Concrescent triplets involving primary anterior teeth

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Abstract

Odontogenesis is a complex process wherein more than 200 genes are known to play a significant role in tooth development. An imbalance can lead to an abnormality in the number, size, shape or structure of the developing tooth/teeth. The presence of an extra dental lamina forms a supernumerary tooth. The supernumerary teeth are of two types: A rudimentary tooth where the supernumerary tooth does not resemble any tooth in the normal series or a supplemental tooth in which this anomalous tooth resembles one in the normal series. It is also very rare to encounter triple teeth in primary dentition. The union of these teeth may be through fusion, gemination, concrescence or a combination of fusion and gemination. Presented is a rare case of concrescence involving maxillary deciduous incisors and a supplemental tooth in a 7-year-old boy. The differential diagnosis, etiology, and complications of primary anterior triple teeth are discussed.

Keywords: Concrescence, fusion, gemination, supplemental primary tooth, triple teeth

Introduction

The developmental disturbances affecting the shape of tooth include gemination, fusion, and concrescence. “Gemination” is an attempt at division of a single tooth bud by an invagination with incomplete formation of two teeth whereas fusion is union of two or more teeth.[1] The number of teeth is reduced by one or more in fusion and the same remains unaltered in gemination. The epithelial and mesenchymal germ layer is affected in both gemination and fusion. Concrescence is cemental union of teeth which affects only the mesodermal layer[2] and may be diagnosed only post-extraction.

Conjoined triplets are rare with a prevalence of 0.02%.[3] These may be joined through fusion, gemination, concrescence or a combination of fusion and gemination. Primary triplets involve maxillary incisors[4] or rarely, mandibular incisors.[5] The union may involve incisors only,[6] or incisors and a supernumerary tooth.[4] Although, union of two teeth by concrescence is reported in permanent[7] and primary teeth,[8] three such teeth, involving primary maxillary incisors and a supplemental incisor, are very rare.

Case Report

A 7-year-old boy complained of palatally erupting upper front tooth and a retained primary tooth. An examination revealed palatal eruption of permanent maxillary left central incisor. Also, visible was an erupted supplemental tooth bearing resemblance to a miniature incisor. It was present between the deciduous maxillary left central and lateral incisors (61 and 62 respectively – Fédération Dentaire Internationale (FDI) notation). The teeth 61 and 62 were carious and lacked mobility. Also, the tooth 61 was black in color. History revealed trauma to the upper anterior region when the child was 1 year of age. He had fallen face forwards while waddling. Medical and family history was non-contributory.

A radiograph revealed cariously infected 61 and 62 with a supplemental tooth in between [Figure 1]. It was decided to extract all the three teeth taking into consideration age of the child, presence of infected teeth and eruptive status of succedaneous teeth. Attempts at removal of a single tooth resulted in extraction of all the three teeth en bloc. Examination revealed that these teeth were joined together by the roots [Figures 2 and 3].

The specimen was thereafter, sent for histopathology. The teeth were decalcified in 3% nitric acid and the prepared sections (5 µm) stained with hematoxylin and eosin. The sections revealed the union of teeth by cementum [Figures 4 and 5].

Discussion

A differentiation of fusion, gemination and concrescence is essential. A missing primary tooth in case of triple teeth indicates fusion of primary teeth. A missing permanent
tooth is suggestive of partial anodontia; or fusion of primary incisors and a permanent tooth. Absence of any missing tooth is indicative of fusion involving primary incisors and a supernumerary tooth; or a combination of fusion and gemination of primary teeth. Gemination is seen as a bifid crown but usually has a single pulp chamber and a single identifiable root canal.

In the present case, well-demarcated grooves separated the crowns of incisors and supernumerary tooth when viewed from the labial and lingual aspect of extracted triple teeth. Moreover, mesial caries on both the incisors made it difficult to evaluate enamel fusion, if any. A radiographic image also confirmed separate pulp chambers and root canals of all the three teeth. Also, there was no missing primary or permanent tooth. Thus, the possibility of fusion is ruled out.

Fusion and gemination involve a confluence of dentin whereas concrescence involves union by cementum only. In our case, union was by cementum in the cervical-middle third of the roots and dentin of the teeth was separate. Also, morphological topography of the roots of triplets was distinguishable post-extraction which is indicative
of complete root formation prior to union. The union by cementum was also confirmed histologically. Although, the etiology of concrescence is largely unclear, trauma, crowding of teeth, excessive occlusal forces, periradicular infection, proximity of roots, systemic diseases, and genetic factors are some of the factors.[1]

Concrescence is classified as developmental or true if it occurs before root formation when roots of the adjacent teeth are in close proximity; and post-inflammatory or acquired if it occurs after chronic inflammation in relation to a non-vital tooth.

Clinical detection of concrescent teeth is often difficult as radiographs usually fail to detect them. It is recommended that radiographs be taken at varied angulations with different exposure guidelines.[10] It is unusual to find the union of primary maxillary incisors and a supplemental incisor by cementum. The reported prevalence of a supplemental tooth in the deciduous dentition is 0.3-0.8%.[4]

The present case had carious infected teeth and the etiology of concrescence is likely post-inflammatory in nature. The close proximity of roots of triple teeth along with an excessive cementum formation during repair of periradicular lesions might have resulted in resorption of the interdental bone thus, triggering union by cementum. Also, trauma sustained to the tooth 61 in early life, during the period of root formation, might have resulted in early cemental union of these three teeth. Hence, in the present case, the etiology of concrescence is multifactorial.

Triple teeth complicate endodontics, oral surgical procedures, and periodontal treatment apart from being unaesthetic. Primary triple anterior teeth may prevent or delay eruption of succedaneous and adjacent teeth, cause ectopic eruption, root deviation or root resorption of adjacent teeth.[4] In the present case, the permanent tooth bud was displaced palatally, thus increasing the possibility of anterior cross bite. Attempts at removal of a single tooth will facilitate removal of other teeth involved by concrescence which was so in this case as well. The heroic efforts to extract triple teeth, particularly when permanent molars are affected can lead to jaw fractures or oro-sinus communications.

The occurrence of three concrescent primary anteriors is very rare. Concrescence should be suspected if the roots of retained primary anteriors are in close proximity and are accompanied by a cariously infected pulp with or without a previous history of trauma. A clinical and multiple-angled radiographic examination of the conjoined triplets may establish the diagnosis. An appropriate treatment plan has to be decided thereafter, to minimize the risk of complications.

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