# UNILATERAL POSTERIOR CROSSBITE IN PRIMARY DENTITION. CASE REPORT

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## ABSTRACT

**Aim of the study** Preventive orthodontic care necessitates rational treatment planning among children even in an early stage of dental and skeletal development. **Material and methods** The oral rehabilitation of patients with unilateral posterior crossbite in primary dentition remains a challenge, for the clinician and for the patient, due to functional, aesthetic and self-maintenance alterations, and requires early orthodontic treatment. To illustrate the treatment difficulties of such a pathology, we present a clinical case, a five years old girl diagnosed with unilateral posterior cross- bite, narrow maxilla and left mandibular shift. **Results** In order to fulfil the therapeutic objectives, a rapid palatal expander with a median screw welding on band cemented on 5.5, 6.5 was applied. After 3 month the transversal unilateral discrepancy was corrected**,** with stable occlusal contacts. **Conclusions** For skeletal transverse problems the appliance of choice is a rapid maxillary expander especially for growing patients.

**Key words:** cross-bite, preventive orthodontics

## INTRODUCTION

Malocclusion reaches its highest prevalence worldwide in early childhood during the deciduous dentition period (54%) and keeps unvaried in permanent dentition (54%). According to literature, malocclusion represents a relevant oral health problem as well as an economic burden for either family of affected children and dental health public services. [1]

Preventive orthodontic care necessitates rational planning of orthodontic preventive measures among children even in an early stage of dental development.[2]

Posterior crossbite is one of the most prevalent malocclusions in the deciduous dentition. Without early treatment, it can result in facial asymmetry and temporomandibular disorders in adulthood, elements associated with complex and difficult rehabilitation. [3]

Furthermore, the muscular hyperactivity on the crossbite side might have an unfavourable influence on craniofacial growth that can lead to craniofacial asymmetry, temporomandibular joint (TMJ) dysfunction and deviation from normal facial aesthetics. [ 4-6]

Moss functional matrix theory of growth and development presumes that growth of the

face occurs as a response to functional needs and is mediated by the soft tissues in which the jaws are embedded. In addition to heredity, other factors involved in the aetiology of posterior crossbite are non-nutritive sucking habits and impaired nasal breathing caused by, for example, enlarged tonsils and adenoids. [7,8]

In children with posterior crossbite and those who breathe through their mouth, excessive vertical height is associated with deficient transverse dimension; nevertheless, the true relationship between mouth breathing and posterior crossbite is still in question. Lip incompetence plays an important role in the growth and development of the craniofacial complex although the open-mouth posture does not reflect the mode of breathing. [9,10]

Preventive and early orthodontic treatment are still the subject of continuous debate and controversy regarding cost-effectiveness, functional and psychosocial benefits. Early treatment of posterior crossbite is advised to enhance skeletal and dental development and correct habits and malocclusions in their early stages, especially the transverse discrepancies that can cause facial asymmetry. [2, 9]

All transverse alterations should be treated as soon as possible (ideally during temporary o mixed dentition); early treatment is essential for a stable result.

Dentoalveolar transverse problems are corrected with a Hawley appliance with an expansion screw or with a Quad-Helix.

For skeletal transverse problems the appliance of choice is a rapid maxillary expander.

It is very important to correct crossbites at an early age, during the first stage of mixed dentition, when rapid maxillary expanders can be used to open the mid-palatal suture and correct transverse skeletal problems. This suture can be opened when palatal expansion is performed in patients who are still growing.

If the transverse alteration is accompanied by a vertical or anterior-posterior malocclusion, the transverse alteration must be treated first.

After correcting the transverse malocclusion at an early age, the results must be stabilised with retainers until all the permanent teeth have replaced the deciduous teeth.[11]

## MATERIAL AND METHODS

5 years old girl, presented for physiognomic impairment during speaking and smiling. We obtained the patient's informed consent from the parents (parents expressed theirs written consent for the minor to participate in this study and for the research results to be published in specialized scientific journals).

During the exo-oral examination we notice oval face form, left mandibular shift and straight profile. During palpation of bone contours, muscle insertions and lymph nodes, no changes were observed (fig.1).

**Figure 1. Patient face and profile at the beginning of the treatment**

The endo-oral examination reveals: satisfactory oral hygiene, deciduous dentition, consistent with age, left side midline deviation, unilateral left cross-bite (fig.2, 3).

**Figure 2. Static occlusion at the beginning of the treatment - frontal view**

**Figure 3. a. b.**

**Static occlusion at the beginning of the treatment: a. lateral view left side; b. lateral view right side**

Functional examination reveal: mixed breathing, atypical swallowing, unilateral mastication, unaffected phonation, impaired physiognomy when smiling, impaired self-maintenance.

The subsequent diagnosis can be formulated:

- unilateral cross- bite, on the left side, 6.2-6.4, associated with narrow maxilla and left mandibular shift

-affected functions (aesthetics, mastication, self-maintenance), specific prophylactic measures (sealants).

The aetiology of the malocclusion included: delayed eruption with order discrepancies, eruption of 7.3 at the age of one year and 3 months, non-nutritive sucking habits on the left side and lack of abrasion on the temporary canines' cusps.

Treatment objectives comprises: maxillary expansion in transverse direction to correct the discrepancy on the left hemiarch; intermaxillary harmonization of occlusal relationships and creation of the conditions for balanced development of the dento-maxillary apparatus; functional and stable static and dynamic occlusal relations.

## DISCUSSIONS AND EVOLUTION OF THE CASE

In order to fulfil the therapeutic objectives, a palatal expander with a median screw welding on band cemented on 5.5 and 6.5 was applied. (fig.4).

**Figure 4. Palatal expander with median screw and bands cemented on 5.5 and 6.5**

After the rapid palatal expander was applied, it was activatted once every two days with 90º turns. After 3 month the transversal unilateral discrepancy was corrected, the screw was blocked and the expander was maintained for another 3 months to preserve the obtained results. The patient will be followed-up periodically, every 3-6 months, until the end of the mixed dentition, to ensure accurate position for the permanent teeth. The patient benefits of a natural contention, due to stable occlusal contacts established at the end of the early orthodontic treatment (fig. 5, 6).

**Figure 5. a. b.**

**Static occlusion after treatment - a. lateral view right side; b. lateral view left**

**side-corrected cross-bite**

**Figure 6. Static occlusion after treatment, stable occlusal contacts-frontal view**

Results suggest that the abnormal masticatory cycle associated with functional posterior unilateral cross-bite tends to normalise following early cross-bite treatment. Masticatory muscle activity shows an increase after early functional unilateral posterior cross-bite treatment, and this activity approaches normal levels and permits us to assume that interceptive orthodontics ensure correct development, element in line with literature data. [12]

The upper arch expansion is more likely to be stable if teeth to be moved are initially tilted palatally.

Family support and patient compliance are key factor in early orthodontic treatment success, especially with fixed appliances, since oral hygiene must be accurate to reduce caries risk and preserve periodontal structure equilibrium. Our presentation highlights the importance of early diagnosis and optimal interceptive treatment since malocclusion signs often appear in temporary dentition.[13]

## CONCLUSIONS

1. For skeletal transverse problems the appliance of choice is a rapid maxillary expander.
2. If the transverse alteration is accompanied by a vertical or anterior-posterior malocclusion, the transverse alteration must be treated first.
3.After correcting the transverse malocclusion at an early age, the results must be stabilised with retainers until all the permanent teeth have replaced the deciduous teeth.

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