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Iatrogenic fracture of the maxillary tuberosity – a case report

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Abstract

The article presents a case of an iatrogenic maxillary tuberosity fracture due to poor actions of the dentist during an attempt of extracting upper third molar.

Key words: extraction of upper third molar tooth, fracture of the maxillary tuberosity complication after third molar extraction

Introduction

In the last decades there is a massive growth of impacted third molars' number. The extraction of those teeth should be more often performed by oral surgeons, because of the severity of such procedure. [1, 2].

Performing of any surgical procedure bears the risk of complications. Third molars are usually highly volatile in aspects of their shape and size, and their extraction in the maxilla can cause the communication between the oral cavity and maxillary sinus, forcing the roots or even whole tooth to the sinus, fracturing the alveolar process or the maxillary tuberosity. Factors that can promote the maxillary tuberosity fracture could be: widely spread roots, hyoercementosis, ankylosis, atypical number of roots, infused teeth, chronic periapical inflammation, big sinuses with thin walls [3], and also substantial pneumatisation of the tuberosity and low descending sinus' recess [4, 5]. Fracture of maxillary tuberosity can occur during the extraction of upper third molar performed with forceps [5], and also during the use of luxator with too much force [4]. Such actions are called iatrogenic and very adverse for the patient [6].

The maxillary tuberosity plays an important role in stabilisation and retention of the prosthetic dentures, allows proper prosthetic rehabilitation, thus its fracture constitutes a very significant prosthetic problem.

The aim of the study was to present a case of maxillary tuberosity and alveolar process fracture, which occurred after iatrogenic actions of a dentist during an attempt of extracting left upper third molar.

The patient was referred to the Oral Surgery Department of Medical University of Lodz by an outpatient oral surgery clinic and simultaneously after a consultation in the outpatient

laryngological clinic, where the first aid was provided, in the form of anterior tamponade of the nose due to massive epistaxis. The epistaxis occurred after the attempt of removing the partially impacted upper lest third molar in a private practice. Initiating the extraction caused the fracture of the maxillary tuberosity along with a part of alveolar process up to the region of tooth 24, extracted many years before. The medical interview showed that the patient suffers from hypertension, coronary disease and type II diabetes. The clinical examination showed patient's good general condition and oedema of the left cheek. Diagnosis of maxillary tuberosity fracture was conducted basing on the clinical and radiological examination. The patient provided the postero-anterior maxillary sinus radiograph [Fig. 1], which showed left maxillary sinus to be totally opaque, which was caused by the presence of blood. The OPG showed the fracture line from the maxillary tuberosity to the region of tooth 24 (Fig. 2). Intraoral examination showed the fracture of the crown of tooth 28 without disrupting the continuity of the mucosa, haematoma located from the tuberosity region up to vestibular mucosa in the region of tooth 23, and also a haematoma of the buccal mucosa around 4 to 5 cm in diameter.

The haematoma was also discovered on the palatal mucosa of the left side, covering the half of the palate, from the region of tooth 22 up to the palatal arch and the border of the soft and hard palate. After removal of the tamponade, the presence of blood was discovered in the left nasal meatus. The motility of the maxillary tuberosity was palpable along the fracture line on the maxillary alveolar process, during the attempt of seating the forceps on the crown of root 28 and applying vestibular pressure. The patient reported that during the first attempt of extraction, he reported twice the occurrence of very strong pain in the intra-orbital and maxillary tuberosity area.

Due to massive trauma and the haematoma of the soft tissues, and also forming of the indirect fragments in a case of immediate extraction of the tooth, the procedure has been postponed. The fractured fragment of the maxillary bone including the impacted tooth, have been left for spontaneous healing.

The surgical extraction of the tooth was planed after three months from the sustained trauma, in accordance with the treatment schedule proposed by Hadziabdic et alia [12]. The palatal plate has been used for immobilisation. Also the antibiotics have been administered: amoxicillin with clavulanic acid – Augmentin 1,0, 1 tablet every 12 hours for 10 days, Metronidazole 0,25, 2 tablets every 8 hours for 4 days, Aescin 3 tablets 3 times a day, cold

compress, Sulfathiazole in a form of nasal drops, also Ketoprofen 0,1 1 tablet every 12 hours. Six weeks after the fracture the patient was referred for laryngological consultation and the CT of the maxilla was performed which result showed superiorly elevated periosteum, depositing a layer of new bone in the region of third molar on the left side, with no possible way of ruling out the inflammation [Fig. 3].

The laryngologist, due to the suspected inflammation administered Biotaxin in injections for 3 days. After applied pharmacotherapy, significant improvement was obtained. Second CT of the sinuses showed thickening of antral mucosa in the alveolar recess of the left maxillary sinus, of the size of 5 x 4 x 3 mm (Fig. 4).

After three months from the trauma a control OPG has been performed (Fig. 5), which showed remodelling of the bone in the region above the upper left impacted third molar.

The treatment plan was presented to the patient, taking into consideration possible complications and after obtaining signed consent, the surgery was scheduled. In local anesthesia a trapeze periosteal flap was cut and prepared in the vestibule of oral cavity. After removing a minimal amount of bone in the region of upper left third molar and dissecting the roots, the tooth was removed. No oro-antral communication was observed. The wound was sutured. The follow up visit the next day revealed very small oedema of the operated area. The patient reported no pain and the postoperative course was uneventful. In the described case, extracting of the tooth after three months from sustained trauma has been efficient. Maxillary tuberosity has been preserved, which was the best possible result of the treatment and our final goal.

Discussion

The fracture of maxillary tuberosity, which can occur during extraction of upper molars, constitutes a major surgical and prosthetic problem. It is very important to create conditions as favourable as possible for healing the bone fracture.

Maxillary tuberosity fracture usually is accompanied by the oro-antral communication. The choice of treatment is dependent on the severity of the trauma and the condition of the tissues surrounding the fracture fragment [7, 8]. Such fracture can be complete or partial. With regard to the size of the fractured bone fragment three degrees of fracture can be distinguished:

1. Mild/small tuberosity fracture (along the extracted molar a small portion of the adherent bone fragment of the tuberosity adjacent to the root is attached).
2. Moderate/medium tuberosity fracture (along the extracted molar a greater part of the adherent tuberosity is attached, covering the area adjacent to the root, but also wider).
3. Severe/ catastrophic tuberosity *fracture* (the fracture line entails a great part of the tuberosity and the adjacent tissue pterygoid plate, blood vessels and muscles) [9]

Maxillary tuberosity fracture with concomitant preservation of the soft tissues and periosteum integrity encourages delicate extraction of the tooth, and fractured tuberosity does not require the reposition and immobilization. In the 2 to 4 weeks usually the bone is healed [5].

In case of small bone fragments, the best solution is to remove them [4, 10].

According to Bartkowski, if maxillary tuberosity fracture occurs, after performing the trapeze periosteal flap, the tooth should be extracted, wound sutured and the fragments immobilised by palatal plate or dental splint. [4]. According to Hadziabdic et alia, sufficient for obtaining the healing is to immobilise it in the best and easiest way, by suturing the wound and subsequently extracting the tooth from the bone fragment after three months [12].

Ngeow believes that the stabilisation of the fractured maxillary tuberosity, along with the embedded tooth, can be obtained by applying the forceps and then separating the bone from the tooth with a luxator [11].

Routine treatment of such condition is its stabilisation for 4 to 6 weeks. After this time the extraction can be resumed [3, 12]. If the tooth is painful or the odontogenic infection results, most authors believe that the tooth cannot be left and it should be extracted with as small amount of bone as possible. If such attempt fails, the fragment of the bone should be removed along with the tooth. After 4 to 6 weeks from the surgery, it is possible to transplant the lacking bone [13, 14, 15]. If there are no visible signs of infection, the removed fragment of bone can be used as autogenous transplant.

When tuberosity fracture occurs with disrupting part of the mucosa, there is usually significant bleeding from the wound and open sinus. In such situation after controlling the condition of the sinus and its mucosa, the oro-antral communication closure is performed [4].

In conclusion, there is no doubt that the maxillary tuberosity plays an important role in stabilisations of the prosthetic appliance and its fracture is a very rare, yet significant problem for the surgeon and subsequently for the prosthodontists. The patients need to be informed of it.

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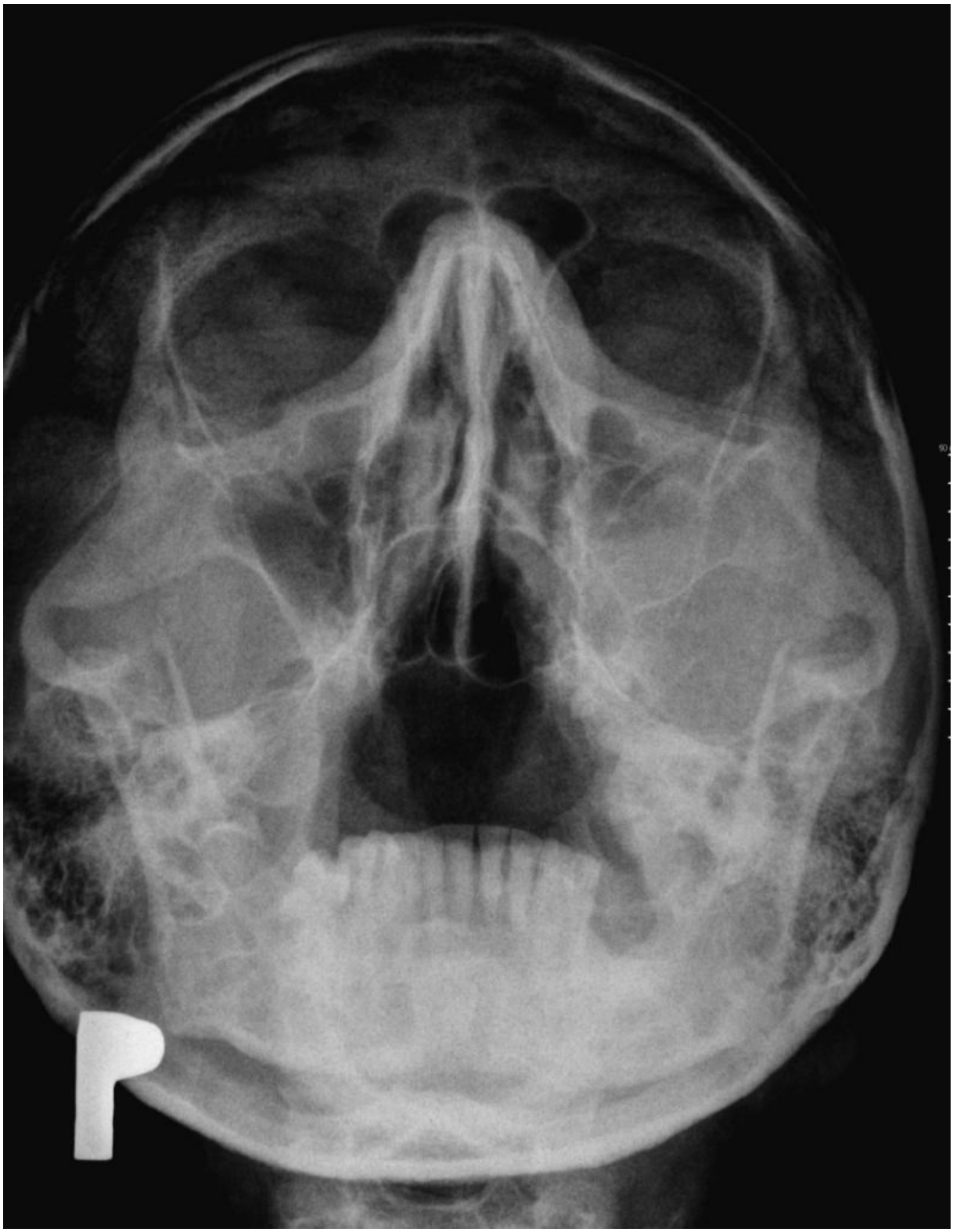
Fig. 1. Postero-anterior maxillary sinus' radiograph.

Fig. 2. OPG showing the line of fracture.

Fig. 3. CT of the maxilla, showing superiorly elevated periosteum, depositing a layer of new bone in the region of third molar on the left side, with a hint of the inflammation.

Fig. 4. CT of the paranasal sinuses, showing visible thickening of the sinus' mucosa in the alveolar recess of the left maxillary sinus.

Fig. 5. OPG showing visible remodelling of the bone in the region above the upper left impacted third molar.



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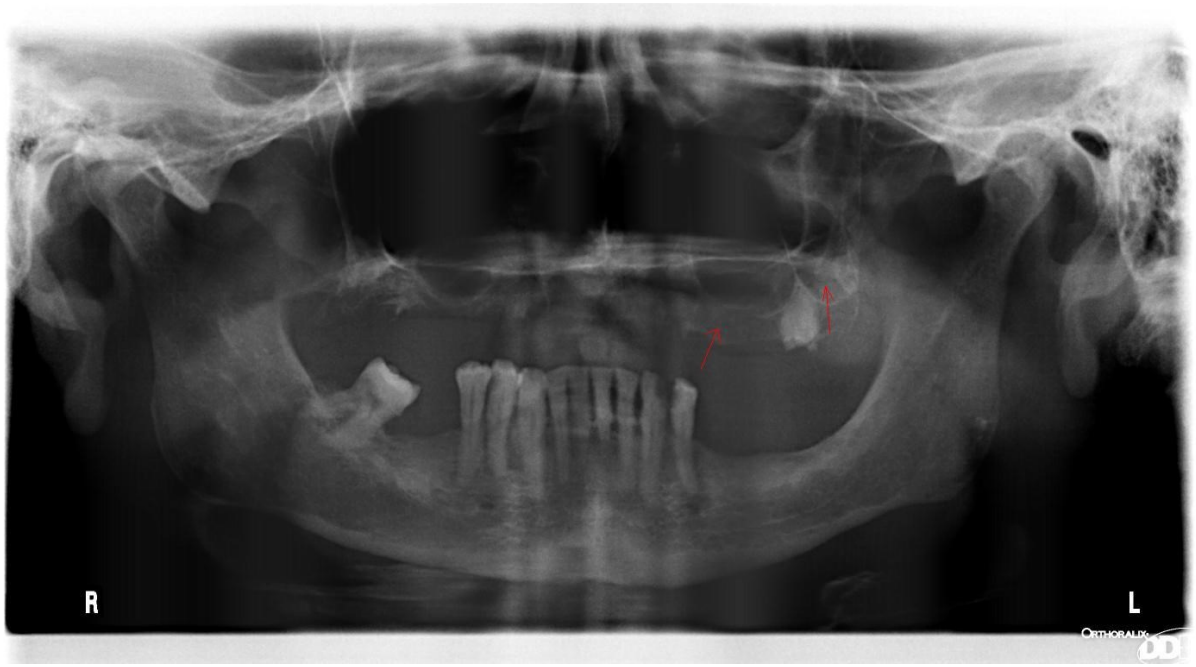

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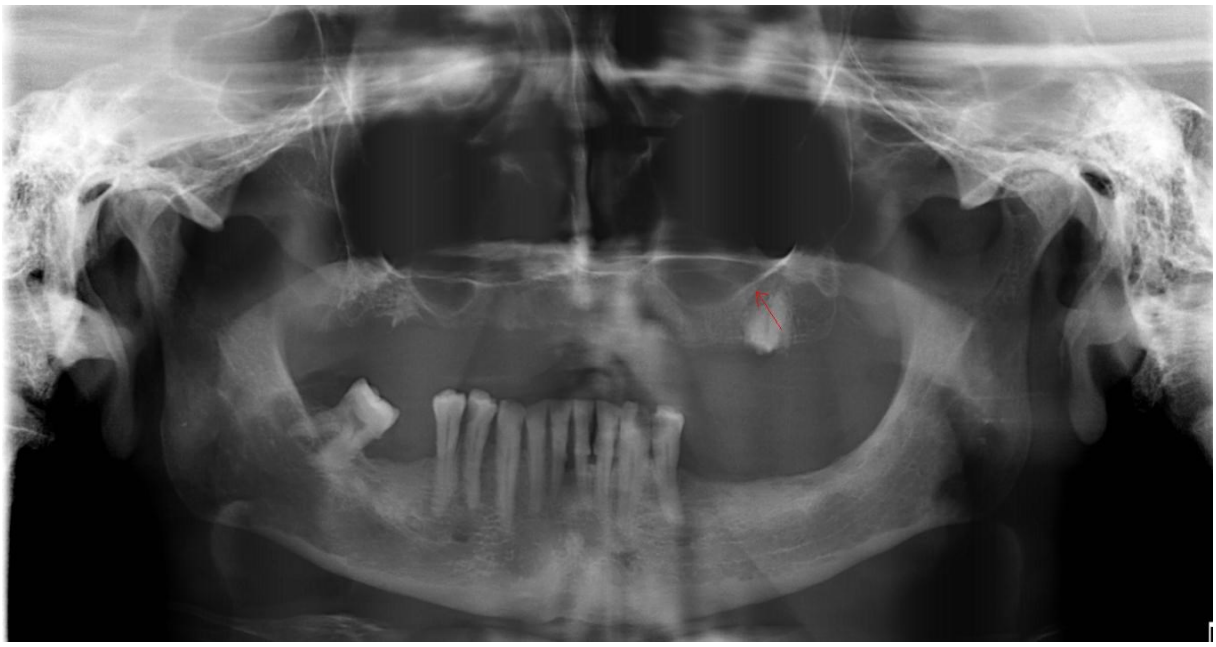

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