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Case Report

Silent sinus syndrome: A traumatic case

E. Février [a], C. Vandersteen [b], L. Castillo [b], C. Savoldelli [b,*]

[a] Service d'ophtalmologie, hôpital Pasteur 2, CHU de Nice, 06000 Nice, France
[b] Service d'ORL et de chirurgie maxillo-faciale, institut universitaire de la face et du cou, CHU de Nice, 06000 Nice, France

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ABSTRACT

Introduction: Silent sinus syndrome is an unusual cause of progressive enophthalmos and hypoglobus due to atelectasia of the maxillary sinus associated with osteolysis of the orbital floor. This syndrome is classically idiopathic, but the term is also used to describe traumatic or iatrogenic (surgical orbital decompression) cases.
Case report: We report the case of a 33-year-old man who presented with a left orbital trauma without functional disorder. Computed tomography (CT) scan revealed a nondisplaced fracture of the left orbital floor. No surgical indication was made. Three months later, the patient presented with progressive enophthalmos. CT revealed a complete lysis of the left orbital floor and a left maxillary sinus atelectasia.
Discussion: The original nondisplaced fracture of the orbital floor was not responsible for enophthalmos but the associated fracture of the left uncinate process that induced the closure of the left maxillary sinus infundibulum. This induced in turn hypoventilation of the sinus and a left orbital floor lysis. Treatment consisted in surgical opening of the maxillary sinus ostium and reconstruction of the orbital floor.

1. Introduction

Enophthalmos is pathologic posterior displacement of the eyeball within the orbit. The causes are associated with age or are trauma or tumour-related. Post-traumatic enophthalmos is usually diagnosed within the four weeks following the trauma and is the result of a displaced fracture of an orbital wall. A rare form of spontaneous enophthalmos is silent sinus syndrome (SSS), which is caused by hypoventilation of the maxillary sinus at the origin of the atelectasis of its walls, such as the orbital floor. Montgomery [1] described this syndrome for the first time in 1964, but Soparkar [2] coined the term "SSS" in 1994. Even though SSS is idiopathic, it may also be caused by facial trauma without displaced fracture of an orbital wall. We present the case of a patient who presented with post-traumatic SSS enophthalmos.

2. Case report

A 33-year-old man with no history of rhinosinusitis presented with orbital trauma without functional signs. Physical examination revealed a left palpebral bruise with swelling, but without enophthalmos and hypoesthesia, with strictly normal ocular motricity. Scan of the facial bones revealed a nondisplaced fracture of the left orbital floor (Fig. 1). Given the absence of clinical signs and the nondisplaced nature of the fracture, no surgical indication was made. Three months after this trauma, the patient returned with hemifacial asymmetry with left enophthalmos (Fig. 2) and intermittent diplopia. Scan of the facial bones revealed almost complete lysis of the left orbital floor, confirming the diagnosis of secondary SSS (Fig. 3). Given this unfavourable progress, the treatment consisted of reventilation of the left maxillary sinus and reconstruction of the left orbital floor and was performed by two surgeries. From a technical standpoint, the ventilation was performed by left endoscopic middle meatotomy. This opening of the sinuses enabled to visualize a mucous inflammatory tissue (polypoid appearance) without suppuration. Tissue biopsy confirmed the nonspecific inflammatory nature. The left orbital floor was repaired one month after the meatotomy by incision below the eyelashes. The approach revealed almost complete osteolysis of the orbital floor (Fig. 4a). The reconstitution consisted of placing a titanium prosthetic floor covered by an inert polymer (porous polyethylene, DePuy Synthes®) (Fig. 4b). The postoperative recovery with a follow-up of six months revealed stability of the enophthalmos correction (Fig. 5) and the disappearance of all symptoms, in particular the intermittent diplopia.

* Corresponding author.
E-mail address: savoldelli.c@chu-nice.fr (C. Savoldelli).

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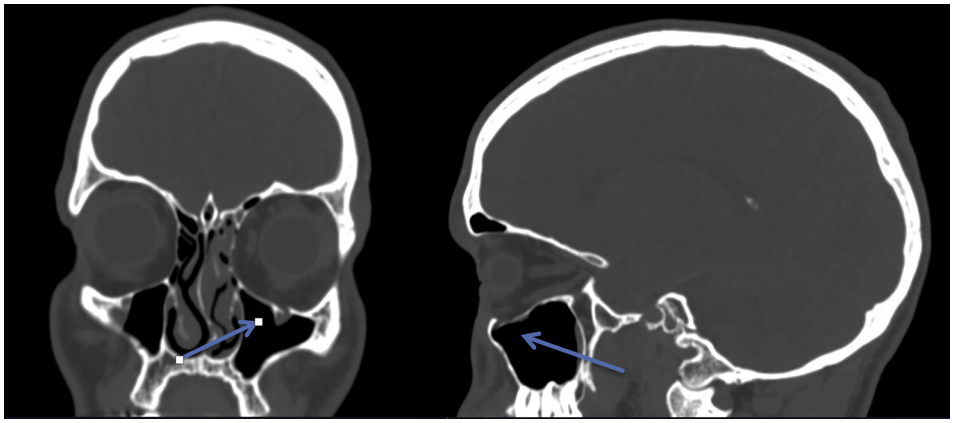

Fig. 1. Nondisplaced fracture of the left orbital floor in coronal and sagittal planes.

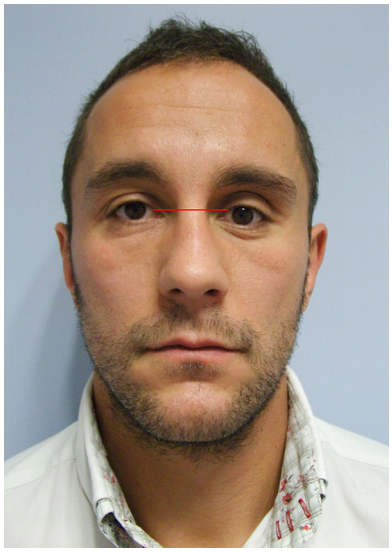

Fig. 2. Enophthalmos and left orbital dystopia three months after facial trauma.

3. Discussion

SSS was diagnosed given the spontaneous occurrence of painless enophthalmos, orbital dystopia and a significant upper palpebral fold as well as the disappearance of the malar area. Ocular motricity and visual acuity are usually not affected, even though diplopia may occur. The diagnostic criteria of idiopathic SSS include the absence of chronic rhinosinusitis, the absence of acute rhinosinusitis in the past six months, the radiologic proof of a modification of the orbital floor, no history of orbital trauma or enophthalmos and no sinus or orbital congenital malformation [3]. Unlike idiopathic SSS, secondary SSS, which is rarer, is classified into two categories: post-traumatic or iatrogenic (orbital decompression of dysthyroid orbitopathy). Other extremely rare forms have been reported [4]. Primary or idiopathic SSS appears progressively over an average of three to eight months [3]. Secondary SSS is very rare and occurs between two months and 30 years after facial traumas or surgeries for orbital floor decompression [5]. The clinical diagnosis is confirmed by an orbital scan showing a depression of the orbital floor with inferior convexity. The maxillary sinus is most often partially or fully filled by a low-density tissue, and the nasal septum is displaced toward the affected maxillary sinus in 70% of the cases [3]. In SSS, the maxillary infundibulum is occluded by a collapse of the (uncinate) process onto the inferomedial orbital floor. This apposition acts like a unidirectional valve, leading to negative pressure into the maxillary sinus and causing its atelectasis (Fig. 6). The aim of the treatment is to regulate the ventilation of the maxillary sinus and to restore the natural architecture of the maxillary sinus. Various materials may be used to restore the orbital floor (autologous bone grafts or heterologous materials) and are chosen based on the extent of the osteolysis and on the surgeon's practices. Irrespective of the origin of the SSS, the treatment options are correction of diplopia by prism use alone, isolated middle meatotomy [6], middle meatotomy and reconstruction of the orbital floor in one surgical step, or middle meatotomy and reconstruction of the

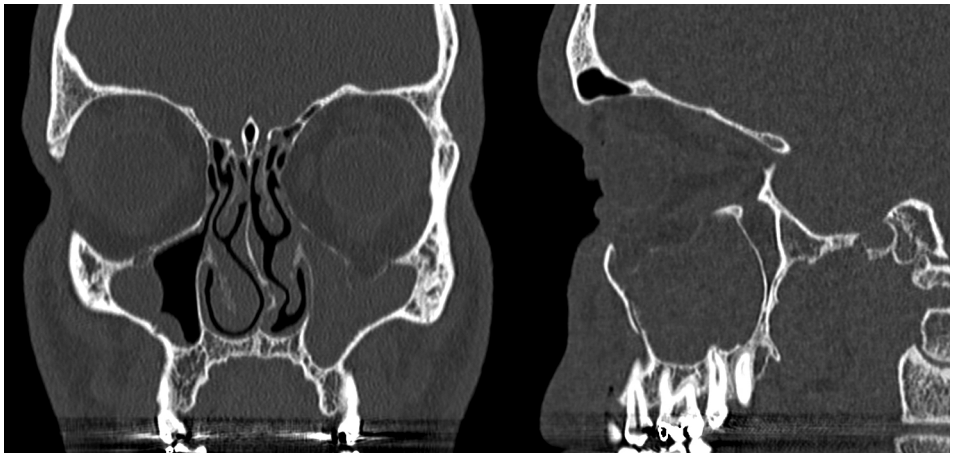

Fig. 3. Almost complete lysis of the left orbital floor in coronal and sagittal planes.