

Journal of Bacteria Research

The Endoscopic Approach of the Sphenoid Sinus Mucocele – A Case Report

Vlad Budu^{*}, Alexandra Guligă, Andreea Nicoleta Costache, Tatiana Decuseară, Alexandru Panfiloiu and Mihail Tuşaliu

Institute of Phonoaudiology and Functional E.N.T. Surgery "Prof. Dr. D. Hociotă", Bucharest

*Corresponding author: Vlad Budu, Ph.D., Institute of Phonoaudiology and Functional E.N.T. Surgery "Prof. Dr. D. Hociotă", Bucharest, Romania; Tel: +40788413218; E mail: vladbudu@yahoo.com

Article Type: Case Report, Submission Date: 07 October 2016, Accepted Date: 26 October 2016, Published Date: 05 May 2017.

Citation: Vlad Budu, Alexandra Guligă, Andreea Nicoleta Costache, Tatiana Decuseară, Alexandru Panfiloiu and Mihail Tuşaliu (2017) The Endoscopic Approach of the Sphenoid Sinus Mucocele – A Case Report. J. Bactr Resol 1(1): 8-11.

Copyright: © **2017** Vlad Budu, et al. This is an open-access article distributed under the terms of the Creative Commons Attribution License, which permits unrestricted use, distribution, and reproduction in any medium, provided the original author and source are credited.

Abstract

Background: The sphenoid mucocele represents a sack-like formation lined by an epithelium, with a mucous content which, within this location, may lead to serious complications.

Case presentation: The authors aim to present a clinical case of a sphenoid mucocele diagnosed through computed tomography and magnetic resonance imaging, which underwent functional endoscopic sinus surgery. An endoscopic approach of the sphenoid sinus was performed, identifying the mucocele, and the therapeutic solution consists of endoscopic marsupialization and removal of its membrane, in order to avoid recurrence.

Conclusion: The mucocele's content proved to be sterile from a bacterial point of view, inspite of the *Staphylococcus aureus* discovered in the nasal secretion.

Keywords: Sphenoidal mucocele, Endoscopic sinus surgery, Endoscopic marsupialization.

Introduction

Sinus mucocele is a saccular lesion lined by an epithelium, with a mucous content. In terms of manner of occurrence it is divided into primary (cysts with mucous content, occurring *de novo*) and secondary, consequence of an ostium obstruction that entails chronic sinus inflammation, traumatic or iatrogenic actions [1].

From a pathophysiological point of view, an accumulation of secretions occurs at the level of the sinus mucosa, which, in lack of drainage, determines an encysted structure characterized by slow growth and damage of the surrounding anatomic areas over time [2].

Due to the dynamic processes of osteogenesis and bone resorption induced by the mucocele, some extending lesions appear, leading in time to the destruction of the sinus walls. This determines the occurrence of serious complications such as orbital infection, intracranial lesions and intracystic haemorrhages, which may lead to cephalalgia with retro-orbital localization [3,4]. In terms of the location of the mucocele inside the paranasal sinuses, it is most frequently discovered at the level of the frontal sinus, followed in descending order by the maxillary, ethmoidal, sphenoid sinuses [5].

Mucocele occurs in the sphenoid sinus in 1-2% of cases, however at this level it may lead to complications such as lesions of the *dura mater*, pituitary gland, optic nerve, internal carotid artery, and oculomotor, trochlear, trigeminal and abducens cranial nerves [6].

Case Report

The authors report the case of a male patient, 40 years old, without ENT medical history, admitted to the Institute of Phonoaudiology and Functional E.N.T. Surgery "D. Hociotă"– Wards I with right unilateral retro-orbital cephalalgia, whose onset was approximately 10 days prior, and posterior rhinorrhea.

ENT physical examination and nasal endoscopy were consistent with a left lateral-deviation of the nasal septum and hypertrophy of the inferior nasal turbinates.

CT scan revealed an oval, well-delimited tumour lesion, with homogenous content, located at the level of the right sphenoid sinus, adherent to the intersinus septum, located between the inferior and the posterior-superior sphenoid walls, where it lined the *sella turcica* region (Figure 1).

At the level of the right sphenoid lateral wall, mucocele is located close to the right carotid canal (Figure 2).

Prior to the surgery, the nasal exudate was sampled and sent to the bacteriology laboratory in order to perform a bacteriologic and mycological exam, where the *Staphylococcus aureus* was identified and the antibiotic treatment was initiated according to the antibiogram.

The bacteriologic exam of nasal exudate is an important step to exclude the presence of S. aureus in the surgical area. Infact, the ability of these bacteria to invade osteoblasts and to induce osteo-pathogenesis is well-known in literature [7]. **Citation:** Vlad Budu, Alexandra Guligă, Andreea Nicoleta Costache, Tatiana Decuseară, Alexandru Panfiloiu and Mihail Tuşaliu (2017) The Endoscopic Approach of the Sphenoid Sinus Mucocele – A Case Report. J. Bactr Resol 1(1): 8-11.

After 24 hours of treatment, the patient underwent functional endoscopic sinus surgery (FESS) with paraseptal approach of the right sphenoid sinus.

After the lateralization of the middle nasal turbinate, the right sphenoid-etmoidal recess is visualised, and optimum approach of the sphenoid sinus is obtained. Rezection of the upper nasal turbinate was performed from the level of its inferior insertion on the sphenoid anterior wall and superior from the level of the skull base.



Figure 1: Retrosellar extension of the mucocele



Figure 2: Mucocele close to the right carotid canal

After the opening of the sphenoid sinus ostium, its inferior enlargement was realized with the Stammberger sphenoid punch, visualising the mucocele (Figure 3).

The fine needle aspiration and sampling of the mucocele content was performed, and specific media (blood agar and Sabouraud agar) was inseminated for analysis in bacteriology, in order to identify the pathogenic germ (Figure 4). Subsequently, the ablation of the content was performed with the aid of a rigid 45° endoscope. After the removal of the mucocele's content, the membrane is removed.

Endoscopically, the residual cavity is inspected after the removal of the mucocele, and there were no breaches found at the level of the sphenoid sinus walls. A Gelaspon type sterile hemostatic sponge is applied inside the cavity (Figure 5).

The local and general evolution was favorable, with the remission



Figure 3: Enlargement of the right sphenoid ostium



Figure 4: Fine needle aspiration and sampling of the mucocele content



Figure 5: Residual sinus cavity

of the patient's symptoms. He shall be monitored clinically and endoscopically, according to an active therapy protocol.

Discussions

The sphenoid mucocele represents 1-2% of the total mucoceles located at paranasal sinuses level, usually developing in the fourth decade, without favoring a gender [8,9].

From an anatomopathological perspective, the sphenoid mucocele is a disorder with a benign character, which may lead

Citation: Vlad Budu, Alexandra Guligă, Andreea Nicoleta Costache, Tatiana Decuseară, Alexandru Panfiloiu and Mihail Tuşaliu (2017) The Endoscopic Approach of the Sphenoid Sinus Mucocele – A Case Report. J. Bactr Resol 1(1): 8-11.

however to complications such as lesions of the *dura mater*, pituitary gland, optical nerve, cavernous sinus, internal carotid artery and IIIrd, IVth, Vth, VIth cranial nerves. The complications sometimes found within this pathology include diplopia, blindness, meningitis, cavernous sinus thrombosis, compression of the internal carotid artery [10].

Similar to the presented case, the most common symptom incriminated by the patients with sphenoid mucocele is represented by cephalalgia, frequently located in the retroorbital or supra-orbital region. It was suggested that the origin of the cephalalgia may be the stretching of the *dura mater* on the sphenoid plan [8,9].

The assessment of the sphenoid mucocele is performed with the aid of the computed tomography exam, which appreciates both the lesion characteristics as well as the surrounding extension. It must be set apart from cystic lesions such as craniopharyngioma, arachnoid cyst, Rathke cleft's cyst, epidermoid cysts, optic nerve glioma, pituitary adenoma. The magnetic resonance imagistic examination is preferred to the computerized tomography because it allows a better characterization of the mucocele content, as the mucus has a significant protein density and allows for confirmation of the diagnosis as well as stating its extension degree [8,11].

The presence of the mucopurulent posterior rhinorrhea required its sampling in order to perform a bacteriologic exam, which identified the *Staphylococcus aureus*. According to the antibiogram, the *Staphylococcus aureus* was sensitive to Augmentin, Gentamicin, Levofloxacin, Oxacilin, Chloramphenicol and a treatment with Levofloxacin was initiated.

The antibiotic treatment led to the decrease of the posterior rhinorrhea, however without providing any effect on the patient's retro-orbital cephalalgia.

The sphenoid mucocele treatment is mainly surgical through the endoscopic marsupialization technique and removal of the membrane, in order to avoid relapse [12] (Figure 6).



Figure 6: Removal of the mucocele membrane

No pathogenic germ was identified in the mucocele puncture sample. The infection with the *Staphylococcus aureus* at the level of the nasal fossa was not responsible for the occurrence of the sphenoid mucocele, which was formed because of the obstruction and enlargement of a mucous glandular duct [12].

The endoscopic surgical treatment consisted in the total ablation of the mucocele, with the complete remission of the symptoms and patient's pathology. The follow-up at 1, 3, 6, 12 months identified a free sphenoid recess and an open sphenoid sinus, free of macroscopic signs of mucocele residue or relapse.

Conclusions

However rarely met in the sphenoid sinus, the mucocele found at this level may present important extension to the surrounding anatomic areas, with evolution towards complications with neurovascular vital risk.

The symptoms for which patients demand medical support are represented by retro-orbital or supra-orbital cephalalgia and posterior rhinorrhea.

The diagnosis of sphenoid mucocele is decided using imagistics through computerized tomography examination which allows viewing of the lesion's limits and magnetic resonance imagistics which confirms and, in addition, states the extension degree on the surrounding anatomic structures.

The treatment is exclusively surgically, the modern endoscopic technique replacing the transfacial or transcranial classical approaches, performing sufficient drainage and avoiding the relapses.

Although the secretion sampled at the level of the posterior third of the nasal fossa identified the *Staphylococcus aureus*, it could neither be found at the level of the sphenoid sinus, nor at the level of the mucocele content, the endonasal staphylococci infection not being responsible for the occurrence of the sphneoid mucocele.

References

- 1. Popescu I, Ciuce C, Sarafoleanu C, Tratat de chirurgie Ed. a II-a, Bucuresti, editor. Academiei Romane. 2012; 1:69.
- Budu V, Chirurgia Endoscopica Rinosinusala, editor. Universitara "Carol Davila", Bucuresti. 2014; 3:65.
- Dispenza C, Saraniti C, Caramanna C, Dispenza F. Endoscopic treatment of maxillary sinus mucocele. Acta Otorhinolaryngol Ital. 2004; 24(5):292-296.
- Chen TM, Lee TJ, Huang TS. Endoscopic sinus surgery for the treatment of frontoethmoidal mucocele complicated with orbital abscess. Changgeng Yi Xue Za Zhi. 1997; 20(1):39-43.
- Younis RT, Lazar RH, Bustillo A, Anand VK. Orbital infection as a complication of sinusitis: are diagnostic and treatment trends changing. Ear Nose Throat J. 2002; 81(11):771-775.
- 6. Bahgat M, Bahgat Y, Bahgat A. Sphenoid sinus mucocele. BMJ Case Reports. 2012; 2012. doi: 10.1136/bcr-2012-007130.
- Arciola CR, Hänsch GM, Visai L, Testoni F, Maurer S, Campoccia D, et al. Interactions of staphylococci with osteoblasts and phagocytes in the pathogenesis of implant-associated osteomyelitis. Int J Artif Organs. 2012; 35(10):713-726. doi: 10.5301/ijao.5000158.
- Friedman A, Batra PS, Fakhri S, Citardi MJ, Lanza DC. Isolated sphenoid sinus disease: etiology and management. Otolaryngol Head Neck Surg. 2005; 133(4):544–50.

Citation: Vlad Budu, Alexandra Guligă, Andreea Nicoleta Costache, Tatiana Decuseară, Alexandru Panfiloiu and Mihail Tuşaliu (2017) The Endoscopic Approach of the Sphenoid Sinus Mucocele – A Case Report. J. Bactr Resol 1(1): 8-11.

- Moriyama H, Hesaka H, Tachibana T, Honda Y. Mucoceles of ethmoid and sphenoid sinus with visual disturbance. Arch Otolaryngol Head Neck Surg. 1992;118(2):142–6. doi:10.1001/ archotol.1992.01880020034012.
- Lee LA, Huang CC, Lee TJ. Prolonged visual disturbance secondary to isolated sphenoid sinus disease. Laryngoscope. 2004; 114(6):986– 999.
- Kennedy DW, Josephson JS, Zinreich SJ, Mattox DE, Goldsmith MM.. Endoscopic sinus surgery for mucoceles: a viable alternative. Laryngoscope. 1989; 99(9):885–895.
- Budu V, Bulescu IA, Decuseară T, Cojocarii D, Schnaider A, Mocanu
 B. Endoscopic approach of rinosinusal mucocele. ORL.ro. 2015; 8(27):10-14.