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## CASE REPORT: FRACTURE OF THE MAXILLARY TUBerosITY DURING TOOTH EXTRACTION AND SUBSEQUENT TREATMENT

**Rosen Tsolov**

Clinic of Maxillofacial Surgery, “St. George” University Hospital, Plovdiv, Bulgaria,  
dr.roentsolov@abv.bg

**Ivan Gerdzhirov**

Department of Prosthetic dentistry, Faculty of Dental Medicine, Medical University of Sofia,  
Bulgaria, [ivan\\_ger1971@abv.bg](mailto:ivan_ger1971@abv.bg)

**Abstract:** Introduction: Tooth extraction is a common surgical procedure, that can very often be accompanied by some complications such as swelling, edema, and trismus. In rare cases, fractures of the alveolar bone and jaws can also be observed. One of the possible complications while extracting maxillary teeth is the perforation of the maxillary sinus. In some cases, because of the use of excessive force during extraction, fracture of the maxillary tuberosity can occur. This can be further complicated by the penetration of a foreign body or parts of a tooth into the maxillary sinus.

Aim: The purpose of the present clinical case is to investigate the possibility of surgical treatment of maxillary tuberosity fracture complicated by the penetration of a dental pin into the maxillary sinus.

Materials and methods: The presented case is of a 43 y.o. female patients admitted urgently to the Clinic of Maxillofacial Surgery of “St. George” University Hospital, Plovdiv, Bulgaria, with severe pain after unsuccessful extraction of the upper right second molar 17, which was symptomatic prior to the extraction attempt. Orthopantomography revealed a fracture of the maxillary tuberosity and projection of the second molar roots and a dental pin within the maxillary sinus. During the intraoral examination, it was found that the second molar 17 was upstream to the right and there was pathological mobility of the entire right maxillary tuberosity. Under general anesthesia, a mucoperiosteal flap was elevated, the bone around the second molar was trepanned, the tooth was extracted, and the fractured tuber and dental pin present in the maxillary sinus were removed.

Results: The results of the treatment showed atraumatic restoration of the maxilla. The performed surgical treatment allowed the dental pin to be removed from the maxillary sinus without damaging tooth 16. The elevation of a mucoperiosteal lamp closed the oro-antral communication, thereby helping to restore nutrition and fluid intake. A month later, an Electro- Odonto-Diagnostic test (Pulp Vitality Test) showed normal values and preserved vitality of tooth 16.

Conclusion: The maxillary tuber fracture is a severe complication that requires immediate surgical treatment. The main purpose of the treatment is to close the communication with the maxillary sinus and prevent the risk of infection. The surgical technique used should be sparing to the adjacent teeth and soft tissues, to preserve them.

**Keywords:** dentoalveolar fracture, dental extraction, maxillary tuberosity fracture, tuber maxilla

### 1. INTRODUCTION

Tooth extraction is a normal and common surgical procedure performed at the dental office. Very often this procedure can also be accompanied by some complications such as swelling, edema, and trismus (Trybek, G. et al., 2016). In rare cases, fractures of the alveolar bone and jaws may also be observed (Aravena, P.C. et al., 2018).

One of the possible complications while extracting maxillary teeth is the perforation of the maxillary sinus (Okada, T. et Kawana, H., 2019; Rothamel, D. et al., 2007). In this case, communication occurs between the oral and nasal cavities, necessitating the elevation of a mucoperiosteal flap and closure of the defect (Hasegawa, T. et al., 2016).

Another possible complication resulting from the use of excessive force during extraction is the fracture of the maxillary tuberosity (Tay, Z. et al., 2018). The optimal therapeutic approach in these cases is to maintain the bone fragment by fixation to the adjacent healthy bone (Chrcanovic, B. R. et Freire-Maia, B., 2011). In cases where this is not possible, the bone segment is usually removed along with the affected teeth, which creates difficulties in the subsequent surgical and prosthetic restoration (Norman, J. E. et Cannon, P. D., 1967).

Sometimes the fracture of the maxillary tuberosity can be complicated by the penetration of a foreign body or parts of a tooth into the maxillary sinus (Deniz, Y. et al., 2016; Rodrigues, M. T., 2009). This requires a more complex surgical intervention to remove the foreign structures and restore the anatomical shape of the upper jaw (Dimitrakopoulos, I. et Papadaki, M., 2008).

Knowing the potential complications during tooth extraction allows for proper clinical behavior and gives us the ability to prevent their occurrence (Sumanth, K. et al., 2016).

## 2. AIM

The purpose of the present clinical case is to investigate the possibility of surgical treatment of maxillary tuberosity fracture complicated by the penetration of a dental pin into the maxillary sinus.

## 3. MATERIALS AND METHODS

The presented case is of a 43 y.o. female patients admitted urgently to the Clinic of Maxillofacial Surgery of “St. George” University Hospital, Plovdiv, Bulgaria, with severe pain after unsuccessful extraction of the upper right second molar 17, which was symptomatic prior to the extraction attempt. Orthopantomography (Fig. 1) revealed a fracture of the maxillary tuberosity and projection of the second molar roots and a dental pin within the maxillary sinus. During the intraoral examination, it was found that the second molar 17 was found upstream to the right and there was pathological mobility of the entire right maxillary tuberosity.

*Fig. 1. Orthopantomography upon admission*



Under general anesthesia, a mucoperiosteal flap was elevated, the bone around the second molar was trepanned, the tooth 17 was extracted and the fractured tuber removed. Also the dental pin present in the maxillary sinus was removed.

## 4. RESULTS

This was followed by plastic closure of the resulting oro-antral communication with adjacent tissues by the Axhaus method (Fig. 2, 3). Although the patient had a symptomatic tooth in the fractured area, she made a successful recovery and preserved functionality in the treated area.

*Fig. 2. Suture after sinus plastic*



*Fig. 3. Orthopantomography after surgical treatment*



The results of the treatment showed atraumatic restoration of the maxilla. The performed surgical treatment allowed the dental pin to be removed from the maxillary sinus without damaging tooth 16. The elevation of a mucoperiosteal flap closed the oro-antral communication, thereby helping to restore nutrition and fluid intake. A month later, an Electro- Odonto-Diagnostic test (Pulp Vitality Test) showed normal values and preserved vitality of tooth 16.

## 5. DISCUSSION

The fracture of the maxillary tuberosity is a serious complication after tooth extraction. The method of its treatment is determined by the size, location, and the extent to which the maxillary sinus is damaged. In this case, the bone fragment had to be removed, which is the typical clinical behavior in most cases (Deniz, Y. et al., 2016). Also, the dental pin present in the maxillary sinus was removed, which, according to most authors, is important for the prevention of infection (Deniz, Y. et al., 2016; Rodrigues, M. T., 2009). The careful surgical approach allowed the preservation of the vitality of the adjacent tooth 16 and helped the healing processes. The postoperative period passed without problems and complications, which led to a rapid recovery of speech and fluid intake capability. Despite significant bone loss, no functional impairment was observed and the patient returned to her normal rhythm of life.

## 6. CONCLUSION

The maxillary tuber fracture is a severe complication that requires immediate surgical treatment. The main purpose of the treatment is to close the communication with the maxillary sinus and prevent the risk of infection. The surgical technique used should be sparing to the adjacent teeth and soft tissues, to preserve them.

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