

Bucco-lingual Impaction of Mandibular Second Premolar: Case Report and Review of Literature

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ABSTRACT

Mandibular second premolars rank third after third permanent molars and maxillary permanent canines in frequency of impaction. They are found impacted at different angulations and positions and should be carefully evaluated radiographically during treatment planning. This article reports a rare occurrence of bucco-lingually impacted mandibular second premolar treated with odontectomy and odontotomy with a brief review of the literature.

Keywords: bucco-lingual, impaction, mandible, second premolar, transverse.

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I. INTRODUCTION

Impaction or Impeded eruption of permanent teeth has been one of the frequently encountered clinical problems constantly posing a challenge to the dental professionals. Mandibular second premolars rank third after third permanent molars and maxillary permanent canines in frequency of impaction [1]. The prevalence of impacted mandibular premolars reported in the literature range between 0.2% - 0.76% [1]-[3]. Gender predilection to impacted premolars available in the literature is variant and inconclusive [2], [3].

Most cases are asymptomatic and usually diagnosed during routine examination. Various etiological factors have been implicated in the impaction of premolars including local and systemic factors such as lack of space; arch length deficiency; ectopic position of the developing premolar tooth buds; over retained or ankylosed primary molars; down's syndrome, cleidocranial dysplasia, hypothyroidism, and hypopituitarism [4], [5]. Whilst most commonly encountered position of impacted premolars reported in the literature in the order of occurrence included mesio-angular, vertical, disto-angular or horizontal, the occurrence of transverse or bucco-lingual position has been found to be uncommon [3]. Reports of bucco-lingual impaction of mandibular premolars are very

scarce in the literature [5]-[7].

This article presents a rare case of buccolingually impacted mandibular right second premolar in a 14-year-old female which was surgically removed (radical approach) along with a brief review of the literature.

II. CASE REPORT

A 14-year-old female presented to the paediatric dental unit for routine dental examination. Her medical and dental history was not significant and there was no history of dento-alveolar trauma. On clinical examination, oral hygiene appeared good and a retained carious mandibular right second primary molar (85 FDI) was seen and its successor i.e., mandibular right second premolar (45 FDI) was missing clinically (Fig. 1). On palpation, a slight bulge was felt on the lingual cortical plate cervical to 85. Initial radiographic evaluation with a periapical radiograph revealed that 45 was impacted in a horizontal position with its crown lying at a level below the middle third of roots of 46 and inclined towards distal (Fig. 2). On panoramic radiograph, it appeared that 45 was impacted with vertical orientation and had immature root development with wide open apex (Fig. 3).



Fig. 1. Occlusal view of lower right arch (mirror image)



Fig. 2. Periapical radiograph showing impacted 45 in horizontal position.



Fig. 3. Panoramic radiograph showing impacted 45 in vertical position.

However, upon further evaluation with a mandibular occlusal (axial) radiograph, 45 was seen transversely (buccolingual) impacted with the crown oriented lingually and root towards the buccal cortical plate (Fig. 4). Conventional orthodontic traction with surgical intervention or auto-transplantation was not viable due to unfavourable position of 45. The final treatment plan included extraction of 85 and surgical removal of 45 from the buccal approach, followed by orthodontic alignment and subsequent replacement with a fixed prosthesis, when appropriate.



Fig. 4. Mandibular occlusal radiograph showing buccolingually positioned 45 with crown towards lingual.

Under local anaesthesia, an intrasulcular incision was made on the buccal aspect of alveolus and a full thickness mucoperiosteal flap was raised. A window was created by

removing the overlying cortical bone to expose the impacted tooth using a sterile highspeed handpiece cooled with sterile saline solution. Since the tooth was oriented buccolingually, it was sectioned (odontotomy) and surgically removed (odontectomy) (Fig. 5).



Fig. 5. Extracted lower right second premolar through buccal approach.

The wound was irrigated, homeostasis achieved, and resorbable sutures were placed to close the wound. The surgery was uneventful, and no complications arose during or after the procedure. The patient was referred for further treatment.

III. DISCUSSION

Studies on impacted premolars are not extensive in the literature and limited information is available on the guidelines for their management. Management of impacted premolars have been reported to be influenced by various factors such as the patient's age, medical history, functional and occlusal relationships, patient's attitude, and compliance to treatment [8], [9]. Furthermore, the underlying causative factors, space availability, status of adjacent teeth including retained primary molars, depth and orientation of impaction and root formation of the impacted premolar should be considered while selecting an appropriate treatment option [6].

Several treatment options available in the literature include periodic observation; extraction of the retained primary predecessor and monitoring of the succedaneous tooth for possible spontaneous eruption; surgical exposure and exteriorization, with or without orthodontic traction; surgical repositioning (autotransplantation); and surgical removal of the impacted premolar [6], [7], [10], [11]. Periodic observation has been found to be reasonable in patients where the angulation of the impacted tooth is less than 90°, and spontaneous eruption would occur upon provision of adequate space and/or removal of any obstruction such as extraction of the primary predecessor [5], [6].

Unerupted second premolars presenting with adverse angulation, evident on radiographs, at an early stage may spontaneously erupt into an upright position later during growth [12]. Collett (2000) had described a case of 13-year-old female with horizontally inclined lower right second premolar with the unusual feature of its long axis lying transversely. After extraction of deciduous second molar, spontaneous eruption of unfavourably inclined premolar up to the level of occlusal plane had occurred in 16 months [5]. According to McNamara & McNamara [6], the most reasonable and recommended treatment modality in cases

with limited probability of spontaneous eruption and where observation is not perceived to be pertinent would be surgical exposure of the impacted tooth followed by forced orthodontic eruption. Current literature states that the degree of dental angulation might be an unreliable parameter for evaluation of the probability of spontaneous eruption [10].

Orthodontic intervention of impacted teeth includes space regaining with a fixed appliance to facilitate a more favourable alignment upon spontaneous eruption. The prognosis and treatment outcome of surgical and orthodontic management will be affected by the position and angulation of the impacted tooth, available space, and the duration of treatment. Although this mode of approach is more time consuming, it is considered less invasive and results in fewer complications [9]. In severely impacted premolars with an unfavourable position and/or an angulation between 90° and 180°, especially premolars with immature root formation, if other treatment alternatives are not possible and premolar extraction is contraindicated, prompt treatment with surgical repositioning or autotransplantation of the impacted tooth to its normal position might be a viable treatment option [5], [13]. Watanabe et al. [14] had reported that transplantation of impacted premolars with developing roots, preferably one-half to three-fourth final root length, would be easier and have a higher chance of a favourable outcome. In our case discussed here, the impacted second premolar presented immature root development and hence surgical repositioning or autotransplantation with orthodontic intervention could have been attempted, but due to financial constraints and longer duration of treatment, the patient was non-compliant and these options were not feasible. Further, as the position of the bucco-lingually impacted mandibular right second premolar was unfavourable, the treatment outcome was uncertain and so surgical removal was planned.

Operational complications, reported in the literature, during surgical removal of severely impacted premolars with unfavourable angulation and restricted surgical access include injury to adjacent teeth and periodontium, nerve damage and alveolar bone defects which might compromise future implant placement [9], [13]. Literature is still inconclusive regarding the use of a conservative approach or a more radical intervention for impacted second premolars with adverse angulation. In growing patients, especially in whom implantation is contraindicated, the predictability of different treatment modalities should be properly evaluated during treatment planning [15].

The tooth germ of the mandibular second premolar frequently deviates from its ideal developmental position and presents itself ectopically in an abnormal location or angulation [11]. The etiology of this phenomenon is still obscure. In the present case, proper etiological factor causing impeded eruption of mandibular second premolar could not be ascertained.

Radiological assessment of impacted teeth is an important prerequisite for surgical or orthodontic treatment. Radiographic discrepancies in the visualization of lower premolar angulation has been reported in panoramic radiographs [16], [17]. Panoramic radiographs, being two-dimensional images, have limited spatial resolution resulting in the distortion of actual location and depth of the lesion relative to adjacent structures. Further, one of the limitations

of panoramic radiography include non-visualization of the buccolingual plane [18]. Nohadani et al. [19] in a study demonstrated that in 18% of the children with unerupted second premolars, the displacement seen on panoramic radiographs was a false-positive finding. Ismail et al in 2020 had described a case where lower right second premolar presented with vertical impaction on a periapical radiograph but was later found to be transversely impacted on an axial radiograph [7]. Similarly, in our case, positional discrepancy in the panoramic and periapical radiography was ascertained after an additional evaluation with a mandibular occlusal radiograph. The importance of proper radiological assessment of the depth and angulation of the impacted teeth using an occlusal radiograph or cone beam computed tomography should be emphasized.

IV. CONCLUSION

The present case describes an unusual occurrence of bucco-lingual orientation of the impacted mandibular second premolar. The patient attitude and compliance to the treatment plan plays a vital role, in addition to the mode of approach, in the successful management of impacted premolars. Clinical decisions made on the best available and valid evidence results in better success rates.

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