Australian Society of Orthodontists

University of Sydney

# Early Orthodontic Treatment

## PART 1

*Creating Brighter Futures*

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## Introduction

Early orthodontic treatment during the mixed dentition remains a controversial topic. There have always been orthodontists who have evangelised that all malocclusions are best treated early while others, at the opposite end of the spectrum, have refuted the benefits of early treatment in the majority of cases. As is so often the case, a balanced view based on individual assessment will best serve the patients we treat. This two-part issue of Brighter Futures will discuss a number of malocclusions or conditions which the majority of orthodontists agree should be considered for early treatment to minimise damage to teeth or unfavourable growth.

However it should be stressed that not all children with the malocclusions discussed should be treated early. There are many factors which must be taken into consideration when deciding whether or not to embark on early orthodontic treatment. These may include stage and direction of growth, agenesis of teeth, pathology, general health, health of the teeth, oral hygiene, patient and family attitude towards treatment, likely co-operation, cost or cost effectiveness of the treatment and logistical concerns.

So which orthodontic problems are usually better treated early rather than waiting until the early permanent dentition?

## Anterior Crossbites

The indications for early correction of anterior crossbites include functional mandibular deviation on closure, premature attrition, gingival recession and tooth mobility.[1] Incisors in crossbite can be fractured more easily in an accident and space can be lost in the arch when a tooth is displaced out of arch alignment.

*Fig 1 Anterior crossbites resulting in wear facets, gingival recession and space loss (respectively).*

When deciding on early treatment to correct an anterior crossbite it is very important to distinguish between patients with a Class I malocclusion and those with a distinct or developing Class III malocclusion as treatment and ongoing management can be quite different. Although there are a number of different appliances that can be used to correct a simple anterior crossbite, the two most common are a removable plate with finger springs or a screw mechanism, and partial fixed appliance treatment.

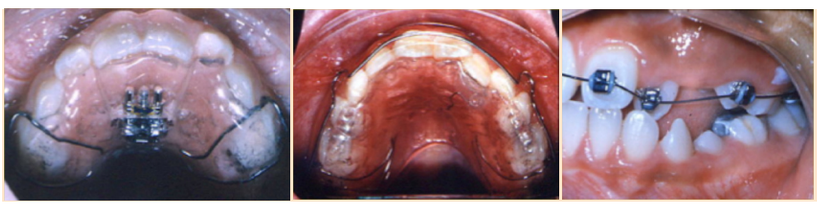

*Fig 2 Plates with a screw and a spring, and partial fixed appliances used to correct an anterior crossbite.*



## Indigenous Oral Health Workshop

In September this year 90 representatives from all states and territories in Australia attended an Indigenous Oral Health Workshop organised by the Australian Research Centre for Population Oral Health (ARCPOH) in Adelaide.

The workshop was supported by Colgate and the assembled group discussed culturally appropriate oral health policies and labour force, access to services and service provision, prevention, treatment, research and advocacy. The outcomes of this workshop are currently being written up by the Indigenous Oral Health Unit at ARCPOH and will be published in due course. Indigenous populations carry a heavy burden of oral disease and we should all, as dental practitioners, be proactive in working toward a solution for this inequity.

It was a privilege to be able to support and attend this workshop and to meet with those who work tirelessly in this area to improve oral and general health outcomes in these populations. They deserve our acknowledgement and encouragement. Hopefully, the outcomes of the workshop will go some way towards achieving better health for all indigenous people.

Dr Susan Cartwright



*You may wish to share this issue of **Brighter Futures** with your hygienists and other staff members.*

## Posterior Crossbites

Posterior crossbites usually arise as a result of a relative constriction of the upper arch. Early treatment can be indicated to prevent mandibular deviation on closure, asymmetric mandibular growth, asymmetric alveolar development, space loss, wear faceting and a number of other less common consequences. In particular, untreated unilateral posterior crossbite in children can lead to adaptive asymmetric condylar growth and associated asymmetries.[2] Most posterior crossbites are easier to treat early, and simple early treatment can avoid more complicated, sometimes surgical correction if growth is complete. Once again it is very important to differentiate between Class III growing patients and those with a Class I skeletal pattern as the immediate and future treatment requirements can vary significantly.

Most crossbites in the mixed dentition are due to bilateral, generally symmetrical constriction of the maxillary dental arch and on closure the mandible slides to one side to achieve maximum intercuspation of the posterior teeth. This slide produces a midline discrepancy and manifests as a unilateral crossbite. However it is not a unilateral maxillary constriction and should be corrected with bilateral expansion. It is important to differentiate true unilateral crossbites, which are much less common, as treatment can be quite different and misdiagnosis can lead to inappropriate treatment. It is also important to identify skeletal crossbites produced by asymmetrical jaw growth and dental crossbites resulting from ectopic eruption of posterior teeth as, again, treatment and ongoing management can be entirely different.

*Fig 3 A bilateral upper arch constriction producing a mandibular slide to the right side on closure with the resultant midline discrepancy and a crossbite of the right posterior teeth. Symmetrical upper arch expansion is required to allow the mandible to close without shifting to the right side.*

Early treatment for a simple maxillary constriction with a posterior crossbite often involves the use of a fixed expansion appliance such as a Rapid Maxillary Expansion appliance (RME) or a quadhelix. Expansion can also be achieved with a removable screw expansion plate, although more patient co-operation is required and expansion can be more dento-alveolar than orthopaedic, depending on age. Most expansion, including the retention period, is completed over approximately a 6 to 9 month period.

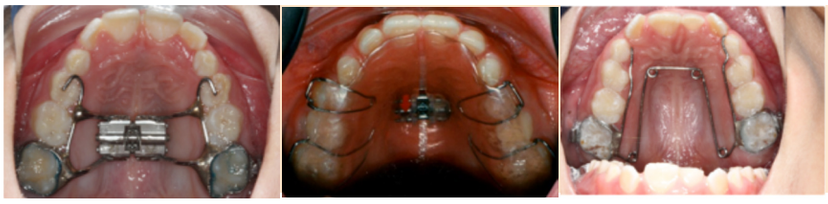

*Fig 4 Early expansion with an RME, removable plate and quadhelix.*

Correction of a true unilateral posterior crossbite or a dental crossbite rather than the more common bilateral crossbite can involve similar appliances which are modified for asymmetric expansion or restricted to specific dental movement as illustrated in Figure 5.

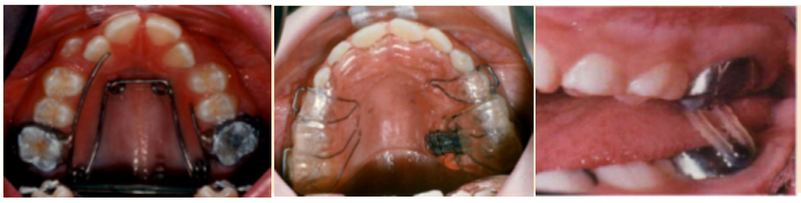

*Fig 5 Modified quad helix, removable plate and cross-elastic used for correction of unilateral and dental crossbites.*

Airway assessment and management is an essential etiological consideration when treatment planning correction of posterior crossbite. In particular, compromised nasal passage respiration is a common etiological factor usually resulting in bilateral maxillary constriction. Resolution of underlying respiratory pathology is important for stability of orthodontic correction.

## Upper Incisor Protrusion

Early retraction of permanent upper incisors can improve esthetics which would otherwise compromise self-esteem, and significantly improve function, particularly speech and mastication. Excessive overjet is also a significant risk factor for maxillary incisor trauma.[3] For children with a Class I or very mild Class II malocclusion, simple retraction of the incisors can involve either partial upper fixed appliances or a simple upper removable plate. A more significant skeletal Class II malocclusion could indicate combination orthopaedic/orthodontic correction using a functional appliance.

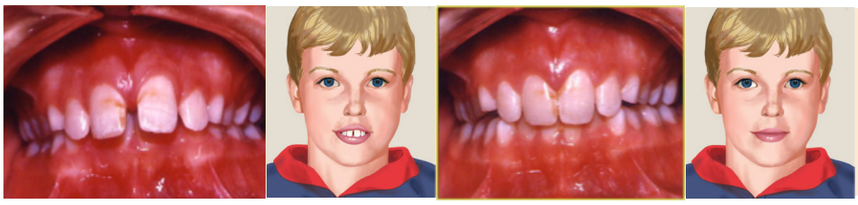

*Fig 6 Before and after retraction of upper incisors.*

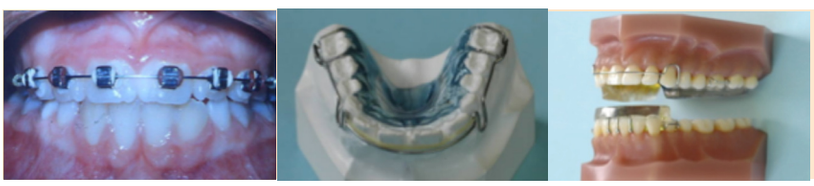

*Fig 7 Partial upper fixed appliances and removable plate to retract upper incisors. Twin Block functional appliance to retract upper incisors and correct skeletal Class II.*

BRIGHTER FUTURES

**Brighter Futures** is published by the Australian Society of Orthodontists (NSW Branch) Inc. in conjunction with the Orthodontic Discipline at the University of Sydney.

The newsletter is intended to help keep the dental profession updated about contemporary orthodontics, and also to help foster co-operation within the dental team.

Without the generous support of Henry Schein Halas and Colgate, who are an integral part of the dental team, this publication would not be possible.



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**MISPRINT**
The name of the principle author was incorrectly printed in the previous Brighter Futures Newsletter.

**The principal author of Third Molar Removal was Dr Ping Ping Yeoh.**

We apologise for any confusion created by this error.

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## Oral Habits

**Thumb and finger sucking habits** are common in children, although intervention is not always necessary, particularly if there are no deleterious effects. Habits of sufficient frequency, duration, and intensity can be associated with dento-alveolar or skeletal deformations such as excessive overjet, anterior open bite and posterior crossbite. Frequency and duration of the habit is more significant than the force generated.[4, 5]

Habit treatment usually commences with patient/parent counselling and the use of simple behaviour modification techniques such as thumb bandages or glove at night. If unsuccessful, reminder appliances such as a habit crib or bonded brackets on the lingual surface of upper incisors can be used. However they are indicated only when the child wants to stop the habit and would benefit from a fixed reminder.

Following cessation of the habit, some of the dento-alveolar deformities can correct spontaneously. However active orthodontic treatment could be indicated if significant overjet, openbite or posterior crossbite persist several months after the habit has ceased.


*Fig 8 a) Posterior crossbite, anterior open bite and overjet caused by thumbsucking. Note fractured incisor probably predisposed by its protrusion. b) Significant spontaneous correction after cessation of the habit. c) Example of a habit crib.*

**Tongue thrusting**, involving an abnormal resting tongue posture and abnormal swallowing pattern, may be associated with anterior open bite, upper incisor protrusion and abnormal speech.[6] The causes of a forward resting tongue posture can be of muscular and neurological origin, syndromic, macroglossia, or related to enlarged tonsils and adenoids and breathing difficulties. Thus management of this problem can often be multidisciplinary.

There is little evidence that intermittent short-duration pressures, created when the tongue and lips contact the teeth during swallowing or chewing, have significant impact on tooth position.[4] Thus, if resting tongue posture is normal, a tongue thrust swallow has minimal clinical significance. In such a situation the tongue thrust swallow is a compensation for the open bite or excessive overjet rather than a primary etiological factor. If forward tongue posture and function are a compensation maintaining an open bite produced, for example, by a previous thumbsucking habit, then orthodontic reduction of the open bite and overjet may be all that is required to normalise tongue function. Occasionally a tongue crib can be used to retrain the forward resting tongue posture and function to allow for spontaneous or assisted anterior bite correction.

*Fig 9 Upper and mild lower incisor protrusion produced by a combination of thumbsucking and forward tongue posture. A crib was designed to stop the thumbsucking and retrain the forward tongue posture. Open bite and overjet correction were spontaneous without the use of active orthodontic treatment.*

Further aspects of early orthodontic treatment will be presented in Part 2 of this newsletter.

## References available upon request