

Case report:

Developmental anomaly: Fusion: A case report and review of literature

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Abstract:

Fusion is a rare dental developmental anomaly. Fusion can be defined as the union of two normal teeth, with separated tooth buds, fused leading to the formation of a joined tooth with confluence of dentin. Fusion is more common in deciduous dentition than the permanent dentition, with higher prevalence in maxillary anterior region. This paper discusses the anomaly of fusion, reviews the literature regarding this problem, and presents the factors that may contribute to its etiology along with a case report of a rare case with fusion (fusion totalis) of maxillary central incisor and mesiodens.

Keywords: Developmental anomaly, Fusion, Mesiodens

Introduction:

Developmental anomalies of dental origin forms a major category of dental variations. Anomalies in tooth number, size, shape and morphology are common. Fusion is a rare development anomaly. This paper discusses the anomaly of fusion, reviews the literature regarding this problem, and presents the factors that may possibly contribute to its cause along with the various treatment modalities practiced to treat this rarity along with a case report of fusion between maxillary right central incisor and mesiodens.

By definition supernumerary teeth are extra teeth in comparison to the normal dentition.¹ According to Alberti et al, mesiodens are the most common type of supernumerary tooth.² The term mesiodens was coined by Balk³ in 1917 to denote a supernumerary tooth located between the two central incisors. According to the shape and size it is of two types' eumorphic and dysmorphic. Eumorphic is having similar size of central incisor and dysmorphic have different shapes including conical, supplemental, tuberculate and odontomes.⁴ The first case of

mesiodens reported dates back to Lower Pleistocene era.²

Mesiodens can be classified on the basis of their occurrence in the permanent dentition (rudimentary mesiodentes) or the primary dentition (supplementary mesiodentes),⁵ also can be classified according to their morphology (conical, tuberculate or molariform).^{6,7}

Fusion has been defined as the dentinal union of two or more originally individual teeth.⁸⁻¹² Fusion is the union of two teeth normally, with separated tooth buds leading to the formation of a joined tooth with confluence of dentin.¹³ It may be complete or incomplete (partial or total i.e. fusion totalis, partialis-coronaries or partialis-radicularis)^{14,15,16} based on which stage of development the fusion occurred.¹⁷ It may involve a normal and a supernumerary tooth (mesiodens or supplementary tooth).¹² Fusion of teeth has also been known with following synonyms "connate teeth," "joined teeth," "double formations," and "synodontia."^{18, 19} The purpose of this paper was to report the case of 15 year old boy with fusion of a

supernumerary tooth and permanent maxillary right central incisor.

Etiology:

Etiology of fusion is diverse and obscure. Evolution, trauma, heredity and environmental factors are considered responsible for fusion.¹³ Some researchers believe that this anomaly develops when the adjacent tooth bud come very close to each other by resorption of the interdental bone then,²⁰ as they grow, they come into contact and fuse before calcification.¹³ Where as other investigators believe that adjacent tooth germs come in contact with each other due to physical pressure of force generated during growth.²¹ Spouge proposed that crowding of adjacent tooth germs may result in fusion.⁹

Incidence:

Fusion is more common in deciduous dentition (0.5%) than the permanent (0.1%).^{14,17,22} Its incidence is higher in anterior maxillary region.¹⁷ Fusion between supernumerary and permanent teeth occurs less frequently than fusion between other types of teeth.²³

Clinical Case:

A 15 year old male adolescent reported to the Dept of Orthodontics with the chief complaint of spacing with anterior teeth.

Clinical examination revealed presence of full complement of teeth in the upper and lower arch except third molars in all the four quadrant. The only other tooth missing was upper right canine. The occlusion represented Class I molar relationship with increased overjet and overbite. The upper and lower midline were coinciding. Fusion was seen with maxillary right central incisor with supernumerary tooth.

To carry out further investigations, IOPA was advised which revealed maxillary right canine to be impacted. The IOPA confirmed the fusion. It shows the complete fusion of the crown and root

structure of mesiodens as well as maxillary right central incisor. SLOB technique was used to confirm the fusion. Similarly root canals of both the teeth are separate. Management with a multidisciplinary approach was planned. It was decided to separate the mesial and distal tooth and extract the distal side even though it was normal in size. After bone grafting the orthodontic treatment was planned to mesialize the lateral incisor making space for the canine and after the surgical exposure of canine, it was supposed to be brought into alignment.

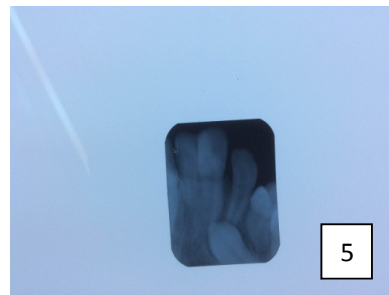
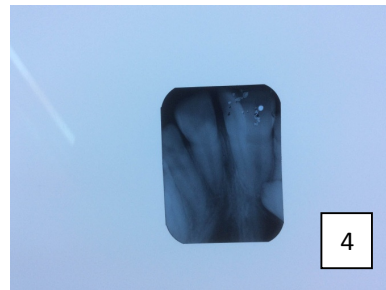
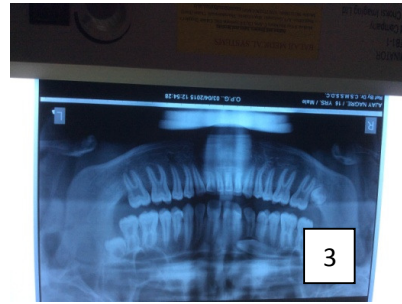
Various treatment approaches:

Various treatment modalities have been described in the literature with respect to the different presentations, locations and morphological variations of fused teeth. A multidisciplinary approach is needed for management of such a condition. The treatment usually involves periodontics, endodontics, selective grinding, surgical separation or extraction followed by prosthesis and/or orthodontics to achieve favourable results.^{24,25} Ferreira-Junior et al,²⁶ Tsujino and Shintani,²⁷ Cetinbaset al.²⁸ Clem and Natkin²⁹ reported sectioning of the fused teeth and extraction of the supernumerary tooth. Ghodduset al³⁰, Nunes et al²⁵ and Song et al³¹ treated fused teeth with non-surgical endodontic approach. Good and Berson²⁴ reported a case in which they removed the complete crown and a section of the root of a labially positioned supernumerary tooth to the level of CEJ. Rani et al²³ managed the case of fused teeth with multidisciplinary approach whereas Tuna recommended immediate replantation of tooth after extra-oral hemisection.²²

Conclusion:

Dental anomalies are the commonest type of development anomalies. When present they hamper the aesthetic and functional value. Management of such condition require a multidisciplinary approach

involving two or more dental faculties. This case shows that fusion though a rare entity is highly prevalent in maxillary anterior region and compromises aesthetics. Efforts must be directed to understand this anomaly and manage it successfully to avoid treatment complications.



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