



Case report

A dental implant dislocated in the ethmoidal sinus: A case report

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ABSTRACT

Maxillary sinusitis can represent a rare complication of dental implants of endodontic materials impinging in the maxillary sinuses. The effects of anatomical variants of paranasal sinuses on pathophysiological and clinical manifestations of dental sinusitis are poorly understood. Herein, we present a case of dislocation of a dental implant in the ethmoidal sinus in a 63-years old man with bilateral accessory maxillary orifice. This anatomical variation, by providing an additional way for the drainage of mucus in the maxillary sinus, could have allowed the dislocation of the implant in the ethmoidal sinus without causing mucus stagnation and consequent sinusitis, leading to a unusual clinical presentation. .

1. Introduction

Anatomical variants of paranasal sinuses could have a relevant impact on pathophysiology and clinical manifestation of rhinosinusitis. Among these variants, the presence of an accessory maxillary ostium (AMO) has been described both in healthy human subjects and in patients with chronic rhinosinusitis [1]. Maxillary sinusitis can be a complication of dental implants and endodontic materials impinging on the maxillary sinus, even though these represent rare conditions [2]. In some cases, endodontic materials can be entirely displaced into the maxillary sinus, obstructing the maxillary ostium and causing sinusitis [3]. However, to our knowledge, the effects of anatomical variations of paranasal sinuses on dental implant dislocation have never been described. We report an unusual case of dental implant dislocation in a patient with bilateral AMO. Due to this anatomical variation, the patient lacked of some classical symptoms of sinusitis, presenting instead with unusual clinical symptoms.

2. Case report

A 63-years-old man was referred to the Department of Otorhinolaryngology for posterior rhinorrhea, a sense of heaviness in the right maxillary sinus and cacosmia. These symptoms started after an oral dental surgery performed 20 days previously, to place an osseointegrated dental implant in the 1.5 upper right molar. The patient did not report headache or any other symptoms suggestive of maxillary sinusitis related to implant dislocation. The patient gave informed, written consent for all the diagnostic and therapeutic procedures, and for the publication of the case report. Clinical examination, carried out under endoscopic 30° (Karl Storz) view, did not disclose either acute sinusitis, or purulent secretion coming out from the middle meatus, or nasal polyps, or oroantral communication. Considering the disabling symptoms and the progressive worsening, a 3D Cone-Beam Computed Tomography scan (CBCT) was then performed, showing a 10 × 5 mm radiolucency dental implant displaced in the right ethmoidal infundibulum, associated with a mucus retention cyst in the right maxillary sinus and mucosal hyperplasia in the floor of the left maxillary sinus (Figure 1). A functional endoscopic sinusal surgical (FESS) removal of the implant was performed under local

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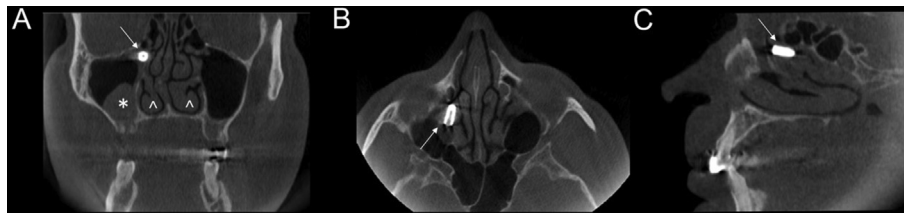


Figure 1. Cone Beam Computed Tomography images in coronal (A), axial (B) and sagittal (C) sections showed the implant (arrow), located at the ethmoidal infundibulum level of the right maxillary sinus. A mucus retention cyst was visible in the right maxillary sinus (asterisk). Notice the asymmetry of inferior turbinates (arrow heads), probably due to compensatory hypertrophy after the right septal deviation.

anesthesia, using a 30 degree Karl Storz® endoscope with Image One Karl Storz® Camera. Specifically, after removing the horizontal part of the uncinata process with a wide opening of the maxillary sinus, the implant was removed. At the end of the operation, an absorbable oxidized cellulose gauze (Gelitacel®) was applied in the middle meatus without additional nasal packing. The patient was discharged the following day with antibiotic treatment (Amoxicillin/Clavulanate 825 mg/125 mg, 2/day for 6 days). After 3 days, the patient did not report any further symptoms.

3. Discussion and conclusions

In the present report, we describe a case of odontogenic sinusitis following displacement of a dental implant, in a patient with bilateral AMO. The presence of AMO is not a rare condition: it has been described in approximately 10–20% of healthy patients, and in 30% of patients with chronic maxillary sinusitis [4, 5]. It is still unknown if AMO represents a congenital anatomical variation or rather an acquired condition. It has been suggested that it could originate after episodes of acute sinusitis [6]. In our patient, bilateral AMO was associated with a right maxillary mucus retention cyst, and mucosal hyperplasia on the floor of the left maxillary sinus (Figure 2). These findings are in keeping with the results of a recent retrospective study, that reported an approximate threefold increase in incidence of mucus retention cysts and a nearly twofold increase in incidence of mucosal hyperplasia in patients with AMO [1]. Despite their relatively high frequency, the effects of AMO on the pathophysiology and clinical manifestation of sinusitis are poorly understood. This is particularly true for odontogenic sinusitis resulting from dislocation of dental implant, as they represent a relatively rare cause of sinusitis. In a longitudinal study of 70 patients with implants perforating the sinus, none had evidence of sinusitis after an average review period of 10 years [3]. In other cases of dental implant displacement (such as that depicted in Figure 3), the dental implant would have been carried to the mucociliary system towards the ostium of maxillary sinus, resulting in obstruction and subsequent sinusitis. The presence of sinusitis, in turn, would have compromised the correct function of the mucociliary system and its

function of ciliary transport and biofilm creation. In the present case, it is possible to hypothesize that the presence of an accessory orifice would have allowed for the secretions to be drained out, preventing the manifestation of a radiological and clinical picture of sinusitis. The absence of a marked inflammatory reaction allowed the mucociliary system to maintain its efficiency, trapping and carrying out the implant at the ethmoidal infundibulum level, despite its high weight and dimension. Unfortunately the implant was too big to be expelled, unlike other reported cases [7], so that the “defense-process” had not been completed.

On the other hand, in the present case the absence of complete sinus obstruction would have caused the patient to report milder symptoms, compared to other cases of sinusitis. The cardinal symptoms of acute rhinosinusitis are i) purulent nasal discharge (anterior and/or posterior); ii) nasal obstruction/congestion; iii) facial pain/pressure/fullness in the anterior face, periorbital region or headache [8]. In a review of 33 cases of odontogenic sinusitis, the clinical features commonly found were sinus pain, postnasal drip, congestion and maxillary toothache [9, 10]. Our patient reported relatively few symptoms of classical sinusitis, with the exception of posterior rhinorrhoea. Other important symptoms such as headache, congestion and maxillary toothache were also absent; in addition, anosmia has been reported, probably as a consequence of the vicinity of dental implant to the olfactory nerve.

In conclusion, we would suggest considering a possible dental implant dislocation even without clear rhinosinusitis symptoms, since there could be anatomic variants that may avoid the collection of mucus in the sinus. Finally, we also suggest performing a 3D CT scan in all cases after a dental implantation, in order to disclose the correct placement of the implant and to look for anatomic variants of the sinus in slightly symptomatic patients. In our experience, it is relatively common to find displaced implants located in the maxillary floor associated with a sinusitis picture, especially if the mucociliary system is altered because of inflammation, leading to a unilateral pansinusitis. On the other hand, the clinician should keep in mind that relatively common anatomical variants of paranasal sinuses, such as AMO, could alter the underlying pathophysiology, leading to unusual clinical presentation.

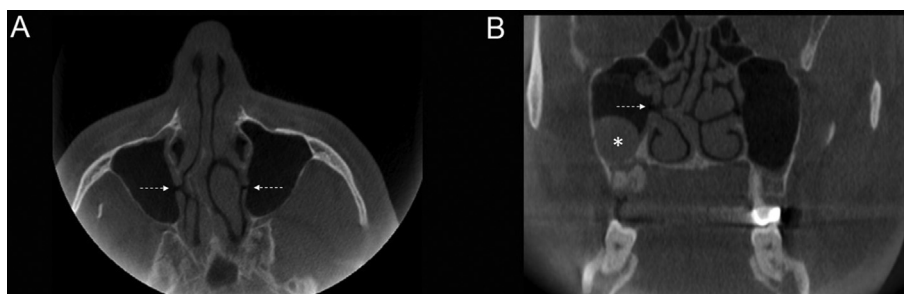


Figure 2. Cone Beam Computed Tomography images in axial (A) and coronal (B) sections showed bilateral, symmetrical accessory orifices of the maxillary sinuses (dotted arrows). The asterisk marks a mucus retention cyst located in the right maxillary sinus. Some degrees of mucosal hyperplasia are appreciable in the left sinus.

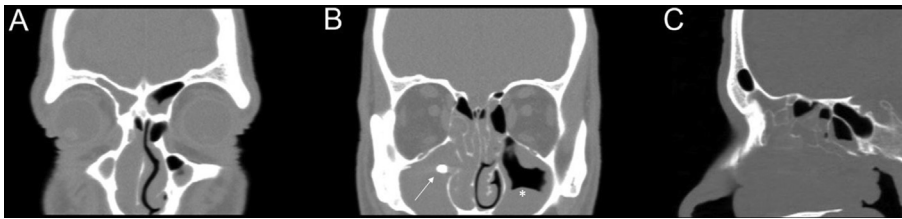


Figure 3. A paradigmatic case of monolateral pansinusitis after dislocation of a dental implant in the maxillary sinus (arrow). The images were collected from another patient in our clinic. Cone Beam Computed Tomography images in coronal sections (A, B) and sagittal (C) sections. In absence of an accessory orifice, the obstruction causes a monolateral sinusitis with complete opacification of maxillary, ethmoidal and frontal sinuses, contralateral mucosal hyperplasia (white asterisk) and presence of polypoid tissue in the ethmoidal and frontal sinuses.

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Author contribution statement

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Additional information

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