**Case Report**

# Surgical Removal of Maxillary Impacted Second Premolar

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## Abstract

In clinical settings, impacted teeth are a typical occurrence. Because of their proximity to the nasal and oral cavity, impacted teeth have the potential to create more severe and catastrophic difficulties, such as the formation of dentigerous cysts and other disorders. The goal of this report is to look into the fundamentals of treating maxillary premolars that have been palatally impacted. A case report of a palatally impacted right maxillary second premolar is presented in this case report.

**Keywords:** Maxillary Impacted Second Premolar, nasal and oral cavity.

## Introduction

Impaction is a pathological condition that causes the tooth to not be able to erupt in the oral cavity within a certain time frame. [1, 2] It is a common occurrence in clinical practice, while its prevalence varies from one area to the next and from one tooth type to the next. Molars and canines are observed to be significantly more impacted than other teeth. [3] The occurrence of impacted premolars varies according to age. The overall prevalence is 0.5 percent (the range for maxillary premolars is 0.1-0.3%, and for mandibular premolars is 0.2-0.3%). Local variables such as mesial drift of teeth caused by early loss of primary molars, disease such as inflammatory or dentigerous cysts, or ectopic positioning of growing premolar tooth buds can all cause premolar impactions. It's sometimes linked to over-retained or ankylosed primary molars, as well as conditions like cleidocranial dysostosis. [4, 5] Impacted premolars, like any other impacted tooth, cause plenty of issues, including cosmetic conflict, decreased masticatory efficiency, and poor dental cleanliness. Apart from that, an impacted maxillary premolar may be in close proximity to the nasal and antral cavity floors, posing the risk of further issues that may necessitate major surgical intervention. [6, 7] A case report of an impacted right maxillary second premolar on the palatal side is presented in this article.

## Case Presentation

Patient was Female aged 13 undergoing fixed orthodontic treatment for the past 1 year. The condition was classified as Dental Class II Malocclusion. Upon investigation, it was revealed via OPG and a Cone Beam CT (CBCT) (Figure 1and 2) that she had a palatally impacted upper right second premolar which was lying horizontal to the roots of upper right first premolar. Her treatment plan was designed with extraction of upper right deciduous second molar and removal of the impacted second premolar to negate the risk of resorption of the roots of first premolar on the same side. Patient was given fixed straight wire orthodontic appliances for 1 year and the deciduous tooth was extracted with all the necessary tooth movements to align and level the arches. Surgery was planned and referred to a Consultant Oral and Maxillofacial Surgeon who confirmed that surgical removal was the treatment of choice after careful clinical and radiographic examination.

**Investigations**:

Apart from the clinical investigation, various radiographic means of evaluation and investigation were used which were Standard OPG, Cone Bean Computerized Tomography (CBCT), 3D Computerized Tomography (CT) and Lateral X-rays.

**Treatment:**

The case was treated in a regular dental setting under Local Anesthesia (2% Lidocaine 1:100000 Adrenaline) which was administered to anesthetize the buccal and palatal soft tissue along with concerned roots of the teeth in upper right quadrant extending upto the nasopalatine foramen. Intra Oral approach was used, an envelope flap (fig 3a) was elevated using surgical blade No. 15 extending mesial to upper right first molar till distal border of upper right central incisor to expose the second premolar covered by bone. A round bone cutting bur was used in a slow speed handpiece to carefully remove the bone covering the crown of the impacted tooth until it was exposed and both cusps visible. Adequate bone guttering was done next to free the crown and an engage point was found where a straight elevator was engaged. Upon luxating the crown profusely, a premolar forceps was used and the tooth was soundly delivered. The flap was carefully sutured back into position (Figure 3 b), patient was given post op instructions and prescribed an antibiotic (Amoxicillin; Clavulanic Acid 375mg BD) and a painkiller (Diclofenac Potassium 50mg 1 stat and SOS) regimen. Follow up for suture removal was planned after 1 week.

**Figure 1: OPG and Lateral Radiographs**

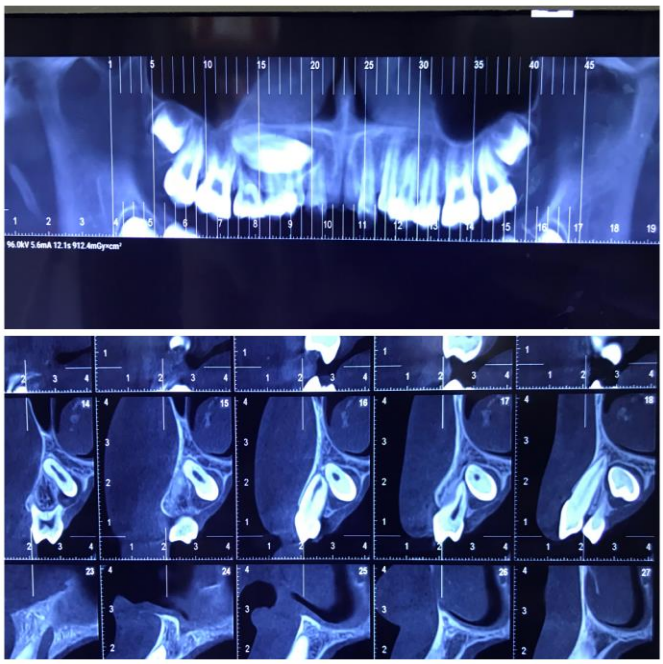

**Figure 2: CBCT of the patient**

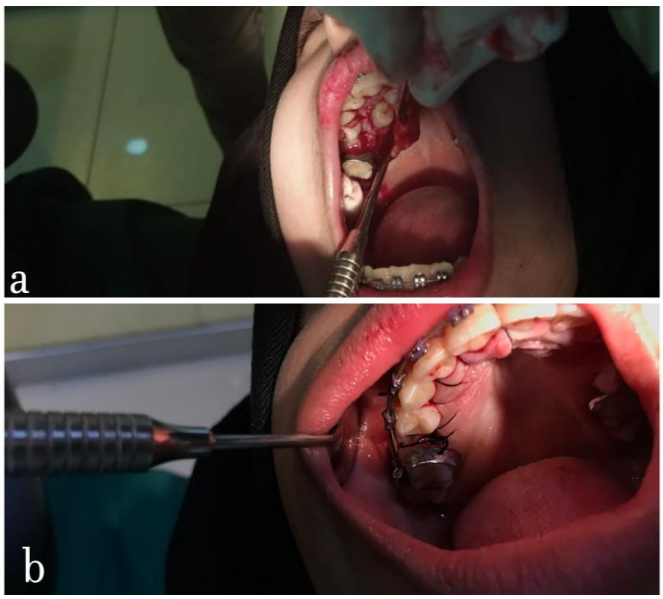


**Figure 3:**
**a: Flap raised and exposed premolar**
**b: Flap sutured back**

## Discussion

Impaction of teeth can be caused by a variety of factors, including lack of arch length, ectopic location, mechanical blockage, malformed teeth, over-retention of primary teeth, or ankylosed primary teeth, trauma, and systemic disorders. [3] Studies about impacted premolars is short and inadequate. The prevalence of impacted premolars is around 1% among ethnic Chinese in Hong Kong, and 2.2 percent of impacted premolars were found in a recent study in a North Greek community; the most commonly impacted teeth were second mandibular premolars, followed by second maxillary premolars. [8, 9] Such disparities in prevalence rates could be attributed to variances in the patients' genetic and ethnic origins. In contrast to mandibular premolars, which are buccally positioned, maxillary premolars are palatally positioned, making it harder for patients to notice them. They are frequently detected only after pain and swelling have occurred, resulting in late reporting. [10] This can be dangerous since impacted teeth are often close to the nasal cavity or the maxillary antrum. [11]

For good treatment, precise and accurate diagnosis is essential. Aside from a visual clinical examination, which should raise the possibility of an impacted tooth in cases of missing teeth beyond the expected date of eruption, several available radiological tools should be used. [11] The use of radiographic techniques is critical in the planning of surgical procedures. According to a study, appropriate radiographic examinations can be used to visualize the morphological changes associated with impacted teeth and their relationship to surrounding structures in the diagnosis and surgical planning of impacted teeth. Periapical, occlusal, and panoramic radiographs are the most commonly recommended radiographic procedures. However, due to the limitations of radiography, thorough viewing of all structures in the region in three dimensions (3D) may not be possible. [12, 13]

Due to the complexity of placement, orientation and proximity of impacted teeth, specific radiographic diagnostic tools are essential. Cone-beam computed tomography (CBCT) is a very valuable tool for assessing impacted teeth, and it is increasingly being utilized in adjunction to traditional procedures. [14] In comparison to helical tomography, recent literature advocates using CBCT because of its advantages, which include detailed viewing of the area and lesser patient exposure. Through multiplanar images, CBCT allows for the accurate identification of the tooth and the establishment of relationships between it and neighboring structures.[14,15] We also used current radiography techniques such as CBCT in addition to traditional panoramic radiographs (orthopantomogram) in this case.

Injury to the neighboring periodontium, nerve damage, and injury to adjacent teeth are all examples of surgical complications. [4] In our situation, the

surgical extraction was performed from the palatal side, which can make access more difficult. But, luckily, there were no difficulties.

Observation, intervention, relocation, and extraction are the most common treatment methods for impacted teeth. There may be some interaction between these therapeutic methods on occasion. [3] The observation does not include any treatment other than clinical and radiological monitoring of the patient. It involves monitoring a child or adolescent for a specific amount of time, which can be separated into pre- and post-impaction periods. Simple extraction of primary teeth usually suffices as a part of the intervention. Depending on the cause of the impaction and the specific tooth impacted, a permanent tooth extraction may be required. A brief term of orthodontic therapy to relieve the impaction is included in the intervention. Surgical relocation of the affected tooth or, more commonly, orthodontic traction of the impacted tooth is referred to as relocation. [16, 17] Depending on the causes of the impacted tooth, a permanent tooth may need to be removed. [16] Despite being somewhat thorough, the surgery produces outstanding outcomes and causes no lasting cosmetic or functional damage. [18] Second premolar extraction has advantages, according to the literature it noted that it preserves a good marginal relationship with the mandibular first molar contact point and speeds up space closure. [19] However, premolar extraction, according to certain writers, causes vertical dimension collapse and temporomandibular problems. [20, 21]

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