MESIODENS: AN ETIOLOGY OF SEVERE MALOCCLUSION

ABSTRACT

Supernumerary tooth (ST) is a developmental anomaly and has been argued to arise from multiple etiologies. These teeth may remain embedded in the alveolar bone or can erupt into the oral cavity. When it remains embedded, it may cause disturbance to the developing teeth. The erupted supernumerary tooth might cause aesthetic and/or functional problems especially if it is situated in the maxillary anterior region. A case of supernumerary teeth is presented where the teeth have been left in place and which later gave rise to some problems. The patient had requested orthodontic treatment for the misalignment of his anterior teeth. The treatment options are further discussed.

KEYWORDS

Supernumerary teeth, Mesiodens, Class II malocclusion, Esthetics, Severe rotations

INTRODUCTION

Nance described dental crowding as the difference between spaces needed in the dental arch and space available in that arch that is the space discrepancy. Thus crowding or spacing can be described as an expansion of an altered tooth/tissue ratio or as dentoalveolar disproportion. The causes of crowding are however, still not fully understood. Hootan suggested that crowding was probably the result of an evolutionary trend toward a reduced facial skeletal size without a corresponding decrease in tooth size. Brash said that crowding was hereditary. The result of interbreeding in ethnic groups that environmental factors were more important then genetic factors.

Supernumerary teeth are one of the common etiological factor in dental crowding. A supernumerary tooth is a term used to describe more than the normal number of a full complement of teeth in either the primary or permanent dentitions. Most common supernumerary teeth is mesiodens. Prevalence of mesiodens in children varies from 0.15-3.8%. Mesiodens may cause a wide range of associated problem ranging from median diastema, a delay in eruption of permanent central incisors, alteration of the position of permanent incisors, root resorption, dentigerous cyst formation and severe rotations and crowding of incisors.

CASE SUMMARY

A male patient of age 24 years came to the Department of orthodontics with the chief complaint of rotated teeth in the upper front region. He had mesoprosopic face type & mesocephalic head with no facial asymmetry. A convex profile with straight divergence, acute nasolabial angle and deep mentolabial sulcus with competent lips were noted. Intra oral examination revealed that he had permanent dentition with mesiodense and severe crowding in the maxillary region 11 and 12 showed 900 rotation in opposite direction. Maxillary and mandibular arches were U-shaped with mild crowding in mandible arch. He had Angle's class II molar relationship, an overjet of 3 mm and over bite of 4 mm. The cephalometric analysis showed mild proclination of upper & lower incisors with mild skeletal class II relationship because of mandibular retrusion (SNA-84°, SNB-78°, ANB-6°). The mandibular plane angle (GoGn-SN – 25°, FMA-20°) indicates hypo divergent growth. Arch perimeter and Carey's analysis showed tooth material excess in maxillary arch by 8mm and in mandibular by 2mm. The patient was diagnosed as Angle's class II Division I malocclusion on class II skeletal bases due to mild mandibular retrusion having hypodivergent growth pattern with severe crowding in maxillary anterior region due to mesiodense.

The goal of orthodontic treatment was to correct crowding in the maxillary arch while maintaining the molar. It was decided to extract mesiodense and both first premolar in maxillary arch.

TREATMENT PROGRESS

Orthodontic treatment was started with 0.018” slot Preadjusted Edgewise MBT system. Banding was done for 11 and 12 instead of bonding to derotate the teeth so that the bonding will be facilitated in the later stages. An initial 0.016” round NiTi arch wire was placed. Canines were retracted initially to gain space and open coil spring was placed between 11 and 12 for rotation correction. It was followed by 016 x 022” NiTi wire, used for alignment & levelling of both arches for 3months. Space consolidation was started with 0.016 x 0.022” S-S wire using friction mechanics and continued for a period of further 5 months. Finishing and detailing was done by 0.017” x 0.025” NiTi followed by 0.017” x 0.025” S-S wire for 2 months. Active treatment was around 12 months. At the end of the treatment molar relation was maintained, normal overjet and overbite were achieved. Retention was given for a period of 9 months using removable Hawley's retention appliance.

DISCUSSION

Development of the tooth is a continuous process with
a number of physiologic growth processes and various morphologic stages interplay to achieve the tooth’s final form and structure. Interference with the stage of initiation, a momentary event, may result in single or multiple missing teeth (hypodontia or oligodontia respectively) or supernumerary teeth. A supernumerary tooth is one that is additional to the normal series and can be found in almost any region of the dental arch. The term mesiodens denotes a supernumerary tooth located between the maxillary central incisors 1.

The aetiology of the ST however remains unclear. Several theories have been suggested for their occurrence such as the ‘phylogenetic theory’, the ‘dichotomy theory’, a hyperactive dental lamina and a combination of genetic and environmental factors - unified etiologic explanation 2.

The ‘phylogenetic theory’ relates to the phylogenetic process of atavism (evolutionary throwback) has been suggested. Hyperdontia is the result of the reversional phenomenon or atavism. Atavism is the return to or the reappearance of an ancestral condition or type.

The ‘dichotomy theory’ is where a supernumerary tooth is created as a result of dichotomy of the tooth bud. The supernumerary tooth may develop from the complete splitting of tooth bud 3. The tooth bud splits into two equal or different-sized parts resulting in two teeth of equal size or one normal and one dysmorphic tooth, respectively.

A hyperactive dental lamina where the localized and independent hyperactivity of the dental lamina is the most accepted cause for the development of the supernumerary teeth; it is suggested that supernumerary teeth are formed as a result of local, independent, conditioned hyperactivity of the dental lamina 4. According to this theory, the lingual extension of an additional tooth bud leads to a eumorphic tooth, while the rudimentary form arises from proliferation of epithelial remnants of the dental lamina induced by pressure of the complete dentition 5. Hattab and co-workers tend to believe that hyperdontia is a disorder with pattern of multifactorial inheritance originating from hyperactivity of dental lamina. Remnants of the dental lamina may exist as epithelial pearls or islands, “rests of Serres” within the jaw. If the epithelial remnants are subjected to initiation by induction factors, an extra tooth bud is formed resulting in the development of either a supernumerary tooth or odontome.

It is essential not only to enumerate but also to identify the supernumerary teeth (ST) present clinically and radiographically before a definitive diagnosis and treatment plan can be formulated 6. Mesiodens may often cause retardation or obstruction of eruption of permanent incisors. Early diagnosis and extraction of a mesiodens may prevent malocclusion and dental abnormalities such as delayed eruption of permanent incisors, rotation of the permanent incisors and diastema 7.

In this case we observed that mesiodens caused severe rotations which hampered the esthetics severely. After treatment the results showed properly aligned arches with pleasing esthetics for which patient was completely satisfied.

REFERENCES