

Correction of unilateral posterior cross bite in primary dentition by slow dentoalveolar expansion. - A case report.

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Abstract: The incidence of posterior crossbite in the primary dentition has been reported as 8-22%. The crossbite usually results from bilateral maxillary constriction and is commonly associated with an occlusion guided lateral deviation of the mandible upon closing. Correction of the posterior cross bite in the primary dentition is indicated to establish a stable occlusion and avoid possible deleterious effects on the developing temporomandibular joint and Treatment in the primary dentition results in the eruption of the first permanent molars in normal transverse relationship in 84% of the cases. The aim of the present case report shows the management of unilateral posterior cross bite by slow dentoalveolar expansion as the duration of the treatment was shorter than those in cases with mixed dentition and permanent dentition and also, methods of treatment were simpler, and the patients developed favourably.

Keywords: Unilat postcrossbite, primary dent, dento alveolar expansion.

I. Introduction:

Posterior crossbite is one of the most prevalent malocclusions in the primary and early mixed dentition and is reported to occur between 8% and 22%.¹⁻⁴ In most cases, the crossbite is accompanied by a mandibular shift, a so-called forced crossbite, which causes midline deviation.^{2,5} Factors involved in the etiology of the crossbite, besides heredity, are sucking habits⁶ and impaired nasal breathing caused by, for example, enlarged tonsils and adenoids.⁷⁻⁹ The status of the primary occlusion affects the development of the permanent occlusion. Thus, a posterior crossbite is believed to be transferred from primary to permanent dentition, and the posterior crossbite can have long-term effects on the growth and development of the teeth and jaws.^{10,11} The abnormal movement of the lower jaw (mandibular shift) may place a special strain on the orofacial structures, causing adverse effects on the temporomandibular joints and masticatory system. EMG; electromyographic studies have shown that the activity of the temporal and masseter muscles is disturbed in children with unilateral crossbite.^{12,13}

Background: Studies of adolescents and adults have revealed that patients with posterior crossbite have an increased risk to develop craniomandibular disorders, showing more signs and symptoms of these problems.^{4,14-16} Therefore, early treatment is often advised to normalize the occlusion and create conditions for normal occlusal development.^{1,10,17} Furthermore, postponement of treatment has been claimed to result in prolonged treatment of greater complexity.^{1,18}

II. Appliance design:

Coffin spring was designed by Walter Coffin. It is a removable/fixed, omega shaped wire appliance which produces slow and bilaterally symmetrical expansion. It consists of omega shaped wire of 1.25 mm diameter placed in mid palatal region. Free ends of omega are embedded in an acrylic plate/ soldered onto the palatal surface of molar bands. It brings about dento alveolar expansion. However, it is capable of skeletal changes when used in mixed dentition with a good retention.¹⁹

Case report: A 5 year-old girl reported to the department with the chief complaint of pain and decayed teeth on lower right and left region of the jaw. Her medical history was noncontributory, intraoral examination revealed deep occlusal caries with 75 and 85 and maxillary arch no abnormality was detected (Figures 1 and 2). On further examination we could find unilateral posterior crossbite on left side, mesial step on right side and anterior openbite (figure 3,4 and 5). On parental history mother told that she has thumb sucking habit which was continuous and vigorous and she performed that even during sleeping hours. There were no interference and deviation of the mandible on closure. This patient showed oral breathing, lip incompetence, and atypical swallowing aided by the mentonian musculature. Pulp therapy was carried out with 75 and 85 and finally restored with stainless steel crowns considering the age of the child and the time the tooth will remain in the oral

cavity. The treatment plan proposed for unilateral posterior cross bite was fixed coffin spring for the dentoalveolar expansion on the left side. Two bands were adapted onto the maxillary second primary molars and impression was made and poured with dental stone. Coffin spring was fabricated and soldered to the palatal aspect of the bands and later appliance was removed from the cast and polished, cemented on the maxillary arch using glass ionomer cement (figure 6). The girl was also trained for the tongue exercises and taught remainder therapy for the thumb sucking habit, the girl was recalled after every week for the activation of the appliance. After 4 weeks of active treatment all her maxillary primary molars were into favorable occlusion and because of constant monitoring and motivation we could see the decrease in the anterior open bite (figure 7(a), 7(b) and 8). The girl was advised to have a regular follow up. The girl was followed up for 8 months, and has as yet maintained stability of the results achieved with slow maxillary expansion (figure 8).

III. Discussion:

This case report challenges some studies^{5,18} in which this enlargement method of treatment was found to have a poor stability result. In the present case, the patient had unilateral dental posterior crossbite, and a fixed coffin spring appliance was indicated. Early correction of posterior crossbite has been recommended in order to prevent an inadequate skeletal transversal growth. As in the present case there was slow and steady dentoalveolar expansion, hence the chances of relapse was very less.

Several studies have been carried out during the last decade concerning early treatment of posterior crossbite, ie, treatment in the primary dentition or in the early mixed dentition usually before the age of nine years. However, a considerable variety in treatment approaches, study design, sample sizes, and research approach has produced disparate outcomes among these studies. Regarding intervention in the early mixed dentition, a high success rate was found and a substantial expansion effect was shown of treatment with QH, expansion plates, and RME. However, the remaining expansion, ie, expansion after retention and follow-up, was difficult to analyze and interpret because the follow-up time varied substantially among the studies.²¹

Studies have also shown that 50% of posterior crossbite cases treated at primary dentition had to be retreated at mixed dentition^{5,18}. Although these results indicated a high-incidence relapse of early treatment, other advantages have been attributed to this intervention. According to Harrison and Ashby²⁰, maxillary expansion in the primary dentition would decrease the risk of a posterior crossbite being perpetuated to a permanent dentition.

IV. Conclusion:

The early and correct diagnosis of posterior crossbite is essential to prevent the forthcoming occlusal discrepancies in the permanent dentition. Adequate curative measures and treatment modalities should be advocated to correct the posterior crossbite.

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Legends for the figures:

1. Figure 1: mandibular arch showing deep occlusal caries with primary second molars.
2. Figure 2: maxillary arch showing intact dentition.
3. Figure 3: left lateral view showing unilateral posterior crossbite.
4. Figure 4: right lateral view showing mesial step.
5. Figure 5: frontal view showing anterior openbite.
6. Figure 6: fixed coffin spring cemented onto the maxillary arch.
7. Figure 7(a): post treatment i.e after one month, left lateral view showing corrected crossbite.
Figure 7(b): post treatment i.e after one month, right lateral view.
8. Figure 8: post treatment anterior view showing decreased anterior open bite.

Figures :

