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Original Research

Prevalence of dental ankylosis in primary molar

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ABSTRACT:
Background: To evaluate the prevalence of dental ankylosis in primary molar. **Materials & methods:** A total of 40 primary molars were enrolled. The age of patients was 6 to 9 years. 15 were girls and 10 were boys. Radiographic examination was done. The diagnosis was informed by the presence of different degrees of infraocclusion and the appearance of adjacent bone (the loss of periodontal space). Data was collected and result was analysed using chi- squared test and SPSS software. **Results:** A total of 40 primary molars were enrolled. According to location, ankylosed teeth were more in the lower jaw as 92.5% as compared to the upper jaw i.e 7.5%. The third quadrant has the more number of ankylosed tooth i.e 55% followed by fourth quadrant i.e 37.5%. **Conclusion:** The prevalence of dental ankylosis was higher in the third quadrant, especially in the first primary molars.
Keywords: dental ankylosis, primary molar, prevalence.

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INTRODUCTION

Dental ankylosis is an eruptive abnormality characterized by the fusion between the dentin or the cementum of the root and the surrounding bone, with the obliteration of the periodontal ligament that will be progressively replaced by bone tissue. [1] It can occur in any stage of tooth eruption, either before the complete eruption in the oral cavity (primary retention) or after the tooth has reached the occlusal plane (secondary retention). [2] The cause of ankylosis is not known although in some cases trauma, infection, disturbed local metabolism or a genetic influence has been considered as an important etiologic factor. These influences have been discussed by Henderson who has also emphasized that a patient having one or two ankylosed teeth is very likely to have other teeth ankylosed over a period of time. [3] This condition is usually treated by surgical removal of the ankylosed teeth so as to prevent the development of maloc-clusion, local periodontal disturbances, or dental caries. [4]

The frequency of ankylosed teeth has been reported to be between 1.3% and 38.5%. [5] The mandibular first primary molars are the most frequently affected teeth, followed by second mandibular and maxillary primary molars. The exact cause of teeth ankylosis is still unknown, but several theories have been proposed such as familial pattern, traumatic injury to Hertwig's epithelial root sheath, deficiency in bone growth, a problem in local metabolism and inflammation, localized infection, and chemical or thermal irritations. [6] Ankylosis is classified as slight, moderate, or severe according to the place of the occlusal level of the infraoccluded tooth. If the infraocclusion is less than 2 mm, it shows slight ankylosis, while moderate submergence shows the occlusal surface of the ankylosed tooth to the contact area. Severe ankylosis shows infraocclusion below the contact area of the adjacent teeth. [7] Diagnosing ankylosed teeth is not difficult and is usually based on clinical signs and radiographic findings. Clinically, ankylosed teeth have a sharp, solid sound on a percussion test in comparison to a cushion sound in normal teeth. [8]

Ankylosis of deciduous molars has a negative impact on normal occlusal development and may cause

problems such as significant tipping of adjacent teeth to the area of the submerged tooth, which may cause a reduction in arch length, especially when severe ankylosis of second primary molars occurs in early mixed dentition, [9] ectopic eruption or impaction of successor premolar; and the increase in caries and periodontal disease susceptibility. [5] Hence, this study was conducted to evaluate the prevalence of dental ankylosis in primary molar.

MATERIALS & METHODS

A total of 40 primary molars were enrolled. The age of patients was 6 to 9 years. 15 were girls and 10 were boys. Radiographic examination was done. The diagnosis was informed by the presence of different degrees of infraocclusion and the appearance of adjacent bone (the loss of periodontal space). The ankylosed tooth was compared with the corresponding molar in the opposite quadrant. Data was collected and result was analysed using chi- squared test and SPSS software.

RESULTS

A total of 40 primary molars were enrolled. According to location, ankylosed teeth were more in the lower jaw as 92.5% as compared to the upper jaw i.e 7.5%. The third quadrant has the more number of ankylosed tooth i.e 55% followed by fourth quadrant i.e 37.5%.

Table 1: Ankylosed tooth and location

Location	2nd quadrant	3rd quadrant	4th quadrant	Upper jaw	Lower jaw
Number of molars	3	22	15	3	37
Percentage %	7.5	55	37.5	7.5	92.5

Table 2: Ankylosis and each primary molar

Primary molar	64	74	75	84	85
Number of cases	3	16	10	6	5
Percentage %	7.5	40	25	15	12.5

According to the cases of ankylosis on each primary molar, the majority of the cases were of the tooth number 74 i.e 40% and of 75 is 25%.

DISCUSSION

Ankylosis of primary molars can cause severe clinical consequences in the growing child including tooth infraocclusion and vertical bone defect, tipping of adjacent teeth into the space of infraocclusion causing loss of arch space, dental asymmetry, midline deviation and impaction of the ankylosed tooth and its successor, supra-eruption of opposing teeth, and deflected path of eruption of successors, with displacement in the form of tipping and ectopic eruption of successors. [10] Extensive bony ankylosed primary molars interfere with the exfoliation and eruption of the permanent successors. [11] There is currently no therapeutic algorithm of choice but based on the existing studies most cases of dental ankylosis can be treated properly. Therapeutic approach depends on the presence of a permanent bud, diagnosis timing, and severity of infraocclusion. [12] Hence, this study was conducted to evaluate the prevalence of ankylosis in primary molars.

In the present study, a total of 40 primary molars were enrolled. According to location, ankylosed teeth were more in the lower jaw as 92.5% as compared to the upper jaw i.e 7.5%. The third quadrant has the more number of ankylosed tooth i.e 55% followed by fourth quadrant i.e 37.5%. A study by Esian D et al, showed that the highest percentage of cases with ankylosis was found in the first group (six to nine years old), respectively, with 72% of cases compared with the second group (ten to twelve years old) with 28% of cases. Of the two primary molars, the most affected by ankylosis was the first molar in quadrant three, followed by the second molar, and finally the first molar in quadrant four. Based on the data obtained, it was concluded that ankylosis is a dental condition which occurs in children in early mixed dentition, especially in the lower arch, with the first primary molar being the most affected tooth. [13]

In the present study, according to the cases of ankylosis on each primary molar, the majority of the cases were of the tooth number 74 i.e 40% and of 75 is 25%. Another study by Silvestrini Biavati A et al, showed a total of 512 consecutive subjects (aged 5 to 15 years) were examined. Thirty-four children were affected by deciduous molars ankylosis (6.6%). A statistically significant difference was revealed between the distributions: the lower deciduous molars were ankylosed more frequently than the upper ones ($P < 0.001$); the second deciduous molars were ankylosed more frequently than the first molars ($P < 0.001$). They found an incidence of deciduous molar ankylosis of about 6.6%; the lower deciduous molars and second deciduous molars were ankylosed more frequently ($P < 0.001$).[14]

As far as ankylosis is concerned, the exact causes are not yet defined, but several theories have been proposed such as familial pattern, traumatic injury to Hertwig's epithelial root sheath, deficiency in vertical alveolar bone growth, localized problems with metabolism and inflammation, localized infection, and chemical or thermal irritations, disturbance in the interaction between normal resorption and the hard tissue repair occurring in primary molars during the eruption of the successor teeth and deficient eruptive

force. [15,16] In addition, changes have been reported in the position and appearance of the cell rests of Mallassez within ankylosed primary molars. This distribution of the cell rests has been thought relevant to the subsequent likelihood of the development of ankylosis and resorption. [17]

CONCLUSION

The prevalence of dental ankylosis was higher in the third quadrant, especially in the first primary molars.

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