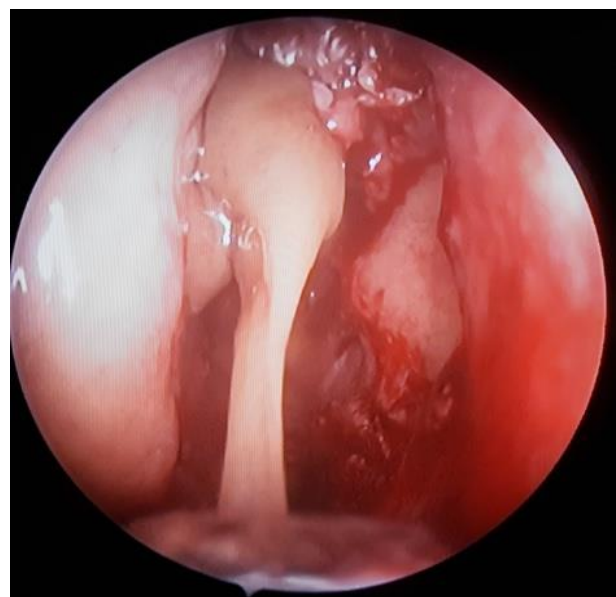


Figure 4 - Aspiration of mucocele content

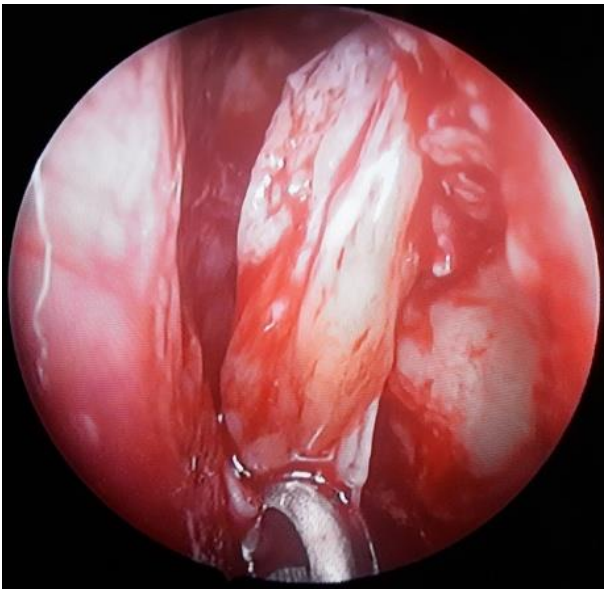


Figure 5 - Excision of outer membrane

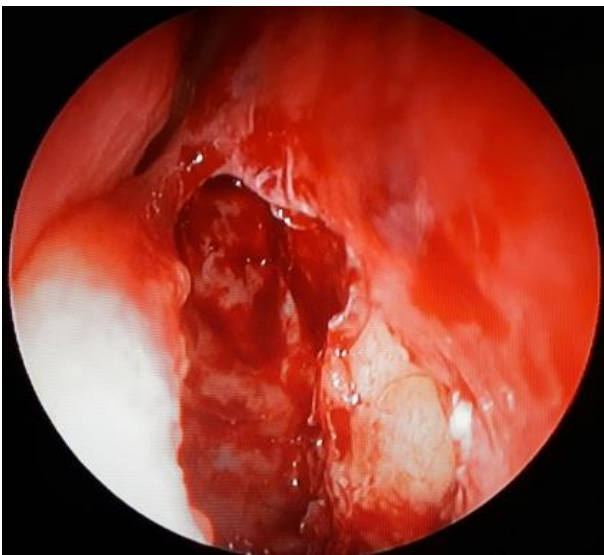


Figure 6 - Dehiscent lamina papyracea

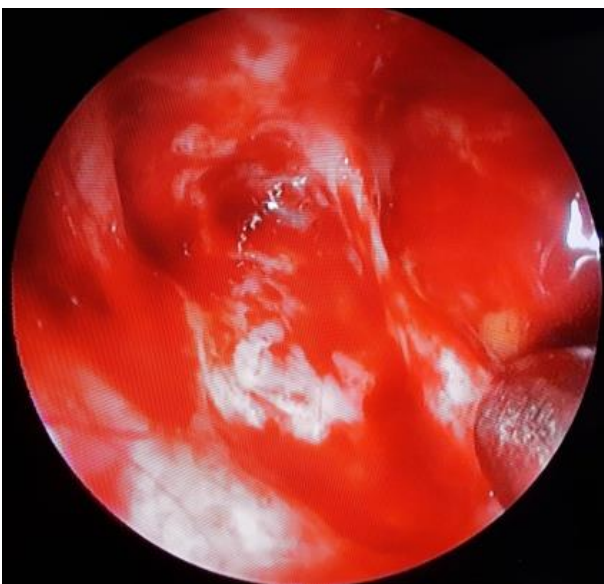


Figure 7 - Wide opening of the frontal recess but intact periorbital (Tenon's capsule)

At the end, the outer mucocoele membrane was totally excised (Figure 5). We found a big dehiscence of lamina papyracea (the lateral wall of bulla ethmoidalis) without periorbital extension (Figure 6).

Final cavity control ensured that frontal recess was widely opened (Figure 7), reaching the goal of mucocoele marsupialization. Haemostasis was made by anterior nasal packing with expandable sponges, removed after 24 hours, without any bleeding.

Discussions

Paranasal sinuses mucocele is an expanding and destructive benign entity. Due to bone destruction, this formation may evolve invasively to neighboring structures, which can be endocranium and/or orbit [9]. The bony remodeling pathophysiology needs more complete understanding but it's presumed that involves a mass effect on blood vessels, in conjunction with inflammatory cascade (prostaglandins, endothelial adhesion molecules and cytokines IL1, IL6) at the interface level [5].

The clinical presentation is variable depending on mucocele location and includes: frontal headache, eye pain, facial pressure, nasal obstruction, diplopia, proptosis, decreased visual acuity, facial edema and CSF leak [10,11]. The diagnosis is based on the clinical history, physical examination together with nose endoscopy and imaging findings. CT scan and MRI should be complementary when evaluating complications. The imaging features on CT scan are: well-circumscribed, homogenous, hyperdense content mass, with unequal erosions of surrounding bony walls [2]. Because of increased protein content, the lesion has a typical hyperdense to brain (bright) appearance in T1 and a hypodense (dark) appearance in T2, non-gadolinium enhanced on MRI scan [12].

Endoscopic marsupialization is the gold-standard treatment for paranasal sinus mucocele. Combined approach (endoscopic and external procedures) may be required in the case of endocranial extension. It is important to remember that incomplete drainage predisposes to relapses.

In the case presented, the orbital extension involved lamina papyracea, without harming the

periorbita. It could be managed exclusively through endoscopic marsupialization, minimizing the risk of relapse and complications (orbital and endocranial).

Conclusions

1. Many patients with orbital expansion of the mucocele first appeal to the ophthalmologist. In the presence of proptosis or globe displacement, an ENT examination is highly recommended.

2. The CT scan is the gold-standard for diagnosis of ethmoid mucocele. It should be done together with complementary MRI when evaluating potential complications.

3. The treatment of the paranasal sinus mucocele is primarily surgical. Currently, there is successfully managed through endoscopic marsupialization, for all locations. A combined approach may be required in selected cases.

4. The endoscopic marsupialization is a safe and elementary procedure and the rates of recurrence and morbidity are minimal.

References

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