

Posterior Crossbites in Children

A posterior crossbite can be defined as a transverse discrepancy in the relationship between the maxillary arch and the mandibular arch. This issue of our newsletter reviews the prevalence and etiology of posterior crossbites and offers our treatment recommendations.

Prevalence and Etiology

Posterior crossbites are a common malocclusion of the primary and mixed dentition. Crossbites have been attributed to skeletal, muscular, or dental factors. Evidence indicates that the causative factors can be related to genetic, congenital, environmental, functional, or from oral habits (finger sucking). An insufficient maxillary arch width typically results in a unilateral posterior crossbite with an associated lateral mandibular displacement (also known as mandibular deviation or shift). A unilateral posterior crossbite usually presents with a mandibular midline discrepancy. When the maxilla is severely constricted, a bilateral posterior crossbite will present clinically (Fig 1).



Fig 1 : Examples of a Unilateral and bilateral crossbite.

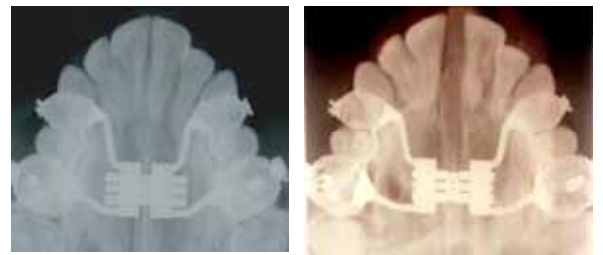


Fig 2: Occlusal views of the midpalatal suture pre and post expansion.

Sequelae of Crossbites

Mandibular displacements are present in most unilateral Posterior crossbites. Among patients with unilateral posterior crossbites, 97% present with a deflective contact, resulting in a functional shift on closure (Fig 3). This functional shift can cause unbalanced muscular activity with hyperactivity on the crossbite side. This type of Muscular hyperactivity has been shown to influence the size and shape of the developing temporomandibular joint. Crossbites have been shown to be associated with condylar deviations and in some cases signs and symptoms of temporomandibular joint disorders (TMD). Of prime importance is the fact that uncorrected crossbites can produce undesirable growth and dental compensations that may lead to asymmetric jaw growth.

97% of patients with unilateral crossbites present with a deflective contact resulting in a functional shift.

Early Treatment

Early treatment to correct posterior crossbites in the mixed dentition has been shown to have excellent success. Growth in the transverse dimension slows earlier than in the sagittal or vertical dimension and this supports the need for early treatment. Early treatment can prevent associated mandibular dysfunction and facial asymmetry caused by posterior crossbites. A crossbite can be skeletal, muscular, or dentoalveolar in origin, but regardless of the type, maxillary expansion is the usual treatment of choice.

Our philosophy of treatment favors the use of a rapid palatal expander (RPE). We have found rapid palatal expansion to be a predictable and stable treatment modality to correct posterior crossbites.



Fig 3: Patient presents with a unilateral crossbite and a functional shift.



Fig 4: A Rapid Palatal Expander

The predominant effect of an RPE in a growing child is the opening of the midpalatal suture.



Fig 5:: The opening of the mid-palatal suture. An obvious space (diastema) is present between the maxillary central incisors



Fig 6 : Incisors converge later as a result of tension in the transeptal fibers.

Rapid Palatal Expansion (RPE)

Rapid palatal expansion is most effective with a fixed appliance with a jackscrew device which is usually turned one time a day (Fig 4). This therapy promotes positive structural and dental changes. The predominant effect in a growing child is the opening of the mid-palatal suture (Fig 2). This can also be visualized by a space (diastema) appearing between the maxillary central incisors (Fig 5). The central incisors later converge as a result of the tension in the transeptal fibers during retention (Fig 6). The rapid palatal expansion device can also provide additional space in the arch to relieve crowding and possibly avoid impaction of the maxillary cuspids.

Conclusion

Posterior crossbites are the most common malocclusion in young children, they can be caused by a variety of skeletal, muscular or dental factors. This condition produces insufficient maxillary arch width and is frequently associated with various oral sucking and postural habits. Posterior crossbites rarely self correct, if left untreated this problem can result in adverse skeletal growth changes. Once growth is complete a posterior crossbite can only be corrected through a combined orthodontic-surgical approach. Timely treatment of such problems, during the mixed dentition is recommended. This treatment can establish optimal functional skeletal, and neuromuscular growth during the time of active change. Various mechanical treatment modalities designed to expand the posterior maxillary arch width are available to correct this problem. Our practice has favored the use of a rapid palatal expander (RPE). Palatal expansion allows for optimal maxillary and mandibular development and growth.

The forces involved act through tooth tipping, bodily tooth movement, orthopedic movement, or a combination of these. When selecting an expansion method, the patients age, skeletal and muscular pattern, degree of maxillary constriction, and habits should all be considered.

*****Please note : all cases shown in this newsletter were treated by The Brace Place Doctors*****

References

1. Proffit et al , Posterior crossbites
2. Epstein M., et al, Diagnosis and Treatment of Posterior Crossbites

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1. T, 2. F, 3. T, 4. T, 5. F,

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Our next issue will be on Oral Habits: Non-Nutritive Sucking and Tongue Thrusting

1. T F The predominant effect of a rapid palatal expander in a growing child is the opening of the mid-palatal suture.
2. T F A posterior crossbite is an anterior posterior discrepancy in the relationship between the maxillary and mandibular arches.
3. T F Most patients with a unilateral crossbite also present with a deflective contact resulting in a functional shift.
4. T F Once growth is complete a posterior crossbite can only be corrected through a combined orthodontic-surgical approach.
5. T F Once expansion is complete, the space created between the maxillary central incisors closes due to tension in the transeptal fibers.