

Removal of dental surgical bur from maxillary sinus: a case report

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The most commonly performed surgical procedure in Oral and Maxillofacial Surgery practices are the removal of impacted third molars. Extensive training, skill and experience allow this procedure to be performed in an atraumatic approach. The aim of this study was to drawing attention to the importance of the correct management of the complications cases of foreign body inside maxillary sinus after surgical removal of maxillary third molars. This is an unusual clinical case of a dental surgical bur accidentally displacement into the maxillary sinus during an upper third molar extraction surgery. After removal, the clinical case showed a satisfactory repair emphasizing the importance of a meticulous clinical examination to achieve a correct diagnosis and an appropriate treatment plan, which is essential for a favorable prognosis.

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Introduction

The surgical removal of impacted maxillary third molars is a procedure routinely carried out by Oral and Maxillofacial Surgeons and it is usually associated with low rates of complications and morbidity¹. However, iatrogenic displacement of foreign bodies into the buccal space, infratemporal fossa, maxillary sinus, lateral pharyngeal space, pterygomandibular space, as well as, tissue planes is a possible complications and have been reported in the literature²⁻⁴.

Foreign bodies vary in size and shape and range from endodontic instruments, burs, posts, root copings, teeth, dental roots, orthodontic brackets, and impression materials to temporaries, dental implant and restorations⁵. Sometimes, it is possible to minimize the risk of inhalation/ingestion or displacement of the foreign bodies by using a rubber dam in a routine basis⁵. Nevertheless, there are situations in which the use of a rubber dam may not be feasible, such as treatment in Oral Maxillofacial Surgery.

Some objects are made of materials that lack radiopacity, which makes it impossible to identify their position. Thus for an accurate diagnosis, a three-dimensional computed tomography (CT) reconstruction, routine CT and chest x-ray examination can be used in order to allows simultaneous visualization of an operative site and the surgical instruments⁴⁻⁵.

Although the dislocation of upper third molar into maxillary sinus has often been mentioned in the literature^{2,6-9}, just a few cases about displacement of the surgical bur during oral surgeries has been reported⁷. Dislocation of the surgical bur during oral surgeries can result in complications, such as infection, bleeding, nerve injuries and when it goes inside the sinus, may lead to serious complications including maxillary sinusitis and an oroantral fistula³⁻⁴. Thus, the surgical removal is strongly recommended and the correct interpretation of history, physical examination and radiographic evidence are necessary to achieve an early diagnosis⁶⁻⁷. Therefore, the aim of this case report is to present the removal a surgical bur from the maxillary sinus.

Case Presentation

A 33-years-old woman was referred to the Clinics of Fapes (*Fundação de apoio a pesquisa e estudo na área de saúde, São Paulo, SP, Brazil*) for detailed examination of the left maxilla with complaint of the presence of dental instrument accidentally displaced into the maxillary sinus. According to the patient's history, she underwent an oral surgery in a private dental clinic in order to remove a maxillary left third molar and after seven days, she had first noticed pain and swelling in the left side of her face and headaches. Three month after the procedure, she visited otorhinolaryngologist for treatment, who observed a presence of dental instrument inside of the maxillary left sinus in the panoramic radiographic (Figure 1). The diagnosis was sinusitis and presence of metallic foreign body inside of maxillary sinus. The patient was referred to the clinic (Fapes) to removal the instrument.

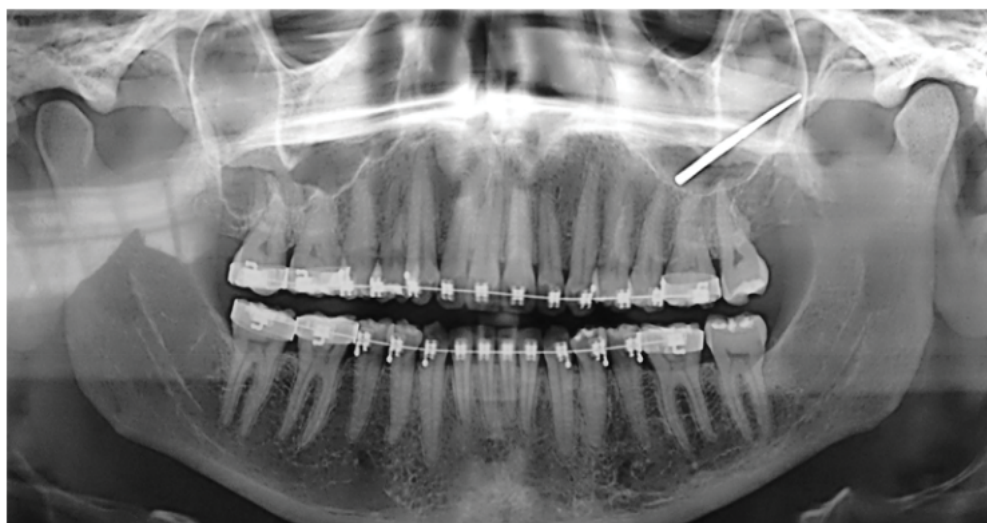


Figure 1. Panoramic radiographic showing the presence of surgical drill inside the left maxillary sinus after left upper third molar removal surgery.

On extra oral clinical examination revealed edema in the left side of her face and she complained of pain and presented symptoms of sinusitis. The computed tomography examination was requested to clarify the localization of the instrument.

After antibiotic therapy with oral antibiotics (500mg Amoxicillin + 125mg Clavulanate, every 8 hours for 7 days) was prescribed for acute sinusitis. Surgical procedures were performed under local block anesthesia (posterior superior alveolar nerve, greater palatine nerve and buccal infiltration from the canine to the first molar) with infiltration of local anesthetic solution 4% articaine hydrochloride with 1:200,000 epinephrine (Nova DFL[®] Rio de Janeiro - Brazil).

The surgical drill was removed through Caldwell-Luc procedure. A vestibular incision was made from the first premolar to the second molar region and a full-thickness mucoperiosteal flap is reflected to expose the bone. Using a round bur under saline irrigation, a bone window over 4-5 mm in diameter is made distal to the apex of the first premolar and above the apices of the molars region over 5 mm to access a maxillary sinus. The membrane was elevated from the bone first and then with a straight metal suction tip going from the bone window directly to the posterior sinus, where the surgical drill was usually located and removed when the patient is supine position (Figure 2a). A membrane (Lumina coat[®], Criteria, São Carlos, Brazil) was placed against to bone window and was folded over. Then flap was repositioned and standard suture techniques were utilized for wound closure (Figure 2b and Figure 2c) using a nylon sutures (Ethicon, Johnson & Johnson[®]; São José dos Campos – Brazil). The post-operative medication included antibiotics (875mg Amoxicillin + 125mg Clavulanate, every 12 hours for 7 days) and anti-inflammatory (400mg Ibuprofen, every 6 hours for three days).

A soft diet was recommended, sneezing and nose blowing must be avoided and a post-operative panoramic radiographic was required. Sutures are removed at 10 days

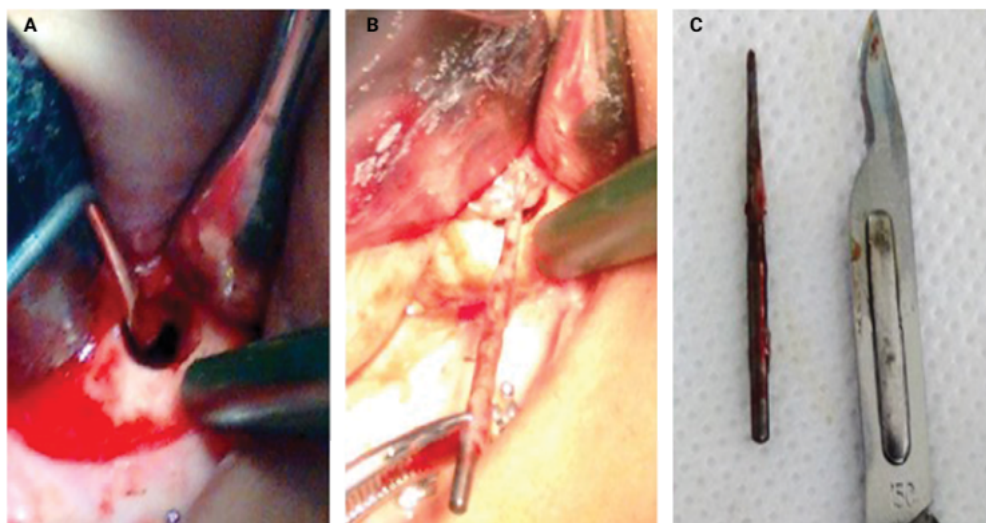


Figure 2. Bone window and membrane elevation to remove the surgical bur. Patient is in the supine position (a); straight metal suction tip through the hole (bone window) can suck the bur out with powerful suction pressure easily, because the bur will drop into the bottom of the sinus when the patient is in the supine position (b). Surgical bur removal (c).

and the patient was seen at 1 day, 1 week, and 7 weeks after the operation and checked for swelling, pain, numbness, nasal discharge and bleeding.

Discussion

Although accidental displacement of foreign bodies inside of the maxillary sinus is a frequent complication in dental practice, surgical burs displacement is not common. The outcome ranges to unique complications including sinusitis and foreign body reactions, so they must be removed^{3,10}.

One report described foreign bodies in paranasal sinuses and enter the maxillary sinus through an oroantral fistula⁹, while another noted delayed retrieval of a displaced maxillary third molar from infratemporal space⁸. At the literature, some studies described the displacement of teeth, dental implants and dental material inside to the maxillary sinus^{2,8,9} and the treatment associated with Caldwell-Luc or endoscopic surgical procedure, although most papers did not describe in detail the application of the Caldwell-Luc procedure to removal a surgical bur.

In the present case report, panoramic radiography performed after upper third molar extraction surgery showed dislocation of the surgical bur into the maxillary sinus. Furthermore, the patient presented edema in the left side of her face, pain in the left posterior maxilla region, headaches and symptoms of sinusitis. Therefore, the removal of displaced surgical drill from the maxillary sinus was performed soon as possible, in order to minimize the complications.

Several techniques are available to remove a foreign body, depending on its size and location. An intraoral approach with creation of a window in the anterior lateral wall of the maxillary sinus by making a window just below the canine fossa and the ante-

rior wall is breached, described as the Caldwell-Luc technique^{11,12}, and a transnasal approach for functional endoscopic sinus surgery can be used¹³⁻¹⁵. Endoscopy procedure has the advantage of a small bone window and with good visualization. Thus, the foreign body can be removed. However, endoscopy is performed under general anesthesia and requires the admission of the patient.

In the present case, the surgical drill was removed by the classic Caldwell-Luc approach^{13,15}. This technique is similar to the operation used to explore disease in the sinus but we do not need to remove the sinus membrane completely. The diagnostic phase and careful evaluation of the radiograph is needed to confirm the type of foreign body, the size, location and whether is mobile or not. It is important to emphasize, the dentist should be familiar with this procedure and able to handle this complication.

In conclusion, the prevention through the use of all the required precautions during dental procedures is the best approach to avoid accidental displacement of a surgical bur into the maxillary sinus. In case of displacement of any object, it is essential a good clinical evaluation, followed by foreign body localization and the appropriated treatment. In this case report, the standardized diagnostic procedure and Caldwell-Luc approach for removal of displaced surgical bur from the maxillary sinus showed a safe procedure, simple and fast without any complications.

Conflict of interest

The authors declare that they have no conflict of interest.

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