

RESEARCH ARTICLE

BILATERAL CONGENITALLY MISSING SECOND PREMOLARS IN A GROWING FEMALE PATIENT

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Manuscript Info

Abstract

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..... Purpose- The aim of the current hypothesis is to contemporary a rare case report of congenitally missing bilateral mandibular second premolars in an adolescent patient and describe its management. The second premolars have the utmost incidence of congenital absence, after the third molars. The delinquent resides not in the prevalence of congenitally missing premolars but in the assortment of a management plan that will yield the best outcomes over the prolong period of time. The currenteducation reports a case of a 12-year-old female growing patient with bilaterally congenitally missing second permanent mandibular premolars with supplementary crowding of teeth. The case has been managed using a multi-specialty methods, in which both deciduous mandibular second molars were sectioned and the distal half retained. The retained half was prepared to receive a full coverage restoration which was contoured as a premolar. The space created was then utilized to correct the crowding by fixed orthodontics. A two year follow up shows retained distal half of the deciduous mandibular second molar with correction of crowding and space closure.

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Introduction:-

After the third molars, the second premolars have the highest incidence of congenital absence. The problem resides not in the prevalence of congenitally missing premolars but in the selection of a treatment plan that will yield the best results over the long term. Today, two different treatment approaches to resolve this problem are available:

- 1. Extract the deciduous second molar, allow the permanent first molar to drift mesially and then complete the case orthodontically.
- 2. Retain the deciduous molar for as long as possible and then seek a prosthetic solution.

The reasons to extract the deciduous second molars when a second permanent premolar is missing are: Pulpal pathology, large restoration, carious lesions close to the pulp, normal or pathologic root resorption, crowding in the permanent teeth, ankylosis and differences in tooth sizes between deciduous and permanent teeth.¹ However, caries free deciduous second molars with long roots pose a serious dilemma.

In such cases, we might try to maintain the deciduous molars, suggesting they could last for few years, thus avoiding the complexity of closing the spaces without tooth inclination and possibly creating periodontal problems in future.

Corresponding Author:- Dr. Ahmed Hadi Al Mashni Address:- General Dentist, Najran Specialist Dental Centre, Najran, Saudi Arabia. Also, physiologic resorption of the deciduous molars without the second premolar occurs on an average of 10 years after the normal exfoliation.¹¹ Maintaining the deciduous molars could pose a Bolton tooth size discrepancy due to mesio-distal crown size difference between the deciduous second molar and the permanent second premolar, altering the occlusion if the space is not properly managed. This phenomenon becomes more important when only the maxillary or mandibular missing premolars are involved.¹⁰ The purpose of this case report is to describe the management of an adolescent patient with missing mandibular second premolars and retained mandibular second primary molars.

Case Report

A 12 year old female patient was referred to the department of pediatric dentistry with the complains of missing bilateral second permanent bicuspid from our Saudi Arabian society. The patient complained of irregular teeth. On visual examination, there was crowding in the lower anterior region with inconsistency in tooth size and jaw size for which she was suffering fixed orthodontic mechano-therapy. Correspondingly, there were retained mandibular deciduous second molars bilaterally, which were free from caries.

There were no swelling, sinus and mobility. Intraoral periapical radiographic examination revealed the absence of permanent second premolars bilaterally. The roots of the mandibular deciduous second molars did not show any sign of resorption or periapical or furcation associated rarefication. Vitality test were performed and the results were positive. The treatment plan was made to preserve the deciduous molars and to manage space by hemi-sectioning the deciduous molars. On the first appointment, local anesthesia with adrenaline was administered by inferior alveolar nerve block. Lower right deciduous second molar was isolated, access opening was made and the canals were located. The pulp was extirpated and working length of the distal canals were determined using radiographic and electronic methods. The distal canals



Figure 1:- Panoramic view of bilateral agenesis of mandibular second premolars.

were instrumented with rotary protaper files (Dentsply) with sodium hypochlorite as an irrigant. Glyde (Denstply) was used as a lubricant. The canals were prepared upto F1 and obturared using corresponding protaperguttapercha points (Dentsply). The access cavity was then restored with composite. A flap was raised to expose the furcation area. A tapered fissure bur of sufficient length was used to cut from the midpoint of the buccal aspect to the lingual midpoint through the furcation. The direction of the cut was verified radiographically using radiovisio-graph.

The cut was then extended through the pulpal floor and into the undersurface of the crown. The mesial half was then luxated and removed. On the next appointment, the same procedure was repeated for the mandibular left deciduous

second molar. On the subsequent appointments, both the teeth were prepared to receive full coverage restorations and a porcelain-fused-to-metal crown shaped as mandibular second premolars were luted.

The patient was then referred back to the department of orthodontics for correction of crowding. The patient was followed up for two years and two year follow up photograph showed both deciduous molars in place. The two year follow up radiographs [Figure 1] showed slight apical resorption of the roots of retained deciduous molars. The patient was advised to go for placement with implants after three years.

Discussion:-

Treatment of congenitally missing mandibular second premolar has been a controversial issue, since many treatment modalities have been presented with inherent advantages and disadvantages associated with each of them. A simple technique can be used in extraction therapy, namely hemisection or controlled slicing.

The method is based on slicing the second primary molar and removing the mesial half. This will allow the mesial drift of the first permanent molar. If the mechanisms are carefully designed and supported, the mandibular molar can be moved mesially with less anterior tipping and loss of anchorage.¹²If we aim for long term aesthetic results, the controlled slicing of the second primary molar is a good option for treating patients with congenitally missing second premolars as it removes obstacles which could compromise the final occlusion such as the need for prosthetic replacement.

Maintaining the space by retaining the deciduous molar, especially when an implant is planned for the future, will often compromise the occlusion due to the differences in crown height and crown length.¹ In subjects with agenesis of the second mandibular premolar teeth, the primary molar may be left in situ. ¹²Ostler and Kokich investigated the changes in ridge width over time in patients with congenitally missing second premolars. Their findings indicated a 25% decrease in ridge width within 3 years after deciduous molar extraction. Also, greater buccal ridge resorption(74%) was seen compared with resorption on the lingual side (24%). This could jeopardize the success of implant placement in the future and require bone grafting. Hemisection preserves the buccolingual ridge and prevent the formation of a lateral buccal bony depression.¹³

Those investigators concluded that retaining a healthy primary mandibular second molar is a viable treatment alternative. Uncertainty regarding when a deciduous molar will start to resorb or become ankylosed does not justify the decision to maintain it. Implant placement is not recommended until most of the alveolar growth has been completed, at an age of 20 years in females and even later in males. Late decisions on extraction or hemisection of second deciduous molars would increase the likelihood of average to poor results.^{8,13}

This result is not shared by Ostler and Kokich, who found no correlation between the age of the patient at the time of extraction and the changes in ridge width and height.[14] In earlier stages of mixed dentition, hemisection or controlled slicing, and removal of distal half of the deciduous molar followed by further removal of mesial portion, would lead to continuous space closure. On the other hand, a longitudinal follow up has demonstrated that, in cases of agenesis of premolars, the deciduous molars may be kept in the oral cavity for a long period of time.¹⁵

Bjerklin and Bennet investigated subjects with agenesis of mandibular second premolars and retained mandibular second molars from 11 years of age until the third decade of life. During the observation period, only 2 of the 59 primary teeth were exfoliated, and beyond the age of 20 years no teeth were lost.¹Sletten et al. longitudinally evaluated the retained mandibular deciduous molars in adults. Of the 28 retained deciduous molars, 24 continued to function.

Only 4 were lost at a mean age of 51 years because of caries or periodontal breakdown. Considering the results, the loss of the deciduous teeth could be regarded as negligible

In this case, guttapercha was used for obturation because of the uncertainty regarding about the time when the deciduous molars would start resorbing. Also, guttapercha was used as it was desired that the deciduous molars should be retained at least till the time of completion of the patient's alveolar growth (i.e. 5-6 years from the time of treatment).

On the other hand, the success rate of hemisection was more than 90%, which represents a significant positive response, compared with more than 75% average to poor results in extraction cases. The benefit of hemisection at an

early age lies in controlled inclination of the permanent first molar. This allows the permanent tooth to move through the labiolingual bone plate, which is maintained by the residual crown-root portion of the second deciduous molar, thus avoiding unwanted mesial rotation.

The drawback of hemisection technique is that the patient must visit the dentist twice for the hemisection and the extraction of the deciduous tooth.²Therefore, in conclusion, it can be said that retention of healthy deciduous mandibular second molars after hemisection of the deciduous molars is a viable treatment alternative, especially in cases with anterior crowding which require orthodontic space management.

Conclusion:-

Congenitally missing teeth is a dental anomaly with multifactorial etiology, occurring with greater frequency in females and in the permanent dentition. It can occur in both the maxilla and the mandible. Retaining a deciduous mandibular second molar can be a viable treatment option in cases where anterior crowding is not present. As very few studies have been done regarding the risk factors and severity of congenitally missing teeth, future studies are suggested.

Consent

The patient has provided written permission for publication of the case details.

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