Bilateral maxillary sinus hypoplasia: nasal mucosa swelling developing from periapical periodontitis

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Abstract

Maxillary sinus hypoplasia is a relatively rare condition and opportunities to encounter this pathology are scarce. We describe a bilateral case in a 64-year-old woman with swelling of the nasal floor mucosa resulting from periapical periodontitis in the condition of maxillary sinus hypoplasia, similar to the swelling of the sinus membrane in the condition of normal anatomical structure.

Introduction

Maxillary sinus hypoplasia (MSH; underdevelopment) and maxillary sinus aplasia (MSA; failure to develop at all) are relatively rare conditions. Bilateral cases are much rarer than ipsilateral cases for both pathologies[1]. The overall prevalence of MSH has been reported as 1.5-10.0%, but some studies have reported values below this range[2]. These conditions are not particularly well known among dentists and oral surgeons. When reading an orthopantomogram, clinicians are not necessarily considering the possibility of MSH/MSA or of conditions resulting from such aberrant structures. We encountered a rare case of MSH associated with periapical discomfort at the right maxillary first molar. Computed tomography showed resorption of the nasal floor and thickening of the corresponding nasal mucosa due to periapical periodontitis, similar to the swelling of the sinus membrane observed in maxillary sinusitis. We provide an outline of this case herein.

Case Report

A 64-year-old woman presented to a primary care dental office for a regular check-up, and described discomfort in the right maxilla that had improved gradually over time. No obvious abnormalities were apparent on extra- and intra-oral visual examinations, and no pain was elicited by percussion of the relevant teeth. An orthopantomogram showed a small area of periapical radiolucency at the right maxillary first molar (Fig. 1), and the abnormal maxillary sinus was not prominent. For precise examination, cone-beam computed tomography (CBCT) was then performed. The very large nasal cavity expanded to the lateral wall of the maxilla (Fig. 2) and bilateral maxillary sinuses appeared profoundly hypoplastic and located posterosuperiorly (Fig. 3). The root apex of the right maxillary first molar was located not just under the maxillary sinus, but also under the nasal floor, where the cortical bone had been resorbed, and the corresponding mucosa was thickened. The inferior turbinates on both sides were normal in size. No lacrimation disorders were observed. The patient had no history of either surgery or facial

trauma, nor of any systemic disease affecting the skeletal system. No other craniofacial anomalies were apparent. The ethmoid and sphenoid sinuses were rudimentary.

Symptoms improved spontaneously over time and no interventions have been performed, as the patient did not request treatment. Information about the condition was provided to the patient and no intervention is planned in the absence of acute recurrence of symptoms.

Discussion

No definitive etiology of MSH/MSA has been identified, although various congenital and acquired contributors have been suggested[3]. Clinically, this condition itself is not an indication for surgical treatment. Thin cortical bone at the nasal floor will drive early expansion of inflammatory lesions around the apex of a tooth root. Thickening of the nasal mucosa over the root apex rather than maxillary sinus is one representative finding. Without CBCT, correct diagnosis is difficult without an awareness of this morbidity.

In the treatment of thickening of the nasal mucosa, we support a periapical periodontal approach, rather than an otolaryngological approach, even if the main symptomatic region lies within the nasal cavity, because the cause of onset is almost invariably a tooth. In this case, we left the cause untreated in accordance with wishes of the patient and will continue observation for recurrent symptoms.

Anatomical structures may govern force transmission and pressure distributions, and normal structures typically act as a shock absorber in avoiding life-threatening injuries from events such as traffic accidents. However, in patients with MSH/MSA, unexpected and serious results may arise with the impairment of this safety mechanism. We also believe that under conditions of MSH/MSA, surgical interventions that make use of ordinary maxillary properties for the establishment of functional occlusion, such as sinus lift, are not necessarily indicated for implant insertion. Furthermore, in cases with this structure requiring Le Fort I osteotomy to improve jaw deformity, the direction and range of movement will be restricted for reliable bone

healing from the perspective of bone contact at the osteotomy line. Therefore, MSH/MSA is not a condition which needs surgical treatment, but a condition which needs some attention.

Conflict of Interest

We have no conflicts of interest to declare.

Ethics Statement/Confirmation of Patients' Permission

The patient provided consent for the publication of information relating to her case.

Legends

Fig. 1

An orthopantomogram shows periodontitis of the right maxillary first molar (arrow). A cavity structure resembling the maxillary sinus is observed over the roots. Correctly determining that this cavity represents the nasal cavity is difficult at this point.

Fig. 2

CT shows hypoplasia of bilateral maxillary sinuses (arrow) with a very large nasal cavity. The sinuses are located higher than they generally would be. Cortical bone at the root apex of the right maxillary first molar has been resorbed and the corresponding mucosa on the floor of the nasal cavity is thickened (arrowhead).

Fig. 3

Natural ostia with deformed uncinate process (arrow) are seen on both sides. Small maxillary sinuses are located posterosuperiorly (arrowhead).

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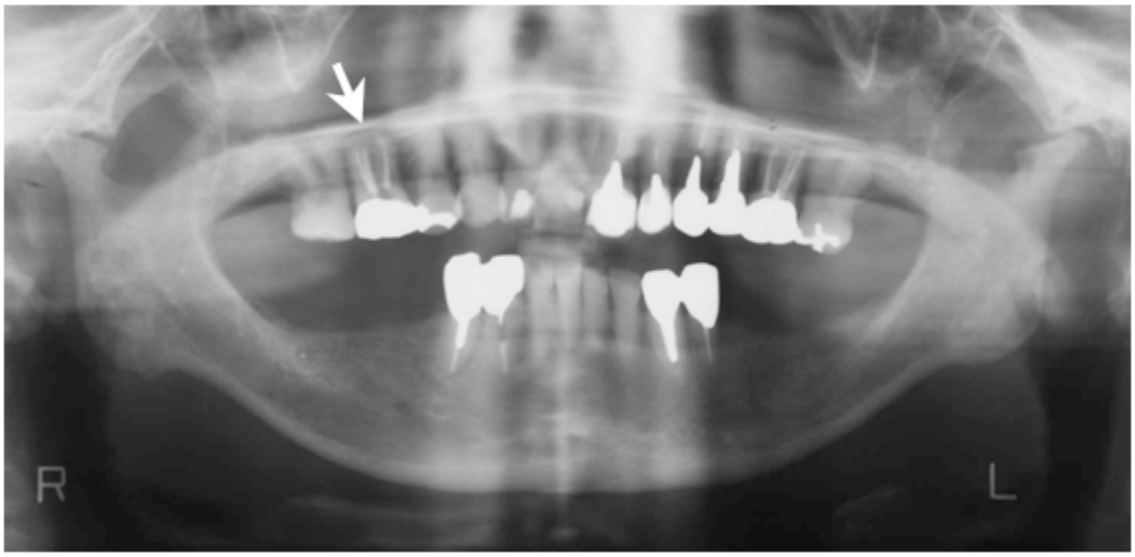
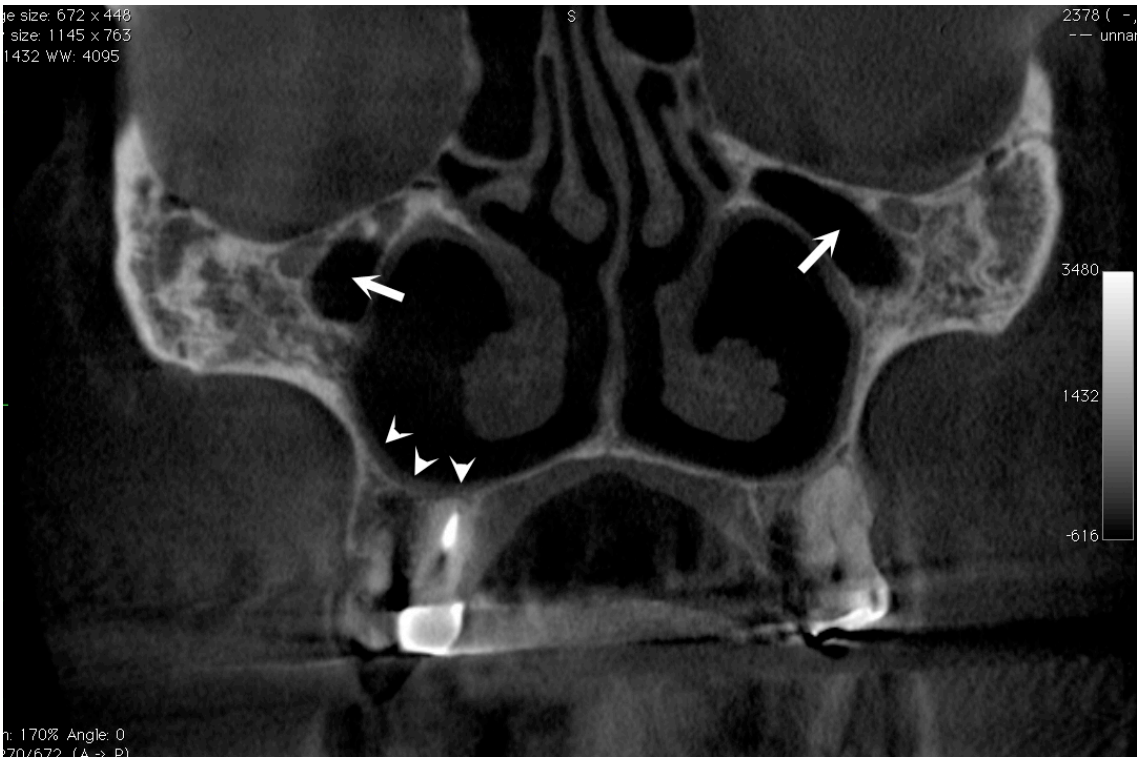


Fig. 1

Fig. 2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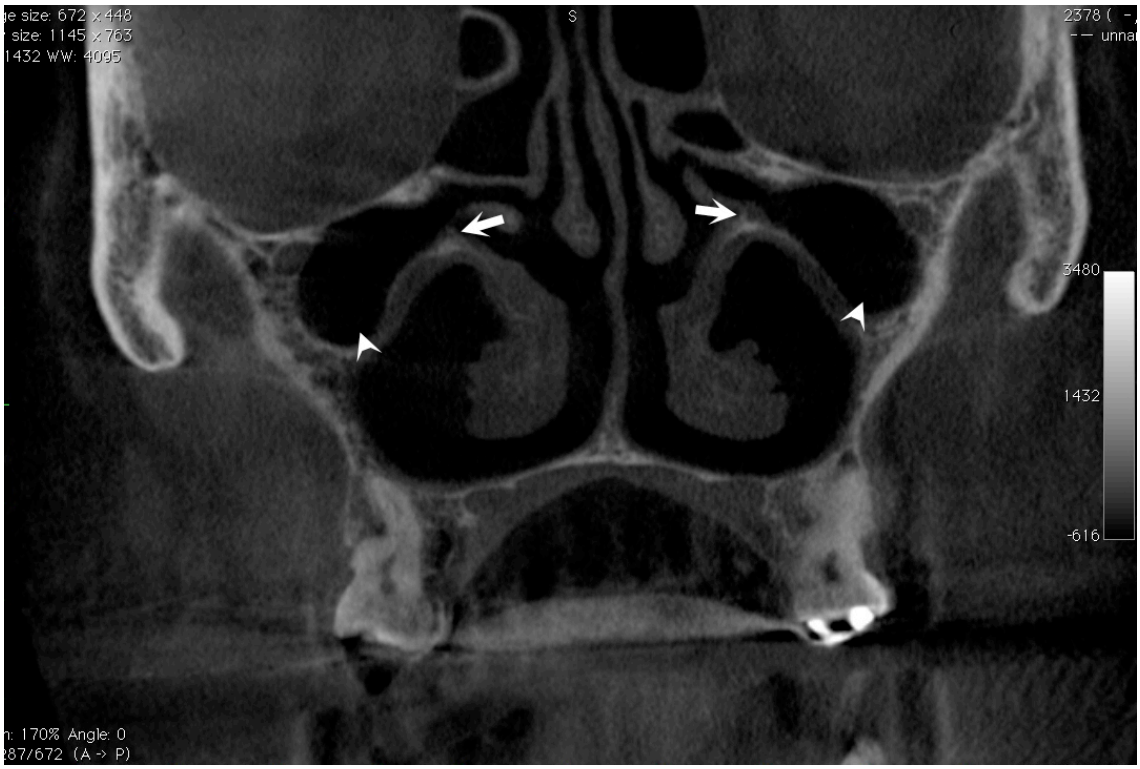

Fig. 3