

## **Treatment of Pediatric Patient with Multiple Supernumerary Teeth along with Single Tooth Crossbite and Proclination in 21 Corrected with 2 X 6 Fixed Appliance Therapy: A Case Report**

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### **Abstract**

A ten year old patient who presented with supernumerary teeth palatally behind the maxillary central incisors and the consequential orthodontic problems (crossbite and proclination) as a result of the supernumerary teeth was treated with a 2X6 fixed orthodontic appliance. This fixed orthodontic therapy corrected the crossbite and proclination in a short duration (3 months) of time.

**Keywords:** *Supernumerary Teeth; Hawley's Appliance; 2X6 Fixed Orthodontic Appliance*

### **Introduction**

Supernumerary teeth are those that exceed the normal dental formula [1]. This phenomenon is also known as hyperdontia and can occur in solitary or multiple form, may be unilateral or bilateral, and affect one or both sides maxilla's [1,2]. These teeth are more prevalent among men than women in a proportion of 2:1. The prevalence of supernumerary teeth is 0.3 - 0.8% in deciduous dentition and 1.5 - 3.5% in permanent dentition [1,3]. Rao and Chidzonga stated that the etiology of supernumerary teeth is multifactorial, a combination of environmental and genetic factors [3]. The most commonly explained etiology is phylogenetic or tooth germ dichotomy.

### **Supernumerary teeth**

A supernumerary tooth is an additional tooth to the normal set of teeth. It may closely resemble the teeth of the group to which it belongs, i.e. molars, premolars or anterior teeth, or it may bear little resemblance in size or shape to the teeth with which it is associated. It has been suggested that supernumerary teeth develop from a third tooth bud arising from the dental lamina near the permanent tooth bud, or possibly from splitting of the permanent bud itself. Another theory, well supported in the literature, is the hyperactivity theory, which suggests that supernumeraries are formed as a result of local, independent, conditioned hyperactivity of the dental lamina. In some cases there appears to be a hereditary tendency for the development of supernumerary teeth. The most common supernumerary tooth is the mesiodens, a tooth situated between maxillary central incisors, which is followed by maxillary fourth molar, called distomolar and is usually a small rudimentary tooth. Paramolar is the one which is formed usually buccal or lingual to the maxillary molars or in between the maxillary first and second molar. Multiple supernumerary teeth are rare in individuals with no other associated diseases or syndromes.

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The conditions commonly associated with an increased prevalence of supernumerary teeth include cleft lip and palate, cleidocranial dysplasia, and Gardner syndrome [4].

### Classification

Supernumerary teeth can be classified according chronology, location, morphology and orientation. Garvey, *et al.* [1] classify them as single or multiple. Single supernumerary teeth are classed on the basis of their morphology as conical, tuberculate, supplementary and odontomas, the latter being composite or complex. Primosch classified supernumerary teeth as two types according to shape: supplementary or rudimentary; supplementary or eumorphic are those that have a normal shape and size, rudimentary or dysmorphic have an abnormal shape and smaller size and maybe conical, tuberculate or molariform [5].

According to the location of supernumerary teeth, they can be classified as mesiodens [situated at the midline], paramolar [situated vestibularly between the second and third molars, and distomolar [situated distally of the third molar]. They may show vertical, inverted, or transversal orientations [6].

The most common supernumerary teeth present conical morphology, most usually situated between the upper central incisors [6]. One study observed that the supernumerary tooth of conical morphology was the most common [44.5%], followed by tuberculate [38.7%] and supplementary [16.7%] [7]. These data concur with results published by Kara, *et al.* [8] [47.3%, 39.9% and 12.8%, respectively] and by Ramesh, *et al.* [79.74%, 9.75% and 7.31%, respectively] [9]. However, other studies have obtained prevalence data that vary from 31% to 75% for conical, 12 - 28% for tuberculate, and 4 - 33% for supplementary teeth [10,11].

It is rare for hyperdontia to occur in isolation; it is usually associated with some other disorder such as harelip, cleft palate, or syndromes such as Gardner syndrome, Down syndrome, cleidocranial dysplasia, Zimmerman-Laby syndrome or Noonan syndrome [12]. A study of 205 patients with harelip and cleft palate found a frequency of supernumerary teeth of 11.7% [13]. Several other studies have observed cases of cleidocranial dysplasia with the presence of supernumerary teeth [14,15]. The gene responsible for cleidocranial dysplasia is the RUNX2 and mutations of this gene could explain the existing correlation between the syndrome and the presence of supernumerary teeth [16].

### Case Report and Discussion

A 10 year old male child came to the department of pediatric dentistry in our institution with a chief complain of extra teeth in the front portion of the upper jaw. On intraoral examination it was found that there were two conical supernumerary teeth which were present lingual to maxillary central incisors (11, 21) (Figure 1). On intraoral examination it was also found there was single tooth crossbite in relation 12 and 42 and proclination in relation to 21 and retroclination in relation to 32 (Figure 2 and 3). His molar relation was class I molar relationship bilaterally. On radiographic examination the roots of 11 and 21 were fully formed and calcified (Figure 4). It was also found that proclination of 21 was due to the pressure exerted by the supernumerary teeth present palatally. On taking the medical and personal history no one in his family had supernumerary teeth. So, it was not hereditary.

### Extraction of supernumerary teeth

The treatment planned for the supernumerary teeth were according to the guidelines given by Rao and Chidzonga who stated that extraction of supernumerary teeth should be done at the age of 8 to 10 years when the roots of the maxillary central incisors have formed completely [3]. Since our patient was of 10 years of age and on radiographic examination it was found that the roots of the maxillary incisors have been formed completely. The supernumerary teeth were extracted (Figure 5 and 6). The patient was advised to come after



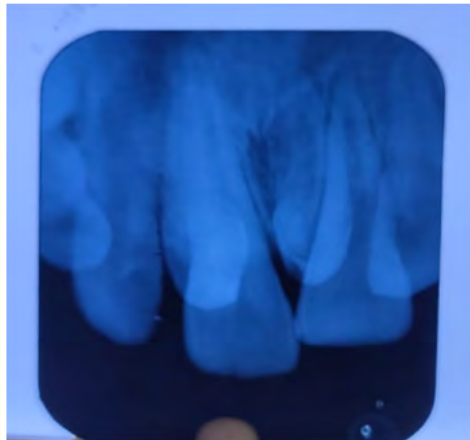
**Figure 1:** Supernumerary teeth present palatal to 11, 21.



**Figure 2:** Crossbite in relation to 12, 42 and proclined 21.



**Figure 3:** Retroclination in relation to 32.



**Figure 4:** Showing supernumerary teeth and completely formed roots of 11, 21.

1 month for his orthodontic treatment. Removable appliance that is Hawley's with Z spring and posterior bite plate was given and patient was asked to come after every month for follow up (Figure 7). The patient was observed for 3 months and no change in the cross bite relation with respect to 12, 42 was seen so fixed appliance therapy was planned.



**Figure 5:** Extraction of supernumerary teeth.



**Figure 6:** Extracted supernumerary teeth.



**Figure 7:** Hawley's appliance with Z spring and posterior bite plate.

### 2 X 6 fixed appliance therapy

MBT bracket were placed in relation to 11, 12, 13, 21, 22 and 0.12 Niti wire was placed for 1 month followed by 0.14 and 0.16 each month (Figure 8). Hawley's with posterior bite plate was placed in the lower jaw to disocclude the jaw. After 3 months cross bite and proclination got corrected. Brackets and molar bands were removed followed by topical fluoride application and retainer was given and patient was recalled after every month for follow up (Figure 9).



**Figure 8:** 2 x 6 fixed orthodontic appliance.





**Figure 9:** Post treatment.

### **Conclusion**

In children in mixed dentition period when there is crossbite or proclination of teeth fixed orthodontic therapy is a better treatment option than removable appliance therapy for minor orthodontic correction.

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