CASE REPORT

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Silent Sinus Syndrome, a case presentation*

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SUMMARY

"Silent Sinus Syndrome" is a quite rare condition of otherwise asymptomatic maxillary sinusitis that presents with enophthalmos.
Despite the fact that the "Silent Sinus Syndrome" presents with enophthalmos, these patients are finally treated by the otorhinolaryngologist, who should be familiar with this condition, in order to facilitate prompt diagnosis and treatment.
We present the case of a 33 year old man with enophthalmos and no other associated symptom that was caused by chronic rhinosinusitis. Functional endoscopic sinus surgery was the treatment of choice. No reconstruction of the orbital floor was performed.
One year follow up, following surgical treatment revealed an excellent result.

Key words: silent sinus syndrome, enophthalmos, maxillary sinusitis, chronic rhinosinusitis

INTRODUCTION

Enophthalmos is a common symptom caused by any process that leads to disruption of the orbital floor, causing displacement of the orbital contents within the respective maxillary or ethmoid sinus. Trauma causing "blow out" fractures is considered as the main cause of enophthalmos [1,2]. Except of traumatic and post-surgical enophthalmos, spontaneous enophthalmos has also been reported; usually caused by malignancy, osteomyelitis or systemic inflammatory diseases [2,3]. Benign enophthalmos is quite rare, secondary to neurofibromatosis, chronic rhinosinusitis or maxillary mucoceles [2-4]. Moreover, benign enophthalmos appears in conjunction with other symptoms, characteristic of these conditions. However, there are a few cases of otherwise asymptomatic benign enophthalmos associated with maxillary sinusitis; the so called "Silent Sinus Syndrome" [5].

Usually enophthalmos merits referral to an ophthalmologist. However, as it may develop secondary to chronic maxillary sinusitis it is important for the otorhinolaryngologist to be familiar with this condition, in order to facilitate diagnosis and treatment.

We present the case of a 33 year old man with enophthalmos and no other associated symptom that was caused by chronic rhinosinusitis. One year follow up, following surgical treatment revealed an excellent result.

CASE REPORT

A 33 year old man was referred to the ENT outpatient clinic of the Ippokration Athens Hospital, by his private ophthalmologist.

The patient reported dryness of his left eye, as well as a sensation of heaviness of the respective upper eyelid. Additionally, he reported a change of the shape of his left palpebral fissure as well as an "inwards and back" displacement of the respective orbital contents. He did not report facial pain or other signs or symptoms.

Detailed history revealed no trauma or surgery in the past, or allergy problems. The patient did report intermittent blockage of his left nostril during nocturnal hours. Additionally, he reported an episode of acute rhinosinusitis about 2 years before, which resolved fully. It should be noted that the patient was a keen diver over the last decade, reaching depths of 15 meters, and that occasionally he experienced a sensation of pressure and pain over his left maxillary sinus during diving. The patient was otherwise well, with no other medical or ocular history.

Clinical examination revealed a moderate deviation of the septum towards the left. No nasal discharge was observed. Ophthalmologic examination did not reveal any disturbance of his visual acuity, diplopia or restrictions of eye movements. Exophthalmometry was 10mm left and 12mm right at base 109. The remainder of ophthalmologic examination was unremarkable.

The results of all screening blood tests, including thyroid function tests, were within normal limits.

Computed tomography (CT) of the sinuses and orbits (Figure 1) revealed complete opacification of the left maxillary antrum, with concurrent disruption of the orbital floor and prolapse of the content of the orbit into the antrum, lower than the level of the middle meatus, as well as proptosis of post-orbital fat.

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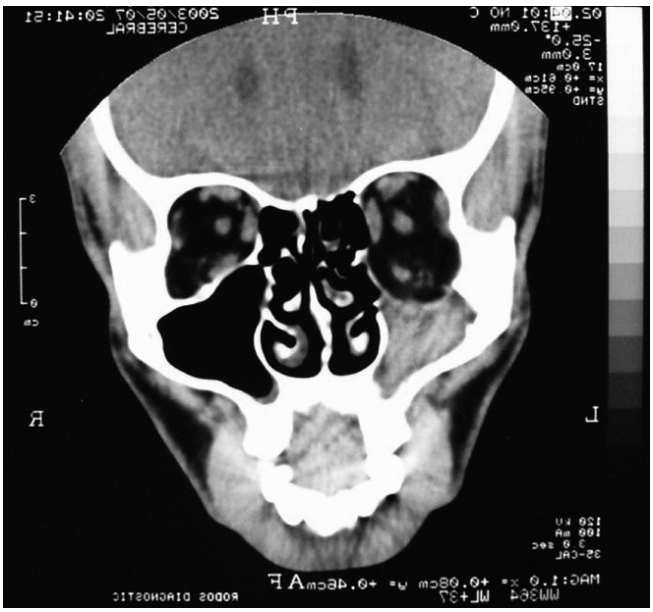

Figure 1. Preoperative CT. Opacity of the left maxillary antrum. Note the concurrent disruption of the orbital floor and the prolapse of the content of the orbit into the antrum.

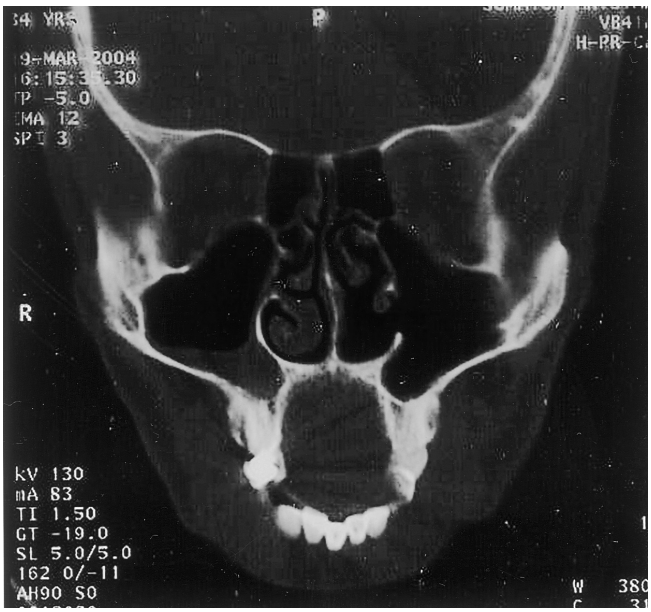

Figure 2. Postoperative CT. The left maxillary sinus is well ventilated, the orbital volume has been restored and the orbital contents are in their normal position.

Slight oedema at the area of the inferior rectus muscle was observed, whereas the rest of the ocular muscles appeared normal.

Magnetic Resonance Imaging (MRI) of the sinuses and orbits that followed for further investigation of the soft tissues did not reveal entrapment of any muscle, or any soft tissue masses.

Functional endoscopic sinus surgery was the treatment of choice. Initially a septoplasty was performed, offering improved access and eliminating a possible aetiological obstruction factor. Due to the low proptosis of the orbit an inferior meatal antrostomy was performed. Copious amounts of mucopurulent content was removed and the erosion of the bony orbital floor was confirmed, whereas the periorbita appeared intact. Gentle pressure on the globe caused tissue prolapse into the sinus. A wide antrostomy was performed, in order to achieve adequate ventilation of the antrum. No reconstruction of the orbital floor was performed.

Postoperative follow up in 2 months revealed a marked improvement of the enophthalmos and no recurrence of rhinosinusitis. Six months follow up with a new CT (Figure 2) revealed good ventilation of the left maxillary sinus, restoration of the orbital volume and partial withdraw of the orbital content to its normal position. One year after the procedure no further complaint or symptom is reported and the patient reports being fully satisfied by the outcome

DISCUSSION

Montgomery et al. [3] first described enophthalmos following chronic maxillary atelectasis. Since then various cases have been reported. However, a subgroup of these patients do not have any noticeable nasal or sinus complaints, but present with enophthalmos, diplopia or other ophthalmologic symptoms. This condition of enophthalmos with no other associated symptoms was initially described by Sopakar et al. and named as “silent sinus syndrome” [5]. Ever since various cases have been reported, mainly in the ophthalmologic literature, as patients with silent sinus syndrome usually present initially to the ophthalmologist.

The exact causative pathophysiology is yet elusive. However, various authors [5-9] suggest that the basic mechanism behind this condition is obstruction of the maxillary ostium, causing hypoventilation of the maxillary antrum and atelectasis with negative pressure chronically within the antrum.

Van der Meer et al. [9] suggested various possible aetiological factors of ostial occlusion: 1. Occlussion by thick mucous, 2. Lateralized/hypermobile medial infundibular wall or lateralized middle turbinate, 3. Antral or ostial occlusion by a mucocele or nasal polyp, 4. Inflamed mucosa with or without rhinosinusitis, 5. Hypoplastic maxillary sinus which presents a narrow ostium with tendency of occlusion, 6. Narrow maxillary ostium due to the presence of infraorbital ethmoid Haller cells. According to their opinion the various causative factors lead to respective clinical conditions; therefore, a patient with symptomatic inflammation and rhinosinusitis would present with chronic maxillary atelectasis, whereas patients with more subtle nasal symptoms would present with silent sinus syndrome. Various papers support this correlation between different obstructing factors and different clinical conditions [5,7,10-12].

Several authors have studied the participation of a pressure gradient in the maxillary antrum for the development of loss of orbital support and thus enophthalmos. Experimental data [11,13] is supportive of this theory, although there are no intraoperative data of pressure gradient from the maxillary sinus in silent syndrome patients. Additionally, several articles of the

orthopaedic and orhtodondic literature also support the theory of pressure induced osteopenia [14-16].
It should be noted that in our case the patient was a keen diver. Therefore the pressure gradient between the maxillary antrum and the environmental pressure would be even greater.

In case of floor remodeling, demineralization or loss there are no set guidelines concerning reconstruction. Possible alternatives are either a single stage operation, a two-staged approach, or even no reconstruction. In our case our main therapeutic target was to address the underlying rhinosinusitis. Correction of the enophthalmos was not imperative, due to the absence of any functional ophthalmologic problem. Additionally the patient was not extremely concerned with the aesthetical side of his enophthalmos. Despite great improvement over the last years in techniques and materials, reconstruction with concomitant active infection presents the potential risk of implant extrusion, migration or re-infection.
Therefore, a staged approach was planed. However, post surgical follow up revealed that the affected eye was both functionally normal and aesthetically fully acceptable. Hence, no further treatment was performed. This finding is not unique as various authors report improvement without reconstruction techniques [17-19].

CONCLUSION

Silent sinus syndrome patients present with enophthalmos and are otherwise asymptomatic. The underlying pathology of this condition is chronic maxillary atelectasis and hypoventilation. Therefore, the otorhinolaryngologist must be familiar with this condition, in order to expedite appropriate diagnostic work-up and treatment. Endoscopic maxillary antrostomy is the primary operation, with orbital floor reconstruction in 1 or 2 stages, if indicated.
As mentioned before the exact pathogenetic mechanism is not fully elucidated. However it seems reasonable to assume that our patient`s involvement with sea diving may have contributed in the development of enophthalmos.

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