CASE STUDY

Single Surgical Step for Endoscopic Surgery and Orbital Reconstruction of a Silent Sinus Syndrome

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KEYWORDS
Silent sinus syndrome; Maxillary sinus hypoplasia; Enophthalmos

Abstract Silent sinus syndrome (SSS) is an uncommon disease characterised by enophthalmos, caused by ipsilateral maxillary sinus atelectasis. The diagnosis is clinical with radiological confirmation. The treatment has two objectives: to regulate the aeration of the maxillary sinus through achieving normal nasal cavity drainage and to restore the orbital architecture.

A case of SSS treated in our hospital in a single surgical intervention is reported. © 2011 Elsevier España, S.L. All rights reserved.

PALABRAS CLAVE
Síndrome del seno silente; Atelectasia del seno maxilar; Enoftalmos

Síndrome del seno silente: abordaje endoscópico y reconstrucción orbital en un solo tiempo

Resumen El síndrome del seno silente (SSS) es una entidad infrecuente caracterizada por enoftalmos, y provocada por la atelectasia homolateral del seno maxilar. El diagnóstico es clínico con confirmación radiológica. El tratamiento tiene dos objetivos, regularizar la aireación del seno maxilar mediante la normalización del drenaje desde la cavidad nasal y restaurar la arquitectura orbital.

Presentamos un caso de SSS tratado en nuestro hospital en un solo tiempo quirúrgico. © 2011 Elsevier España, S.L. Todos los derechos reservados.

Introduction

Montgomery1 published the first case of opacification of the maxillary sinus in the pre-computed tomography (CT) scan era. However, the term silent sinus syndrome (SSS) was used for the first time by Soparkar et al.2 in 1994 to define an uncommon disease characterised by enophthalmos secondary to ipsilateral atelectasis of the maxillary sinus, even without nasal symptoms.

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Clinical Case

The patient was a 55-year-old woman with a history of breast cancer, who presented with diplopia, ocular discomfort and sinking of the eyeball with lower left eyelid retraction for the past 3 months.

In the examination we found left enophthalmos (3 mm), hypoglobus and restriction in elevation of the left eye with diplopia on upward gaze. Nasal endoscopy revealed left septal deviation and a lateralised middle turbinate.

Sinus CT scan showed a collapsed maxillary sinus, with internal wall retraction, downward displacement of the orbital floor, enlargement of the middle meatus without identification of the middle turbinate and an increase in the retroantral fat pad (Fig. 1).

The patient was operated on under general anaesthesia. We performed an endoscopic middle meatal antrostomy with orbital approach using lateral canthotomy and inferior transconjunctival incision; we then placed a particulate bone allograft harvested from trabecular bone of the lateral tibial plateau and a titanium mesh, fixed to the orbital rim with perforator microscrews.

Three months after surgery, ocular symmetry has been achieved and permeability of the maxillary ostium is maintained (Fig. 2).

Discussion

The physiopathology of SSS was demonstrated by Eto et al.\textsuperscript{1} in 1993; they concluded that enophthalmos stems from remodelling of the bony architecture of the sinus, secondary to its chronic obstructive disease. Complete obstruction induces continued negative pressure within the sinus, which activates the osteoclasts; in turn, these make the sinus walls thinner,\textsuperscript{4} leading to their collapse and the descent of the orbital floor with retraction of its wall. This then produces hypoglobus and pronounced enophthalmos.

Its prevalence is unknown. Some 100 cases have been described in the literature. It typically affects individuals between the third and fifth decade of life, lacking dominance of gender or side; it seems to appear with a lower incidence in smokers.

Characteristic CT findings are lateral retraction of the fontanel and the medial infundibular wall, retraction of antral walls and persistent unilateral sinus opacification.\textsuperscript{5}

Differential diagnosis for this syndrome includes hypoplasia of the maxillary sinus, traumatic sequelae and postoperative changes.

Treatment of SSS has 2 objectives. The first is to regularise maxillary sinus aeration by normalising the drainage from the nasal cavity, while the second is to restore the orbital architecture.

Aerating the maxillary sinus can be achieved endoscopically by creating a nasaotral window. In many cases the orbit recovers its original position by the mere fact of acting on the sinus. Repairing the orbital floor depends on the severity of the diplopia, on the cosmetic alteration and on the postoperative assessment following the sinus surgery step. Different authors indicate that this can be performed simultaneously or in deferred surgery. Some feel that if the enophthalmos progression improves or is detained by the antrostomy, there should be a waiting period of between 2 and 6 months before correcting the orbital floor to permit the maxillary sinus to expand and the enophthalmos to shrink.\textsuperscript{3,5,6} Other authors prefer to avoid a second anaesthesia and hospital stay, given that they feel that the complications associated with these procedures are uncommon.\textsuperscript{7,9} Just as other authors, we consider a single step in patients with diplopia or significant aesthetic deformity.

Recovering orbital aesthetics requires treating 3 abnormalities: the enophthalmos, hypoglobus and deformity of the upper palpebral fissure. Most authors use the subconjunctival approach, but other access routes have been described. We prefer the transconjunctival route associated with canthotomy to avoid aesthetic or scar sequelae. Various materials can be used to reconstruct the orbital floor, including autologous (cranial bone graft) or alloplastic material (polyethylene, hydroxyapatite, stainless steel mesh, silicone, methacrylate, Supramid Teflon and titanium mesh) depending on the defect, the surgeon’s experience and the possibilities of each centre.
Silent sinus syndrome surgery benefits from multidiscipline experience among otolaryngologists, ophthalmologists and maxillofacial surgeons in approaches that are not so common for the otolaryngologist.

Conflict of Interest

The authors declare no conflict of interest.

References