



FAMILIAL OCCURENCE OF MULTIPLE SUPERNUMERARY TEETH AMONG CLOSE RELATIVES; CASE REPORT

Beste Kamiloglu

Department of Orthodontics, Faculty of Dentistry, Near East University, Near East Boulevard, North Cyprus

ABSTRACT

A supernumerary tooth is one that exceeds the normal dental formula and can occur in single or multiple form. It can be found in almost any region of both jaws; erupted or impacted and may be encountered as a chance finding, on a radiograph or erupt spontaneously. Prevalance of supernumerary teeth is 2:1 among men to women. The etiology is not completely known but besides environmental factors familial trait and heredity play an important role at the occurrence of this numerical anomaly. One or two extra teeth are common but multiple supernumerary teeth is a rare disorder. Supernumerary teeth may be present with several syndromes but are mostly associated with Cleidocranial Dysplasia, Gardner Syndrome and cleft lip and palate. This article points out the genetic origin of non-syndromic multiple supernumerary teeth among close relatives.

KEYWORDS : Familial Trait, Genetics, Mesiodens, Supernumerary Teeth.

BACKGROUND

Hyperdontia is an odontostomatologic anomaly which refers to increased number of teeth in primary or permanent dentition, common among populations all over the world. Supernumerary teeth occur more frequently in patients with a family history. The anomaly appears 2:1 ratio in men compared to women. Even only one excess tooth may affect normal occlusal development and functional problems may arise (Bahreman). Although the etiology is not clear it's believed to be multifactorial with interaction of both environmental and genetic factors. Supernumerary teeth may be present with several syndromes but are mostly associated with Cleidocranial Dysplasia, Gardner Syndrome, trichorhino phalangeal syndrome or in patients with cleft lip and palate. It can also be present in patients without any systemic pathology. However, it's rare to find multiple supernumeraries in individuals with no other associated diseases or syndromes. Their prevalence oscillates to 0.5-3.8% in patients with permanent teeth and 0.35-0.6% in patients with primary dentition (Montenegro). Several theories have been suggested among which local, independent, conditioned hyperactivity of dental lamina theory is the most accepted cause. It's more likely to arise in patients whose families have a history of increased tooth number. However, the anomaly does not follow a simple Mendelian pattern (Yusof). Yusof reviewed case reports from 1969 to present and found that multiple supernumerary teeth without any associated systemic conditions or syndromes are not common. The occurrence of multiple supernumerary teeth in a family is described as a non-syndromal trait. The autosomal dominant transmission of non-syndromal multiple supernumerary teeth is new (Von Arx). The prevalence of supernumerary teeth in the premolar region has been reported as 0.2-10.9% by various researchers. They are most likely to develop in the mandible rather than the maxilla and are usually eumorphic. The upper and lower canines and lower lateral incisors are rare supernumeraries. Supernumerary primary teeth are mostly midline mesiodens or supplemental lateral incisor and show less variety in shape.

Primosch classified supernumeraries according to their shapes in two types: Supplemental (eumorphic); hyperdontia with normal shape, size and is termed as incisiform. Rudimentary (dysmorphic); abnormal shape, smaller size, conical, tuberculate and molariform types. Inversion of conical-shape is not common.

The most common supernumerary tooth which appears in the maxillary midline is called a mesiodens; usually located in the premaxilla of which 90-98% is located in palatal position between upper central incisors and mostly uninverted.

Mesiodens may be encountered as a chance finding on a radiograph or as the cause of an impacted central incisor or may make spontaneous eruption. Most problems associated with mesiodens are related to altered growth and development in the area. Common sequelae include over retention of primary teeth, delayed eruption or impaction of permanent teeth, dilaceration or abnormal root development, abnormal crowding or spacing of the anterior teeth (Henry). Mesiodens have been impeding the eruption of upper central incisors, affecting all school children psychologically.

Detection of supernumeraries is achieved with a meticulous clinical and radiographic examination. Anterior occlusal or periapical radiograph is helpful to examine a specific region in detail. Early clinical and radiographic assessment is of paramount importance in diagnosis and treatment planning to prevent associated problems. Whenever a single supernumerary tooth is detected orthopantomograph is advisable to rule out the presence of multiple supernumerary teeth (Wankhade). The buccolingual position of the intrabony supernumerary teeth can be located using parallax technique also known as horizontal tube shift technique (Houston).

Case Presentation

Case 1:

A 8 year old caucasian girl was referred to the orthodontic clinic with the main complaint of delayed eruption of permanent maxillary central incisors compared with her classmates. She was in a negatively affected mood. The patient was then diagnosed with non-syndromic multiple supernumerary teeth. She was the first child of a nonconsanguineous marriage without inherited peculiarities. Her family showed limited contribution about their medical and dental history: Case 3 is the nephew of case 1 who had one sided, multiple mesiodens.

Oral Findings

Oral examination revealed that the patient was at early mixed dentition and permanent teeth eruption age was not compatible with her chronological age. Only two mandibular permanent first incisors were existing in her mouth. Maxillary persistent deciduous incisors were consistent without any sign of root resorption. This patient showed late permanent teething corresponding to her chronological age similar to her nephew and unlike her sibling who has revealed uncommon permanent teething order.

Radiographic Findings

Considering that a mesiodens may be responsible for delayed eruption of permanent incisors the child was subjected to panoramic radiograph which revealed a total of

10 supernumerary teeth. Besides existence of two sided mesiodens, multiple supernumerary teeth was noticed of which were completely bony impacted: In addition to mesiodens, 2 supernumerary laterals each in the left and right mandibular incisor region, 3 mandibular parapremolars of which 2 at right premolar region and 1 at left premolar region; a total of 2 supernumerary canines in the left and right maxillary canine region, 1 supernumerary lateral incisor tooth at right maxillary region were detected. On radiographic examination the abnormal, intraosseous eruption pattern of the developing mandibular second molars was noteworthy (Figure 1a,b).



Figure 1. a,b. Initial and progress radiographies of case 1.

Treatment

The proposed treatment plan included the removal of all unerupted, bony impacted supernumeraries by surgical intervention. The operations were expanded to long time periods. The treatment started with the extraction of the retained deciduous maxillary incisor teeth and canines. After 10 months a new panoramic radiograph was taken. Important but insufficient teeth movement was observed; both mesiodens and maxillary central incisors forwarded spontaneously maintaining intrabony root development of permanent incisors. The bonding of the upper arch with Roth brackets was maintained. Bilateral, completely bone impacted, palatally located, dysmorphic, tuberculate shaped mesiodens without root formation were removed during the operation. First orthodontic treatment continued for 12 months which performed the eruption of all maxillary anterior teeth. After the removal of fixed orthodontic appliances palatal retainer was bonded to the maxillary anterior teeth. Second phase of treatment was started after 2 years passed over the initial treatment: Fixed orthodontic treatment and the removal of all extra teeth completed in 5 years' period. Lower left second molar with abnormal eruption pattern had been erupted successfully with fixed orthodontic approach but lower right second molar has been left in situ because of patient's negative reaction to further treatment. Fixed orthodontic treatment had to be lasted earlier than planned because of patient's serious apprehensive behaviour.

Case 2:

Second patient was the sibling of case 1, at whom hyperdontia was expected with prediction of familial trait. Starting from early teething period a thorough, manual, observative intraoral examination was made because of the high probability of autosomal dominant transmission of supernumerary teeth.

Oral Findings

Intraoral examination was made when she was 3 years old and maxillary left uninverted, supplemental, erupted primary supernumerary canine was detected. When she was 11 years old a specific eruption pattern was detected; late erupting first molars and early erupting canines and premolars compared to her chronological age.

Radiographic Findings

Initial radiographic examination of this patient was made at the age of 6. She was at early age of mixed dentition. A sum of 6 permanent supernumerary teeth was detected; 1 upper left, uninverted, eumorphic canine; 2 sided, bony impacted mesiodens; 1 mandibular right sided supernumerary lateral and two sided supernumerary canines

(Figure 2a). This child displayed advancement of eruption of both deciduous and permanent dentition outside the limits of normal variation and surprisingly late erupting first molars.

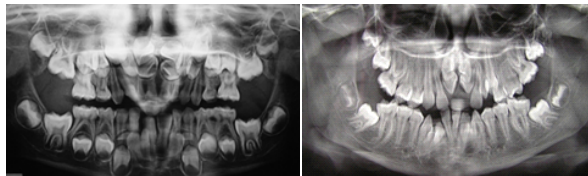


Figure 2a,b. Initial and progress radiographies of case 2

Treatment

Because of this patient's extraordinary teeth eruption a different orthodontic treatment approach was maintained. The extraction of 6 maxillary anterior deciduous teeth and waiting for the forwarding of both mesiodens and permanent incisors. 2 years later new panoramic radiograph was obtained and it was noteworthy that both mesiodens and permanent first incisors' intrabony movements towards the dental arch were excellent but surgical removal was necessary. Full-mouth fixed orthodontic treatment had been started at age 10.

Case 3:

This patient was a 10 year old caucasian boy, who was the nephew of cases 1 and 2. His main complaint was uneruption of permanent maxillary left central incisor with a huge space existing. He was the only child of a nonconsanguineous marriage. His family was insufficient in contribution about his medical and dental history but the patient's father gave the information of " numerous teeth extraction when he was young".

Oral findings

Intraoral examination showed early stages of mixed dentition, not compatible with his chronological age.

Radiographic Findings

Radiographic examination disclosed maxillary left rudimentary, uninverted, single mesiodens (Figure 3a). Developing intraosseous supernumerary wisdom teeth (distomolars) were detected at the subsequent panoramic radiograph(3b).

Treatment

Surgical removal of bony impacted, unilateral mesiodens had been decided. Only 1 mesiodens was expected but 2 uninverted, dysmorphic mesiodens were detected during the operation.

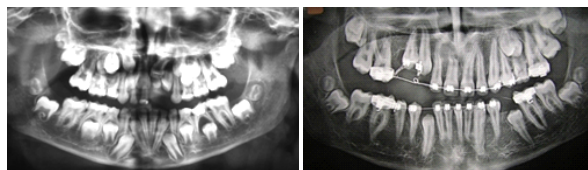


Figure 3a,b. Initial and progress radiographies of case 3.

DISCUSSION

Supernumerary teeth is defined as increased number of teeth to the normal human dentition which are common among populations and occur more frequently in patients with family history of hyperdontia. Present cases non-syndromic multiple supernumerary teeth with evident penetrance of the phenotype in the family unit engaged in the present study. The karyotype determination is useful for excluding a chromosomal pathogenesis on chromosomal basis. Inchingolo at al. presented in a study on mother and three children that autosomal dominant transmission of hyperdontia in varying degrees, vertical and gender-independent transmission in non-syndromic patients is

possible. They may be in similar morphology to a normal tooth (eumorphic) or frequently they don't show a resemblance (dysmorphic). However it is rare to find hyperdontia in individuals with no other associated diseases or syndromes. The upper and lower canines and lower lateral incisors are rare supernumeraries. In this case report this rare condition was detected. Many theories have been already proposed, such as the phylogenetic process of atavism and the dichotomy of the tooth bud. The most accepted theory which is supported in the literature suggests that hyperdontia results from localized and independent hyperactivity within the dental lamina, which leads to the formation of additional dental buds (Fazliah). It has been suggested that supernumerary teeth develop from a third tooth bud which arises from the dental lamina near the permanent tooth bud, or possibly from the splitting of the permanent tooth bud itself (Byahatti). Supernumerary teeth may cause delayed or impaired eruption of succedaneous teeth (26-52%), crowding, displacement or rotation of permanent teeth (28-63%), abnormal diastema or premature space closure, dilaceration or abnormal root development of permanent teeth, cyst formation (4-9%), or eruption into nasal cavity (Mitchell).

Detection of hyperdontia is best achieved by a thorough clinical oral examination and by careful radiographic observation; before deciding the removal or keeping in situ of the supernumeraries, it is necessary to enumerate, to identify the type, position, effects to the neighbouring teeth. CBCT appears to be an excellent diagnostic tool, providing three dimensional information and accurate images, especially for diagnosis of impacted mesiodens (Kim). At the present cases none of the patients' relatives accepted CBCT with the reason of extra radiation. In cases 1 and 2 early intervention with interceptive orthodontic treatment approaches allowed us to establish a satisfying teeth alignment and occlusion.

In the present cases siblings with multiple supernumerary teeth were both non-syndromic. The etiology of supernumerary teeth is poorly understood but at this series of hyperdontia familial trait is obvious.

CONCLUSION

The etiology of hyperdontia still remains unknown. The inheritance pattern in the mentioned three cases indicates the importance of genetics in supernumerary teeth. Radiographic monitoring is at utmost importance when there is a suspicion and possibility of hyperdontia. An early diagnosis reduces the risk of complications because of hyperdontia.

The present cases also confirm that decision to surgical or non-surgical treatment approach to multiple supernumerary teeth are due to different eruption patterns.

Consent

Written informed consent was obtained from all patients' parents for publication of these case reports and any accompanying images. A copy of the written consent is available for review by the Editor of this journal if recommended.

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Author details

Assistant Professor, DDS PhD, Department of Orthodontics, Faculty of Dentistry, Near East University, Near East Boulevard, Nicosia-Cyprus.

* 59beste@gmail.com, beste.kamiloglu@neu.edu.tr

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