Dental Bur into the Maxillary Sinus: A Case Report

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Abstract

Inserting a foreign body into an anatomical structure is a rare situation in which the maxillary sinus is most commonly involved. The latter results in developing sinusitis or, more rarely an asymptomatic situation. The present case report describes an event in which a dental bur was found into the right maxillary sinus of a female patient, because of an event that took place while extracting a molar. Grafting material was also found except for the dental bur. The dental bur and grafting material were removed by performing a 'Caldwell-Luc' surgery, the patient was covered with antibiotics and the therapeutic effects were quite satisfactory. The report discusses the possible causes of the event and the possible therapeutic approaches.

Key Words: Foreign object, Maxillary sinus, Dental bur, Caldwell-Luc

Introduction

The insertion of foreign bodies into various anatomical structures in everyday dental practice is a rare event and an unwanted situation. The most commonly involved anatomical sites are nasal cavities, the pharynx, the maxillary sinus, the ethmoid nasal cavity, the lungs, the gastrointestinal system, the submandibular canal and the canal of the inferior alveolar nerve [1-6]. The insertion of foreign bodies in the anatomical sites mentioned above can be the result of an accident, in case of children, the elderly, mentally retarded people and alcoholics. In these cases, the accident is attributed to the patients' willingness to hurt themselves, such as in the case of prisoners and psychiatric patients, or is due to iatrogenic causes [1,4].

The insertion of a foreign object into the maxillary sinus can be attributed to an accident (25%) or can happen accidentally (60%). The latter can take place as a consequence of a bad dental operation. The maxillary sinus is the anatomical site that is involved more often (75%), followed by the frontal sinus (18%) [1]. The iatrogenic insertion of a foreign object into the maxillary sinus can be reported after root canal treatment, because of forwarding residual apex or a whole impacted tooth or a dental implant, as a result of hard and unsuitable handling, wrong therapeutic planning or lack of surgical experience. Even dental impression material has been found inside the maxillary sinus [2,4,5,7,8].

In the majority of cases, an oroantral communication is being established [4]. Consequently, the insertion of a foreign body into the maxillary sinus is either followed by the absence of symptoms, or can be the cause of chronic sinusitis [6]. The treatment of such situations includes full removal of the foreign body and trauma restoration, after providing the patient with antibiotics. The most frequent removal techniques are endoscopic surgery with endonasal or oral antrostomy and Caldwell-Luc method [6,9].

Case Report

A 55-year old female patient came to our clinic, indicating that a foreign body should be removed from her right maxillary sinus. The patient reported that she had her upper right first molar (#16) surgically extracted 15 days ago, together with a direct implant placement. The clinician, after placing the implant, informed the patient that she had to return some days later so as to remove a screw that was located into the maxillary sinus.

Figure 1. *A panoramic X-ray revealed the existence of a foreign elongated metallic-finish body.*

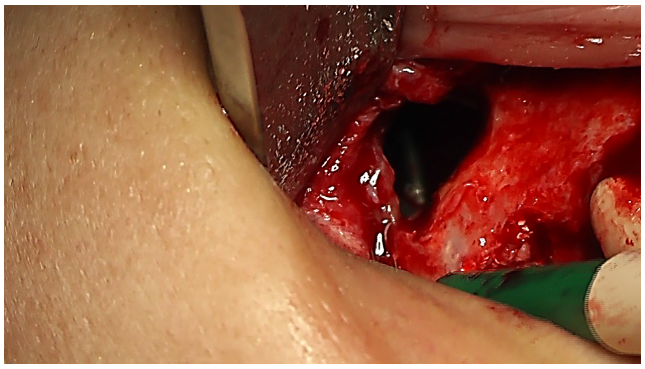

Figure 2. *Surgical bur was found.*

A panoramic X-ray revealed the existence of a foreign elongated metallic-finish body in the area of the right maxillary sinus, in contact with an implant in the place of tooth #16 (*Figure 1*). As it was shown in the CBCT, in the coronal sections, in the region of the right maxillary sinus, radiopaque material was also found between the foreign body and the implant. Under local anesthesia, Caldwell-Luc surgery was performed and a surgical bur was found, whose length was 2.5 cm (*Figures 2 and 3*).

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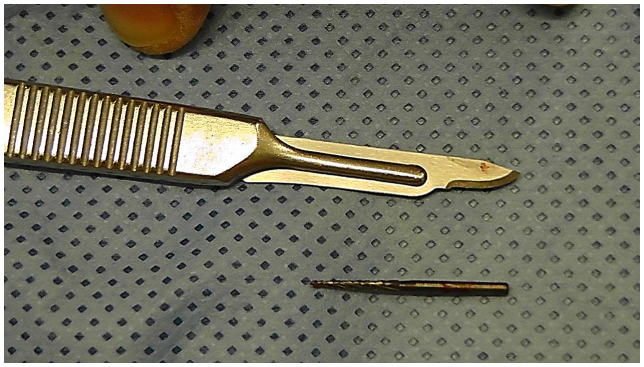

Figure 3. *Caldwell-Luc surgery*

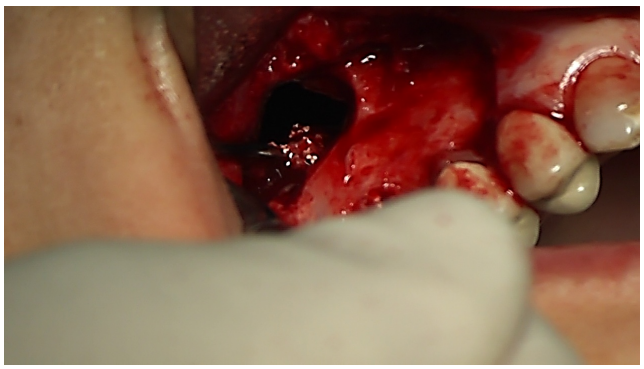

Figure 4. *Grafting material removal.*

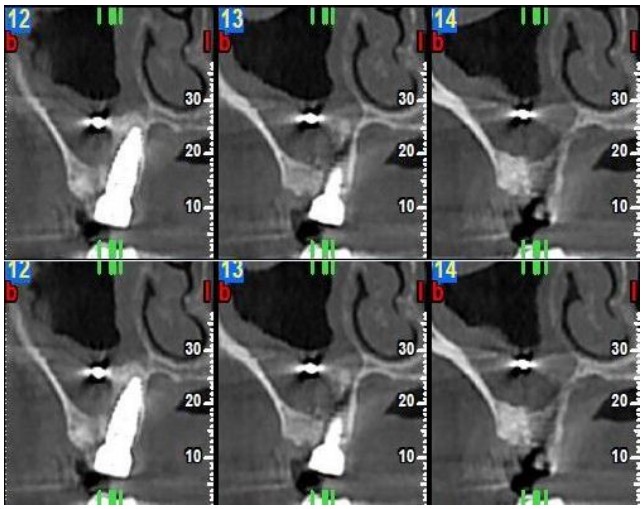

Figure 5. *Surgical bur was found, whose length was 2.5 cm.*

Moreover, a large quantity of grains (granules) of grafting material was removed, (*Figures 4 and 5*), which obviously was placed into the alveolar of the tooth. The patient was administered with Augmentin 625 mg × 3. The wound healing was very good without any complications.

Discussion

Inserting medical tools and particularly surgical reamer into the maxillary sinus is rare. In the international literature, there are reported totally five cases similar to the above, in which, a dental bur was found into the maxillary sinus. Three of these cases were identified in the English literature, while the other two in the Japanese literature.

All of them were burs of dental handpieces, three of which were the reason for the development of sinusitis. Mostly, these cases occurred during tooth extractions, while in one case the cause and the way of forwarding the bur has not been clarified yet [10-15]. *Table 1* presents the cases found in the English literature.

Table 1. *Cases of forwarding dental burs*

Cases of forwarding dental burs into the maxillary sinus (English literature)			
Case	**Cause**	**Symptoms**	**Method of removal**
Abe et al. [12]	Extraction of molar (#26)	Pain, edema, unable to smoke	Through the alveolar socket (with forceps)
Abe et al. [12]	Extraction of molar (#16) - unclear	None	Caldwell - Luc
Smith and Emko [15]	Extraction of premolar (#14)	None	Caldwell - Luc
Voss et al. [16]	Extraction of molar (#16)	Acute mid-facial pain	Combined transconjunctival and transnasal
Kalyvas and Kapsalas (present)	Extraction of molar (#16)	None	Caldwell - Luc

In our case, the most likely explanation is the incomplete retention of the bur due to damage of the handpiece, or due to a bad restraint mechanism; thereby, the bur was ejected, during rotation, through one of the roots of the molar and entered the sinus.

The creation of oroantral communication was obvious because during the intervention, except for removing the dental bur, graft-stent material was also removed. We should also note that there was no reason for removal of the implant, which was placed in the palatal root of tooth #16, since there was very good initial stability and the tissues around it had healed well.

Additionally, among the reasons that led to the above-mentioned case, we should highlight the possible damage to the dental hand piece and to the retaining mechanism of the bur or the bur itself, which the clinician ignored or did not realize.

The removal of foreign bodies from the maxillary sinus can be performed endoscopically or by the classic method of the Caldwell-Luc access. The advantages of endoscopic removal of foreign bodies are obvious. This method is less invasive and non-traumatic for the other tissues, ensures decreased associated morbidity, decreased risk of tooth root injury and also full visual contact with the maxillary sinus. This method is more suitable for the removal of foreign objects located anteriorly in the sinus [2,15].

Caldwell-Luc is the most invasive approach, but it is the most suitable method for the removal of large foreign bodies and also for cases in which the foreign body is located

posteriorly or inferiorly in the sinus. This method ensures direct visual contact with the maxillary sinus. As discussed earlier even dental impression material has been found inside the maxillary sinus [2,15,17].

In our case, the dental bur was removed by using the latter method (Caldwell-Luc), due to the size of the foreign body and also in order to ensure that grafting material was fully removed.

It also has to be mentioned that the dentist informed the patient that there were some complications following the surgical procedure of the positioning of the implant and the graft-stent material into the chamber. In our opinion, informing the patient should have been done immediately after the event; the dentist should have discussed this with the patient to decide whether the implant and the graft-stent material should have been positioned.

Conflict of Interest

The authors have stated explicitly that there are no conflicts of interest in connection with this article.

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