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An Overview of Supernumerary Teeth with Special Emphasis About Parapremolars -An Orthodontic Perspective

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Abstract: *Supernumerary teeth are those teeth which are surplus to normal set of teeth in both primary and permanent dentition[1]. One of the less commonly seen supernumerary teeth in contrast to mesiodens and distomolars is parapremolars. Its appearance is same as premolars and occurs frequently in mandibular premolar region. Generally, most of the parapremolars are asymptomatic and they stay impacted which poses a possible risk of root resorption to overlying teeth. The aim of this paper is to describe the procedure, complications, and management of parapremolars in orthodontic perspective and to discuss two case reports.*

Keywords: *supernumerary teeth, parapremolars, root resorption, management*.

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I. Introduction

The process of tooth development begins with epithelial-mesenchymal interaction during the stage of initiation and it marks the genesis of dental lamina. Any interference in this stage might result in missing tooth (hypodontia, oligodontia, anodontia) or teeth in excess (hyperdontia)[2]. A supernumerary tooth (ST) may be single or multiple, erupted or impacted, unilateral or bilateral in distribution, may occur in both primary and permanent dentitions. According to Rajab and Hamdan,[3] the incidence of ST for males is higher than females with 2:1 ratio given by Mitchell[3]. The prevalence of supernumerary teeth varies between 3-6 % of which parapremolars account for only 8-10% and it occurs more commonly in the mandible. Shapira and kuftinec,[4] reported the order of frequency as being maxillary central incisors, molars, premolars followed by lateral incisors and canines.

The formation of ST is due to localized hyperactivity of the dental lamina. The mobility of the facial process during facial growth can result in the rupture of the dental lamina and penetration of these ruptured structures results in the emergence of additional tooth[5,8]. The other causative factors will be dichotomy (splitting) of tooth germ, atavism (phylogenetic reversion) and mutations of DNA as in craniofacial anamolies. Rao and Chidzonga,[6] stated multifactorial cause which includes genetic and environmental factors. Multiple supernumerary teeth can be seen commonly in association with Gardners syndrome, labial palatal cleft, Fabry-Anderson syndrome and Cleidocranial dysostosis[4,6,7].ST are classified based on shape- conical, tuberculate, supplemental and odontoma, location- mesiodens, paramolars, distomolars and parapremolars[4].To designate the ST in universal numbering system a letter is added ("A", "a" or "S") to the parent tooth number. Yusof,[9] used a regional quadrant palmer style notation (A for anterior, PM for premolar, M for molar). Acton, [9] denoted the parapremolars as "supernumerary 5". In FDI system adding a third digit to the FDI notation to indicate supernumerary (11.1 read as "one-one-one" or 11. A)[9].

Parapremolars is a supernumerary teeth which forms in the mandibular premolar region with the frequency of 74% and sometimes referred as "peridens"[10,11]. Solares et al,[5,11] found that parapremolars occurs commonly in males than in females (3:1), indicating a sex linked inheritance. Parapremolars are mostly seen in lingual aspect. When present in buccal aspect, they are partially or completely erupted. Third premolars might form until 13-14 yrs that is 7 to 11 years after the development of normal premolars. However, the root formation of third premolars occurs until age of 23 years[8]. Parapremolars are found beneath the roots of permanent premolars and molars. The location of parapremolars may cause delayed eruption, displacement of permanent teeth, crowding, spacing, abnormal root formation and root resorption. Bodin,[7] reported that only

2% of the supernumerary are likely to undergo pathological changes. Solares and romero,[5] reported the recurrence of supernumerary premolars after surgical removal was 8% and explained that dental lamina is not resorbed completely and is reactivated at the time of crown completion of the normal permanent teeth. The diagnosis is usually made as a result of incidental finding during routine panoramic X–ray studies and additional radiographs using periapical radiograph with vertical and horizontal tube shift techniques and occlusal radiographs are taken to localise it. The visualisation of the precise location of the tooth through conventional radiographs is not relaible and dilemmatic situation prevails. The recent developments in 3D imaging systems such as CBCT has enabled dentists to better visualize supernumerary teeth and adjacent teeth root resorption with better contrast and more detail[9].

The management of parapremolars is still controversial whether to extract or to observe. When parapremolars are in close proximity to developing permanent root, their removal can be delayed as the surgical intervention at this stage poses risk to developing tooth. Supplemental parapremolars which has been erupted either can be extracted or retained for substitution of missing neighbour tooth. Depending upon the presence or absence of complications or pathological signs impacted parapremolars are extracted (if symptomatic) or it is kept under regular radiographic follow (if asymptomatic). The aim of this paper is to describe about the different therapeutic approaches regarding the management of parapremolars.

II. Case Report

A 23year old female reported to the Department of Orthodontics with the cheif complaint of forwardly placed upper front teeth. On extraoral examination, the patient had a convex profile with incompetent lips. Intraoral examination revealed normal set of dentition with class I molar and canine with bimaxillary dentoalveolar protrusion. On routine radiographic examination involving OPG (**Fig 1**) revealed the presence of two supernumerary teeth present in relation to permanent mandibular right and left second premolar. The patient was examined for any signs of syndrome. There were no signs detected. The treatment was started with extraction of all first premolars and surgical removal of both parapremolars was delayed as it was completely asymptomatic. After the completion of space closure and at the time of root parallelism, surgical removal of parapremolars were advocated. Parapremolars in relation to permanent mandibular left second premolar was present lingually and another parapremolar in relation to permanent mandibular right second premolar was present buccally. One by one was removed with interval of two weeks. After surgical removal of both parapremolars, finishing and settling of occlusion is done (**Fig 2**).

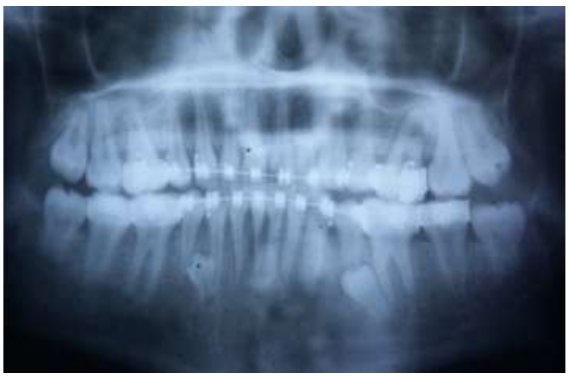

Fig 1. Pretreatment OPG showing bilateral parapremolars

Fig 2. Post treatment OPG

III. Case Report

A 18year old male patient reported to Department of Orthodontics with the cheif complaint of irregularly placed upper front and lower teeth. On extraoral examination, the patient had a class II facial profile with incompetent lips. Intraoral examination revealed the presence of class II molar relation on right side and class I on left side. On radiographic examination (**Fig 3**) a supernumerary parapremolar was present in between permanent mandibular left first and second premolars. There is evidence of root resorption in relation to permanent mandibular left first premolar. As it may cause hinderance during treatment, surgical removal of parapremolar was advised before the commencement of fixed orthodontic therapy(**Fig 4**).

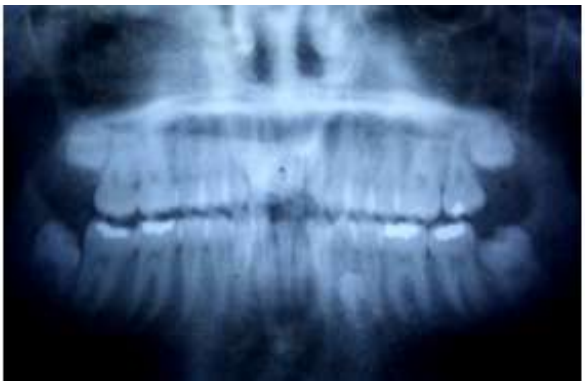

Fig 3. Pretreatment OPG showing parapremolar in relation to permanent mandibular left premolars

Fig 4. OPG post surgical removal of parapremolar with orthodontic appliance

IV. Discussion

It is essential to identify the presence of parapremolars clinically and radiographically before a definitive diagnosis. According to Yusof,[13] the parapremolars were the most common supernumerary teeth (ST), followed by molars and mesiodens. Although ST can erupt normally due to late formation and they remain generally impacted approximately 75%[5]. After discovering ST, the decision to extract or monitor depends mainly on risk and benefits of surgical removal, location, developmental stages and finally complications. In first case described here, the presence of parapremolars (**Fig 1**) was an incidental finding and the removal was delayed as it was not associated with any pathology or complications like resorption or disturbance to orthodontic treatment. As it was in close proximity to mental nerve, obviously surgical intervention might create damage to tooth roots and loss of vitality [12]. It was decided to keep under observation with routine radiographic follow up. It was removed only during final stages of treatment (**Fig 2**). In Koch and Schwartz studies,[12,15] they stated that immediate removal of teeth is not necessary if there is no underlying pathology. One of the main disadvantage after removal of parapremolars, extraction spaces opened up which was closed earlier. De Oliveira Gomes et al,[15] suggested that supernumerary should be removed based on development, regardless of the morphology type. Supernumerary in mandibular premolar region are removed based on developmental stage(i.e. fully developed, a fully developed crown with root formation, and a fully developed crown), the removal will be easier when it is fully developed[5].The supernumerary with crown formation is difficult to remove and incomplete removal may lead to recurrence. Shah et al and Garvey et al,[15] suggested to monitor the ST if there are no associated complications and annual radiographic evaluation is advisable.

In second case, parapremolar was removed (**Fig3,4**) before fixed orthodontic therapy since retention of it would lead to resorption of adjacent tooth roots. The parapremolars are seen dormant between permanent premolars and molars blocking the eruption of permanent tooth and eventually causing root resorption of adjacent tooth which was reported by Hyun et al[14]. In Yassin and Hamori's study,[6] the offending ST were extracted earlier for better prognosis. Hogstrum and Andersson,[3] suggested the removal of supernumerary as soon as it has been diagnosed. Minguez- Martinenz et al,[15]suggested surgical removal by orthodontic treatment is essential if ST causing impact on adjacent teeth.

V. Conclusion

Supernumerary teeth occur in addition to normal dental formula. Early diagnosis is very important to minimise the risks of complications but this does not mean extraction is the only treatment of choice. Therefore if the tooth is asymptomatic, it is left in situ and kept under observation. Periodic clinical and radiographic evaluation has to be done because pathological changes may occur over a long-term.

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