

Oligodontia: A Case Report

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ABSTRACT

Background: An impacted tooth is the one which failed to erupt into its normal position due to various local and genetic factors. The most commonly impacted teeth are the third molars followed by canines and premolars. The absence of any one tooth due to failure of eruption, but absence of many teeth in the oral cavity due to impaction and as well as absence of tooth buds, is certainly contributed by some genetical abnormality. This article is a case Report of oligodontia and impacted mandibular first premolar. Both environmental & genetical factors are involved in etiology of oligodontia Hence identification of genetic and environmental factors may be particularly useful in the early prediction of this condition and development of prenatal strategies and novel treatments in further.

Keywords: Impacted, Genetic, Premolar, Oligodontia.

INTRODUCTION

Management of impacted teeth are not common for every symptomatic tooth. Impacted third molars are extracted undoubtedly but in case of teeth in esthetic zone and functional zone are tried to bring them into occlusion to gain normalcy. Mandibular premolars are most commonly impacted than maxillary premolars¹. The prevalence of impacted premolars has been reported to be 0.5% in which the maxillary premolars range from 0.1% to 0.3% and mandibular premolars 0.2% to 0.3%.^{2, 3}

Oligodontia is generally non-syndromic but frequently associated with oral clefts and other syndromes. Oligodontia are common in patients with downs syndrome and ectodermal dysplasia. Partially erupted or impacted teeth associated with or without cystic lesions are also associated with local factors during eruption or development challenges. Reason for failure of teeth to erupt into oral cavity can be varied, ectopic positioning of

permanent teeth, lack of space to erupt, transposition of teeth, early loss of deciduous or retained deciduous teeth. Spacing and tooth material arch length discrepancy can also be reason for impaction. In management of such cases various treatment methods have been suggested including observation, interceptive orthodontics, surgical exposure with orthodontics intervention and extraction depending on position of impacted tooth and relationship with adjacent teeth and need for orthodontic treatment^{4, 5, 6}

CASE REPORT

A 15-year-old female patient presented with a chief complaint of missing permanent teeth. Patient is having concave profile. On intra-oral examination, Maxillary and mandibular lateral incisors, canines and first premolars, mandibular central incisors, were missing along with over- retained deciduous mandibular lateral incisors, canines and maxillary canines. Patient revealed with bony exostoses in the

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mandibular premolar region. Patient blood investigations were unremarkable. Patient was advised for investigations like OPG and CBCT which revealed the impacted mandibular right first premolar (fig.1),(fig.2) which is positioned at the level of middle third between roots of right deciduous lateral incisor and canine which is perpendicular to the long axis of the teeth. The perpendicular positioning of the impacted tooth and complete root formation made us to decide to surgically remove the tooth. The patient has been undergoing fixed orthodontic treatment for correction of spacing (fig.3). After stage 1 of orthodontic therapy, surgical extraction of impacted premolar was performed (fig.4), (fig.5). Closure of surgical site was done by placing 3-0 black braided silk suture material. After a normal healing period, suture removal had done and patient is continuing her orthodontic treatment.

DISCUSSION

An impacted tooth is the one which is embedded within the bone and its eruption is prevented by various factors. General factors include syndromes like Cleidocranial dysplasia which is inherited as in autosomal dominant trait with major oral manifestations as delayed loss of primary teeth⁷, Yunis-varon syndrome which includes clavicular hypoplasia, severe micrognathic hypodontia, spinal deficiency and digital anomalies^{8 9}. Local factors include insufficient space, early loss of primary teeth and closure of space, over-retained primary teeth, rotation of tooth buds or crowding of tooth buds, excessive fibrous tissue over an erupting tooth, lack of eruptive force, long path of eruption, and nourishment of the patient¹⁰. Oligodontia patients usually tend to have mandibular plane angles associated with smaller lower anterior face height and lip protrusion¹¹. Other features include smaller maxilla and mandible lengths and a class III skeletal relationship tendency¹².

A recent theory hypothesized that the last of each class were vestigial bodies that become obsolete during the evolution process¹³. More currently there is a theory that evolutionary change is working to reduce the human dentition by the loss of an incisor, premolar and molar in each quadrant. According to Vastardis (2000), as humans evolve, the size of the jaws and the number of the teeth

appear to be decreasing¹⁴. Grahnen was first to count hypodontia as a hereditary anomaly and deemed that the transmission is determined by a dominant autosome with incomplete penetrance and variable expressivity¹⁵. Over 300 genes are expressed and involved in tooth morphogenesis, including MSX1, PAX9, AXIN2, EDA, SPRY2, TGFA, SPRY4, WNT10A, FGF3, FGFR2, and BMP4.^{16 17 18}



Fig 1:Pre-operative orthopantomogram of the patient showing impacted mandibular right first premolar.

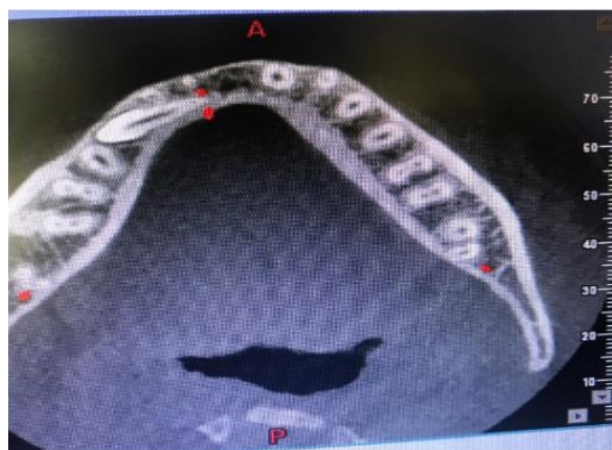


Fig 2: CBCT of the patient showing impacted mandibular first premolar.



Fig 3: Frontal view of the patient during stage I orthodontic treatment.



Fig 4: Picture showing impacted premolar after exposing the site through bone guttering.



Fig 5: Picture showing impacted premolar after sectioning of the tooth.

Other factors which are non-syndromic associated with impacted teeth are hypothyroidism, hypoparathyroidism, pseudohypoparathyroidism, metabolic diseases like vitamin deficiency. Impaction of teeth can be prevented by guided eruption with coordinated management. Primary failure of eruption (PFE) is a rare disease defined as incomplete tooth eruption despite the presence of clear eruption pathway which might be a cause in this case^{19 20}. The specific reason for missing teeth was considered as a disturbance which is purely genetical²¹. The PFE causing genes are molecules which functions solely in pre- eruptive phase and

are expressed in dental follicle and surrounding structures.

The genes like CSF-1, NFD, C-fos might be responsible for primary failure of eruption. In our case, patient's mother and younger brother found to be having oligodontia which is suggestive familial genetic traits.

CONFLICT OF INTEREST

No potential academic conflict of interest relevant to the above article was reported.

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