

## CONCURRENT MIDDLE AND INFERIOR MEATUS ANTROSTOMY FOR THE TREATMENT OF MAXILLARY MUCOCELES

SILVIU ALBU<sup>1</sup>, ALINA GABRIELA DUTU<sup>2</sup>

<sup>1</sup>2nd Department of Otolaryngology, Iuliu Hatieganu University of Medicine and Pharmacy, Cluj-Napoca, Romania

<sup>2</sup>Department of Medical Biochemistry, Iuliu Hatieganu University of Medicine and Pharmacy, Cluj-Napoca, Romania

\*both authors have equally contributed to the article

### Abstract

**Background and aims.** This study describes the technique of simultaneous middle and inferior antrostomy and outlines its usefulness in the management of maxillary mucoceles.

**Methods.** This is a retrospective review of 12 consecutive patients with isolated maxillary mucocele operated on by means of middle and inferior antrostomy technique. We describe the clinical picture, details of the surgical technique and outcomes.

**Results.** There were 7 males and 5 females with ages ranging from 20 years to 65 years (mean 42 years). One patient had past trauma to the face and one had a long history of chronic sinusitis. Eight patients had undergone multiple previous sinus operative procedures including Caldwell-Luc approach. All patients underwent middle and inferior antrostomy without complications. Follow-up was between 12 months and 60 months (mean 36 months) with no recurrences to date.

**Conclusion.** In conclusion the results of our small series support the worth of using middle and inferior antrostomy when dealing with maxillary mucoceles.

**Keywords:** mucocele, maxillary sinus, middle meatus antrostomy, inferior antrostomy

### Introduction

A mucocele is a slowly expanding, mucus-filled, epithelium-lined cystic mass subsequent to sinus obstruction and accumulation of mucus [1,2]. The frontal and ethmoid sinuses are more common locations, while mucoceles of the maxillary sinus account for only 3% to 10% of all cases [2-4]. Maxillary mucoceles are more commonly reported in Japan, representing a long term complication of the Caldwell-Luc technique [5]. Historically, the surgical management of mucoceles was complete excision through the Caldwell-Luc method, nasoantral window and removal of the mucocele lining in order to prevent recurrence [5,6]. Since the traditional Caldwell-Luc approach is associated

with significant morbidity [7], lately the endonasal endoscopic marsupialization has substituted it [1-4]. However, the position of the antrostomy has been a matter of controversy: Huang et al. [8] advocated the superiority of middle meatus antrostomy (MMA), while Lee et al. [9] suggested that in postoperative maxillary mucoceles, the inferior meatus antrostomy (IMA) should be the technique of choice. On the other hand, Durr and Goldberg [10] suggested the use of endoscopic medial maxillectomy with mucosal flap technique in postoperative maxillary mucoceles situated in difficult accessible positions. We have recently described the advantages of simultaneous middle and inferior antrostomy (MIMA) in the symptomatic and objective improvement of patients presenting massive polyposis and severely diseased maxillary sinus [11]. The present report refers to the use of MIMA technique in the management of maxillary mucoceles.

Manuscript received: 01.02.2017

Received in revised form: 09.05.2017

Accepted: 10.05.2017

Address for correspondence: alinagabriela.dutu@yahoo.com

### Patients and methods

This study was approved by the Institutional Review Board of the University Hospital CFR Cluj-Napoca. This is a retrospective review of consecutive patients with isolated maxillary mucocele treated by the senior author between 2003 and 2013. The diagnosis of maxillary sinus mucocele was established based on history, physical examination, including nasal endoscopy, as well the CT scan results. Thinning of the surrounding bone and areas of erosion were present in all scans (see Figure 1 and 2). Data collected included age, gender, presenting symptoms, past medical history, operative technique details, complications and recurrence.

Surgery was performed on all 12 patients under general anesthesia and comprised performing the MIMA technique as previously described [11]. Septal surgery was

performed when indicated. Firstly, a classical MMA was completed. In 7 patients partial resection of the anterior end of the inferior turbinate was necessary to achieve sufficient access to the lateral nasal wall. The entry point into the sinus was at the thinnest bony portion. Once the mucocele was entered, fluid was suctioned out completely. The maxillary opening was enlarged with straight-cutting and back-biting forceps in an antero-posterior direction. Care was taken to avoid injury to the nasolacrimal duct.

Nasal packing was removed after 24 hours and the patient discharged home. Postoperative visits were performed every 3 months following the procedure. No postoperative imaging was done in this study and outcome was grounded on the resolution of symptoms and patency of the antrostomies.

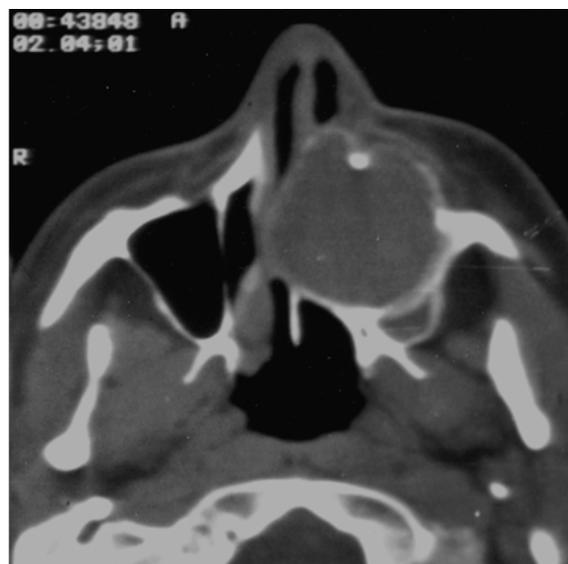


a)



b)

**Figure 1.** a) Coronal CT of a left maxillary mucocele, b) Axial CT of the same patient.



**Figure 2.** Axial CT of a maxillary mucocele.

### Results

A number of 12 patients with a diagnosis of isolated maxillary mucocele were treated by the senior author at the 2nd Otolaryngology Department, Iuliu Hatieganu University of Medicine and Pharmacy of Cluj-Napoca between 2003 and 2013. There were 7 males and 5 females with ages ranging from 20 years to 65 years (mean 42 years). One patient had past trauma to the face and one had a long history of chronic sinusitis. Eight patients had undergone multiple previous sinus operative procedures including Caldwell-Luc approach. The mean period between the open sinus operations and the diagnosis of mucocele was 24 years (range 12- 40 years).

The most common presenting symptom was unilateral nasal obstruction, reported by 10 patients, followed by cheek pressure (9 patients), purulent nasal discharge (4 patients), and sensory deficit in the territory of the infraorbital nerve (4 patients). One patient reported diplopia as the primary symptom. All patients had unilateral mucoceles.

There were no intraoperative or postoperative complications. No postoperative bleedings or epiphora were recorded in our cohort. Follow-up was 12 months to 60 months (mean 36 months) with no recurrences to date. At the last follow-up visit both antrostomies were patent and sinus mucosa was normal

### Discussion

According to the tenets of endoscopic nasal surgery, MMA is credited with enhanced functional features compared to IMA [8,11]. In postoperative maxillary mucoceles lower recurrence rates were reported in MMA as compared to IMA [2,8]. However, it was acknowledged that even an enlarged MMA does not allow precise control of the entire maxillary sinus pathology, especially in areas such as the alveolar recess, the anterior, medial and far lateral walls [11]. Therefore, Lee et al. [9] claim the benefits of IMA in dealing with maxillary mucoceles. Following previous surgery, local anatomy is distorted: bony thickening, decreased size and contraction of the maxillary sinus are encountered [9]. Alternatively, scarring within the ethmoid renders the appreciation of uncinat process difficult, thus MMA may be technically challenging. In their study the authors claim that in 4 of 21 MMA patients, attempts to fashion an antrostomy failed [9]. Besides, mucoceles appear as a protruding mass positioned on the lateral nasal wall and fenestration in the inferior meatus is straightforward. Recently, Durr and Goldberg [10] described a technique of endoscopic partial medial maxillectomy with mucosal flap placed over the inferior bony border. The authors claim that by preventing restenosis this is an effective technique.

Since in severely diseased maxillary sinus the traditional MMA is unable to totally reestablish the mucociliary clearance, the MIMA approach was promoted

[10]. Better outcomes were probably related to better clearance of the diseased sinus and improved drainage and ventilation provided by the two openings. Since the bone itself of the inferior meatus may represent a source of chronic infection, the inferior window has an additional advantage [10]. Despite the already cited advantages of IMA we took every effort to generate a MMA for the well-known reasons: clearance of the diseased ethmoid and providing the maxillary sinus with a physiologic long-term ventilation and drainage route [1,8,10]. Besides, persistence of disease within the ethmoid is a well-known reason for recurrent maxillary sinusitis. In all of our patients we were able to craft the MMA. The grouping of the two antrostomies brings about several rewards: provides a better outlook to that obtained from one opening alone and, more importantly manipulation of angled instruments within the sinus is significantly assisted when working through the inferior opening and maintaining visualization through the MMA. An additional advantage of MIMA compared to endoscopic partial medial maxillectomy might be the preservation of the inferior turinate in order to prevent the postoperative empty nose syndrome. During the postoperative period mucus and crusts are easily eliminated through the inferior window. When supplementary postoperative treatments are demanded, instruments and medication are easily introduced through the IMA. Combining the two windows in maxillary mucoceles provided long term symptomatic relief.

### Conclusion

Although both MMA and IMA techniques are reliable techniques in the management of maxillary sinus mucoceles, the results of our small series support the value of using the combined middle and inferior antrostomy method.

### References

1. Har-El G. Endoscopic management of 108 sinus mucoceles. *Laryngoscope*. 2001;111:2131–2134.
2. Caylakli F, Yavuz H, Cagici AC, Ozluoglu LN. Endoscopic sinus surgery for maxillary sinus mucoceles. *Head Face Med*. 2006 Sep 6;2:29.
3. Marks SC, Latoni JD, Mathog RH. Mucoceles of the maxillary sinus. *Otolaryngol Head Neck Surg*. 1997;117:18-21.
4. Busaba NY, Salman SD. Maxillary sinus mucoceles: clinical presentation and long-term results of endoscopic surgical treatment. *Laryngoscope*. 1999;109:1446–1449.
5. Hasegawa M, Saito Y, Watanabe I, Kern EB. Postoperative mucoceles of the maxillary sinus. *Rhinology*. 1979;17:253–256.
6. Kaneshiro S, Nakajima T, Yoshikawa Y, Iwasaki H, Tokiwa N. The postoperative maxillary cyst: report of 71 cases. *J Oral Surg*. 1981;39:191–198.
7. DeFreitas J, Lucente FE. The Caldwell-Luc procedure: institutional review of 670 cases: 1975-1985. *Laryngoscope*. 1988;98:1297–1300.
8. Huang CC, Chen CW, Lee TJ, Chang PH, Chen YW, Chen YL, et al. Transnasal endoscopic marsupialization of postoperative

maxillary mucoceles: middle meatal antrostomy versus inferior meatal antrostomy. *Eur Arch Otorhinolaryngol.* 2011;268:1583–1587.

9. Lee JY, Baek BJ, Byun JY, Shin JM. Long-term efficacy of inferior meatal antrostomy for treatment of postoperative maxillary mucoceles. *Am J Otolaryngol.* 2014;35(6):727-730.

10. Durr ML, Goldberg AN. Endoscopic partial medial maxillectomy with mucosal flap for maxillary sinus mucoceles. *Am J Otolaryngol.* 2014;35(2):115-119.

11. Albu S, Gocea A, Necula S. Simultaneous inferior and middle meatus antrostomies in the treatment of the severely diseased maxillary sinus. *Am J Rhinol Allergy.* 2011 Mar-Apr; 25(2):e 80-e85.