■ CASE STUDY

The Silent Sinus Syndrome

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The silent sinus syndrome is a very infrequent pathology. It is described as an enophthalmos secondary to collapse and opacification of maxillary sinus without presenting sinus or nasal symptoms. Osteomeatal complex obstruction is the triggering physiopathologic factor. The clinical symptoms and imaging findings lead to the diagnosis. The treatment consists in restoring sinus ventilation and, if necessary, correcting the orbital floor. We report a case of a woman who was diagnosed and treated because of this entity in our hospital.

Key words: Silent sinus syndrome. Maxillary sinus syndrome. Enophthalmos. Hypoglobus. Osteomeatal complex.

Síndrome del seno silente

El síndrome del seno silente es una afección muy poco frecuente. Se describe como un enoftalmos unilateral secundario a colapso y opacificación del seno maxilar sin síntomas nasosinusales. La obstrucción del complejo osteomeatal es el factor fisiopatológico desencadenante. El diagnóstico se basa en los hallazgos clínicos y radiológicos. El tratamiento irá dirigido a restablecer la ventilación del seno y, si es necesario, corregir el suelo orbitario. Presentamos el caso de una mujer diagnosticada y tratada en nuestro hospital por esta entidad.

Palabras clave: Síndrome del seno silente. Atelectasia del seno maxilar. Enoftalmos. Hipoglobo. Complejo osteomeatal.

CASE STUDY

We present the case of a 45-year-old woman, with no relevant medical history, who came to our clinic due to an upper hemi-labial hypoesthesia sensation beginning 2 months beforehand as well as a sensation of her right eye "sinking in" for the previous 3 days. The patient had a history of minor bilateral intermittent nasal obstruction symptoms and slight rhinorrhea.

During the exam a slight enophthalmos of the right eye was observed (Figure 1). In the anterior rhinoscopy a slight septal deviation toward the right side was seen. An unblocked right middle meatus was seen on the nasal endoscopy, without rhinorrhea, as well as an unblocked cavum.

On the sinus x-ray, a mucous thickening of the right maxillary sinus can be seen. The sinonasal CAT scan confirmed the occupation of the right maxillary sinus, with retraction of the upper antral wall (Figure 2).

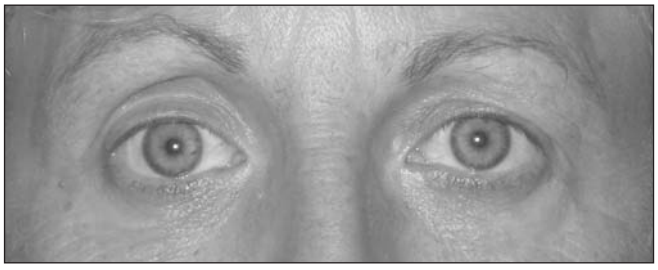

Figure 1. Enophtalmos of the right eye. Retraction of the upper eyelid.

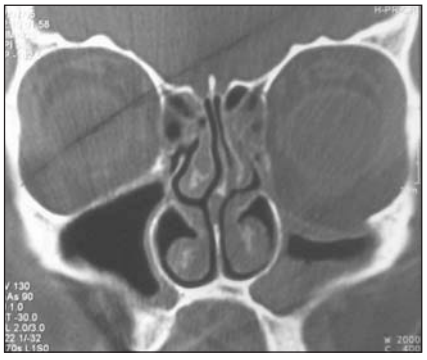

Figure 2. Sinonasal CAT scan. Retraction of the upper antral wall with sinus occupation.

Diagnosed as having a silent sinus syndrome, the patient underwent surgery by a right Caldwell-Luc procedure and lower right meatotomy. A middle meatotomy was not

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performed due to the close contact of the sinus ostium with the orbit.

During surgery, retraction of the maxillary sinus anterior wall was observed. The interior of the maxillary sinus was occupied by mucoid exudate. The absence of the bony wall of the orbital floor as well as the middle wall of the orbit was confirmed.

The biopsies of the sinus mucus showed chronic pseudopolypoid inflammation. Six months after surgery, the lower meatotomy is still permeable and the slight right enophtalmos still remains, but there are no aesthetic problems or diplopia.

DISCUSSION

Silent sinus syndrome is a clinical condition described as an enophtalmos and progressive hypoglobus secondary to gradual collapse of the orbital floor, present with chronic subclinical maxillary sinusitis.[1] It is a very uncommon pathology, with only 84 cases reported since 2005.[2]

In 1964, Montgomery[3] published the first case of opacification of the maxillary sinus and collapse causing enophtalmos.

However, the term silent sinus syndrome was described first by Soparkar et al[1] in 1994 who presented 14 patients with unilateral enophtalmos and hypoglobus with an asymptomatic condition of the maxillary sinus.

Several authors have defined silent sinus syndrome as a subgroup of chronic maxillary atelectasis[4] or as the last stage in the progression of this disease.[5] Atelectasis of the maxillary sinus is defined as a persistent decrease in the volume of the maxillary sinus due to a centripetal retraction of its walls.[5] However, most patients with chronic maxillary atelectasis present nasal and sinonasal symptoms[5] not mentioned by those patients with silent sinus syndrome.[4] This is why Numa et al[2] believe that the silent sinus syndrome has been incorrectly classified during diagnosis of chronic maxillary atelectasis.

The pathogenesis of silent sinus syndrome is uncertain.[6] According to current literature the onset of silent sinus syndrome may be caused by a hypoventilation of the maxillary sinus due to an obstruction of the osteomeatal complex.[2]

With time, that hypoventilation results in a resorption of the closed sinus cavity gases into the capillaries, which creates negative pressure.[2,7] The sinus cavity fills up with an acellular transudate that, over time, is replaced by thick mucus.[7] The process is analogous to what happens in the inner ear of patients with Eustachian tube obstruction.[7]

The result is an accumulation of mucus that sets off a low intensity inflammatory response.[6] The subclinical inflammation will produce osteopenia due to a decrease in the osteoblastic activity caused by bone resorption.[8] The negative pressure also causes bone changes in response to the differential pressure.[7] All of this leads to a retraction and decrease in the sinus volume.[6]

This physiopathology is shared by patients with chronic maxillary atelectasis and those with silent sinus syndrome, but differs in the manner of ostial occlusion.[4] Patients with ostial occlusion due to inflammation and symptomatic rhinosinusitis will be diagnosed with maxillary sinus atelectasis.[4] On the other hand, patients with hypermobility of the medial infundibular wall and without any history of important sinus symptoms will be linked to silent sinus syndrome.[4]

It has been observed that the medial infundibular wall acts as a one-way valve flap,[5,7] so that the unciform apophysis is retracted toward the inferomedial aspect of the orbital wall and produces the maxillary infundibulum obstruction.[6]

However, even though several authors agree with this pathogenesis possibility, it still has not been shown how ostial occlusion happens.[9] Some cases of osteomeatal complex lesion due to nasal intubation[9] or previous sinonasal endoscopic surgery[6] have been described. Some authors argue in favour of the predisposition of patients for developing the condition.[5] In our case, the patient did not present changes at the level of the osteomeatal complex nor any history of instrumentation by way of the nose, which is why we cannot attribute it to any evident cause.

The diagnosis of silent sinus syndrome was based on the clinical and radiological findings.

Silent sinus syndrome is believed to be a gradual and progressive condition, with continuous changes over the course of weeks to months,[2] although some authors have described a more rapid progression. The initial symptom of silent sinus syndrome is a spontaneous enophtalmos[4] due to a downward shift in the orbital content caused by an important thinning or complete resorption of the orbital floor.[9] Sometimes a simple asymmetry can be seen that is caused by an increase the upper orbital sulcus or retraction of the upper eyelid.[10] The shifting of the eyeball vis-à-vis the orbit may cause diplopia from the fact that the upper and lower oblique muscles are being affected, since both are attached to the orbital bone.[2]

These clinical signs are not pathognomonic and a differential diagnosis must be made from chronic sinusitis, malignancies, eye trauma, Wegener's granulomatosis, or sclerosant pseudotumour, systemic disease (scleroderma), and pseudo-ophtalmos.[6]

The typical CAT scan image shows findings of lateral retraction of the fontanelle and medial infundibular wall, retraction of the antral walls and persistent unilateral sinus opacification.[5]

The culture work-ups of the sinus content are negative and are described as chronic inflammation.[4]

Treatment is divided into sinonasal and orbital.[2] The sinonasal part included correction of the ostial occlusion and effective evacuator decompression. Treatment may be done by sinonasal endoscopic surgery with maxillary uncinectomy and antrostomy or by the Cadwell-Luc approach.[2,10]

Reconstruction of the orbital floor may be done by transconjunctival or subciliary methods with placement of an autologous or heterologous graft.[5]

These 2 surgeries may be performed at the same time or in 2 stages.[10] Some recent evidence supports performing the

procedure in 2 stages due to isolated cases of spontaneous resolution of the enophtalmos following ventilation of the maxillary sinus,[2] especially in less severe cases. This indicates that reconstruction of the orbital floor may be avoided. In our case orbital treatment was postponed until a second intervention. After 6 months of follow-ups the enophtalmos is still present but the patient has refused treatment due to the extremely minor aesthetic and functional problems suffered.

In summary, silent sinus syndrome is an uncommon clinical condition that recently has been excluded from being considered as chronic maxillary atelectasis. However, due to its rarity, a consensus has still not been reached among authors. Chronic maxillary atelectasis and silent sinus syndrome share a common physiopathology but the shape of the ostial occlusion and the presence or absence of sinonasal symptoms create a clinical differentiation among the 2. Occlusion of the osteomeatal complex seems to be what sparks this condition even though the causal factor is still unknown. Treatment consists of ostial decompression and reconstruction of the orbital floor may be done during a second procedure if the enophtalmos does not improve.

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