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Case Report

The silent sinus syndrome

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ABSTRACT

The silent sinus syndrome (SSS) involves painless facial asymmetry and enophthalmos, which is the result of chronic maxillary sinus atelectasis. In most cases, it is diagnosed clinically, however, using the characteristic imaging features including maxillary sinus outlet obstruction, sinus opacification, and sinus volume loss caused by inward retraction of the sinus walls. Obstruction of the maxillary ostium appears to play a critical role in the development of SSS. Treatment involves functional endoscopic surgery.

Key Words: Enophthalmos, hypoplasia, maxillary sinus, syndrome

INTRODUCTION

Silent sinus syndrome (SSS) is usually noticed unilateral disorder affecting the maxillary sinus, and is found among people at the age of 30-60, with no gender distinction.[1] The SSS, also known as imploding antrum and chronic maxillary sinus atelectasis, is recognized by painless enophthalmos and inward retraction of the ipsilateral maxillary sinus walls on imaging studies.[2] Orbital enlargement and enophthalmos leads in volume loss in the maxillary sinus. The hypoplastic maxillary sinus and SSS are not clearly distinct by imaging. There have been numerous cases, which were primarily offered in the otolaryngology and ophthalmology literature,[3-10] However, it has rarely been presented in the radiologic literatures, therefore, many radiologists are not even familiar with the syndrome and the helpful radiologic features. The syndrome is diagnosed by clinical features; however, it must be confirmed by radiologic characteristic imaging.[11]

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CASE REPORT

Cone beam computed tomography was obtained from a 60-year-old female in order to assess implant insertion sites. In clinical examination, a mild facial asymmetry was detected and deviation of nasal septum to the left was apparent [Figures 1 and 2]. In regard to medical history, the patient was completely asymptomatic, with normal visual acuity, unaffected extraocular movements, no diplopia, and no obvious rhinitis. The patient reported recurrent and frequent sinusitis along with the difficulty in breathing during the last 5 years. Nasal septum deviation was diagnosed by an otolaryngologist as the main cause of the respiratory problem of the patient. The patient had no facial trauma, systemic infection, cranial malformation, or tumor. Computed tomography performed in the axial, sagittal, and coronal planes revealed a hypoplastic opacified left maxillary sinus with thinning and depression of the orbital floor and posterolateral sinus wall. The uncinate process appeared lateralized and adherent to the lamina papyracea, blocking the osteomeatal complex drainage [Figures 3-5].

DISCUSSION

The SSS is a spontaneous unilateral maxillary atelectasis with complete or partial opacification

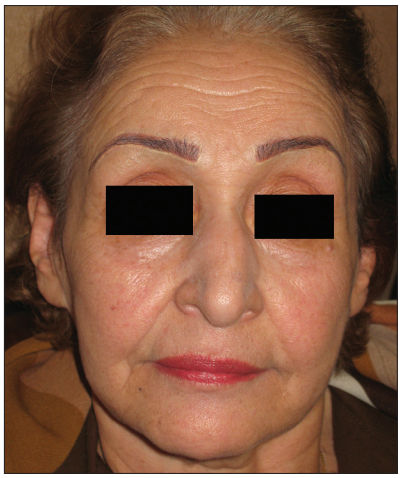

Figure 1: A mild facial asymmetry and deviation of nasal septum to the left side

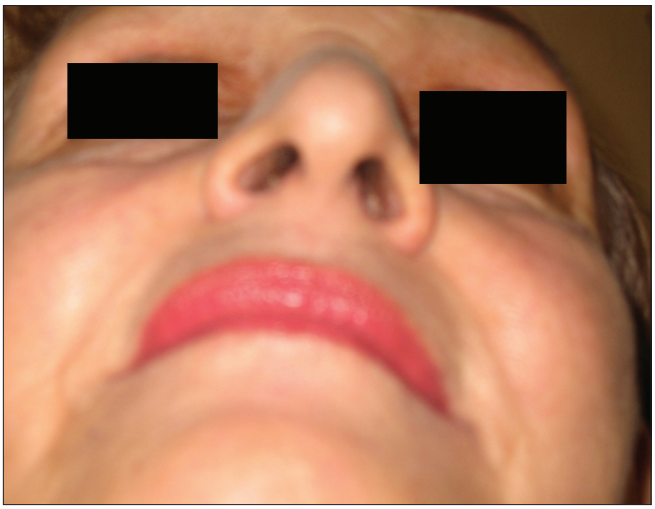

Figure 2: Deviation of nasal septum to the left side

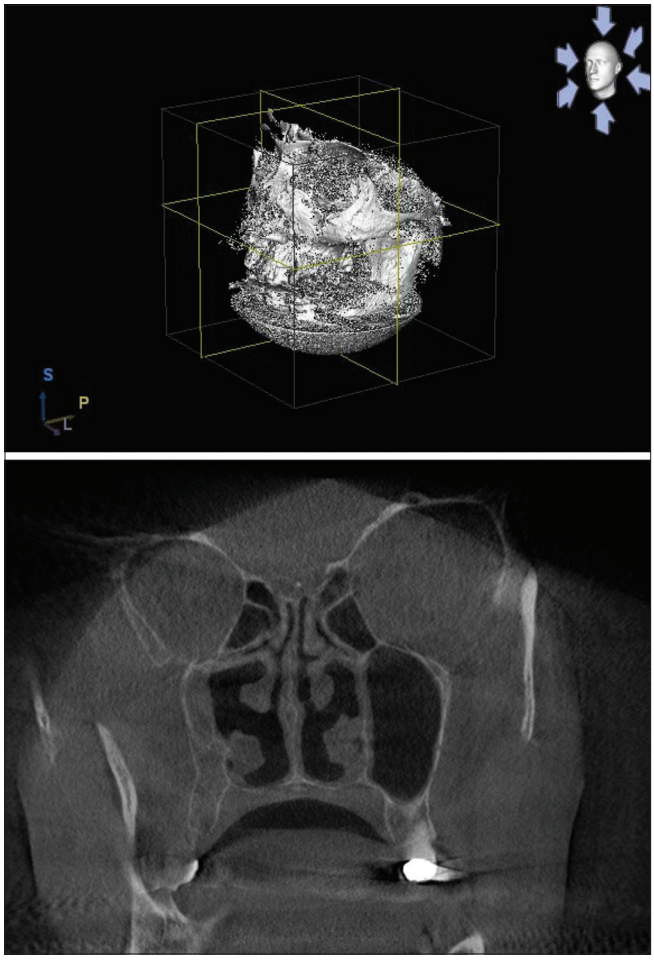

Figure 3: Coronal view of cone beam computed tomograph of the parasinuses demonstrate completely opacified and atelectatic maxillary sinus with inward bowing of all of the right maxillary sinus walls; increased right orbital volume with enophthalmos

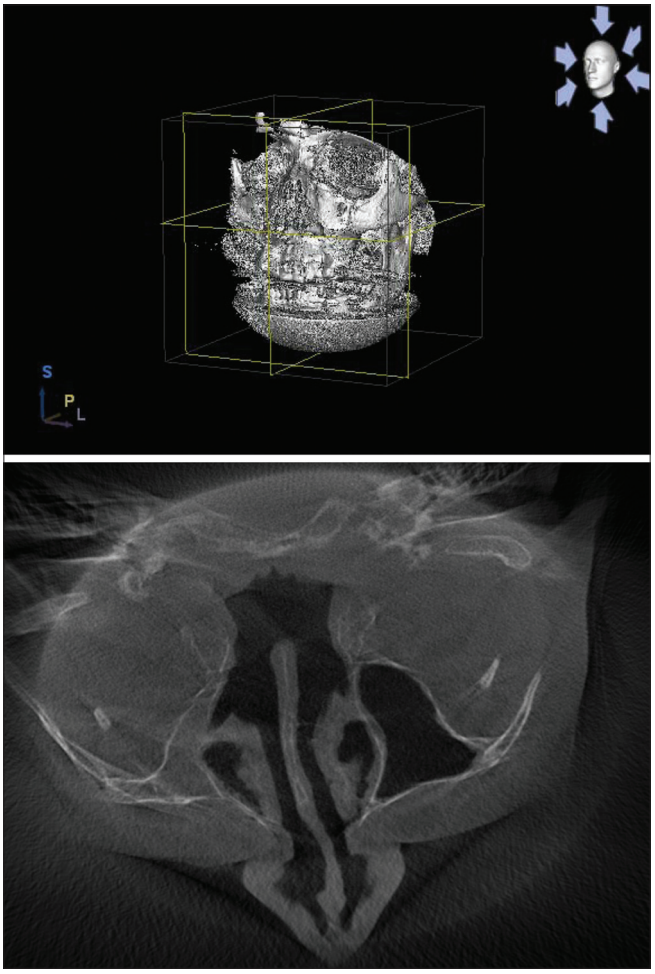

Figure 4: Axial view of cone beam computed tomograph. Deviated nasal septum; mild mucosal thickening of multiple ethmoid air cells bilaterally; enlarged middle meatus with lateral retraction of the middle turbinate

of the sinus, and also an uncommon disorder, although, due to lack of recognition, many cases have not been reported.[12] A 30-60 years old adult presenting spontaneous, painless, and occasionally

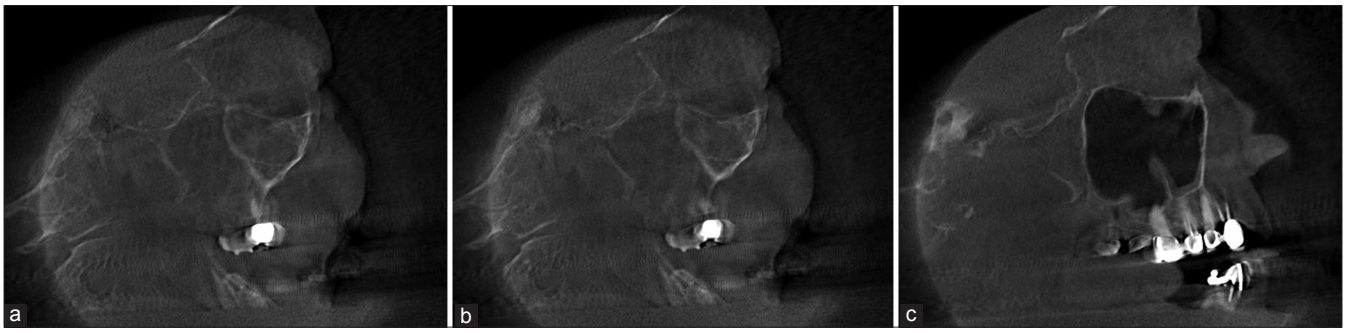

Figure 5: (a-c) Sagittal view of cone beam computed tomograph illustrating the inward bowing of all of the right maxillary sinus walls

progressive enophthalmos and hypoglobus is considered as a typical patient with SSS.[12,13] Rose, *et al*., reported about 14 patients suffering from SSS who all had 1-4 mm enophthalmos and up to 4 mm hypoglobus.[13] Sánchez-Dalmau, *et al*., and Montserrat Borràs Perera, *et al*. had reported some cases with SSS, presenting enophthalmos and hypoglobus.[14,15]

The present patients are at the age range of 26-74 years old, with a mean of 40.3 years, with no differences between two sinus sides. Moreover, it has not been confirmed that gender, profession, smoking, alcohol or heredity are related to SSS.[16] The symptoms are not shown to be related to chronic sinonasal disease. The followings may be noticed while physical examination: Upper lid retraction, deepened upper lid sulcus, malar depression, facial asymmetry, and diplopia. What is found by imaging is the helpful characteristic; the primary one is maxillary sinus volume loss due to inward retraction of the sinus walls, which is the main reason for the increased orbital volume and enlargement of the middle meatus. It is the typical case to have all four sinus walls retracted, however, one of the medial, anterior, or posterolateral walls may be excluded. There is always retracted and usually thinned orbital floor (maxillary floor). The other walls may be thinned, normal, or slightly thickened. Illner *et al*. reported a study conducted on five patients with SSS, among them, three patients showed inward retraction of all four sinus walls (roof, anterior, medial, and posterolateral) into the sinus. All of them showed increased orbital volume on the affected side, which was due to downward retraction of the sinus roof (orbital floor) into the maxillary sinus.[11] The maxillary infundibulum is always occluded and the sinus is opacified. The uncinate process is retracted against the inferomedial aspect of the orbital wall.[2]

Despite several proposed theories, absolute pathophysiological development of SSS is not specified. The most acceptable theory is that the complete obstruction of the ostium is the main reason of the prolonged negative pressure in the maxillary sinus, which leads in hypoventilation and the accumulation of secretions. The gas resorption causes negative pressure, which in its turn may lead in osteopenia, bone remodeling, and sinus wall retraction. The result is thinner orbital floor, which fails to support the orbital content, with expansion into the sinus and resulting in enophthalmos.[1] It is crucial to diagnose SSS correctly, as different conditions causing spontaneous enophthalmos require different treatment and prognosis. Tumor, trauma, congenital facial asymmetry, diffuse facial lipodystrophy, Parry-Romberg syndrome, and linear scleroderma are common sources of an incorrect diagnosis of SSS.[17]

The treatment is done to restore a normal ventilation of the maxillary sinus and the normal position of the ocular globe.[14] A procedure called the CaldwelleLuc, was common in the past. Today, the gold standard treatment to restore sinus function and preserving the maxillary structures is functional endoscopic surgery with uncinectomy and antrostomy.[1] The orbital floor reconstruction is controversial. There are reports of considering it as a second-stage operation, which is commonly done 2 months after the sinus surgery, due to complete or partial resolution of the enophthalmos, with over-correction in the case of immediate orbital floor reconstruction resulting from the resolution of the hypoventilation and restoration of the normal intra-sinus pressure. It is also noticeable that in cases with sever enophthalmos, reconstruction of the orbital floor is inevitable and morbidity, patient discomfort, and hospitalization can be reduced by a single-stage operation. Due to negative sinus

cultures in most cases, by performing primary reconstruction, there would be no risk of infection.[18]

CONCLUSION

Since the complications of SSS such as upper lid retraction, malar depression, facial asymmetry, diplopia, and enophthalmos can be prevented by timely diagnosis and dentist may be the first specialist encounters radiographies of these patients, so it seems to be important to introduce this rare syndrome for dentists.

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