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Aetiology, diagnosis and treatment of posterior cross-bites in the primary dentition

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Summary. *Introduction.* Children who present with a posterior cross-bite in the primary dentition may be predisposed to long-term detrimental consequences if the condition is left untreated. Controversy exists in the literature as to the most appropriate time to treat this condition.
Objectives. The aim of this review is to evaluate the need for correcting posterior cross-bites in the primary dentition based on the current understanding of the aetiology, likelihood of self-correction, and consequences of various forms of this malocclusion persisting into the mixed and permanent dentitions. A review of the reported treatment options for management of this condition is also presented.
Methods. Literature pertaining to the epidemiology and management of posterior cross-bites in the primary dentition are reviewed.
Conclusion. Posterior cross-bites in the primary dentition are relatively common and their causes are numerous. Because a significant proportion of posterior cross-bites self-correct beyond the primary dentition, routine correction in the primary dentition phase cannot be advocated. A unilateral posterior cross-bite as a result of a functional displacement of the mandible is one of the few malocclusions which should be considered for correction in the primary dentition. Further research is needed in the management of this condition.

Introduction

Recognizing conditions which predispose young children to malocclusions is an important part of any comprehensive paediatric dental assessment. Detection of these conditions in the primary dentition can allow either intervention or monitoring on an effective basis [1]. Deciding when or even whether to treat an orthodontic problem in the primary dentition is a controversial issue [2,3]. A condition that typifies this controversy is the treatment of a posterior cross-bite in the primary dentition (Fig. 1).

Fig. 1. Example of a posterior cross-bite in the primary dentition.

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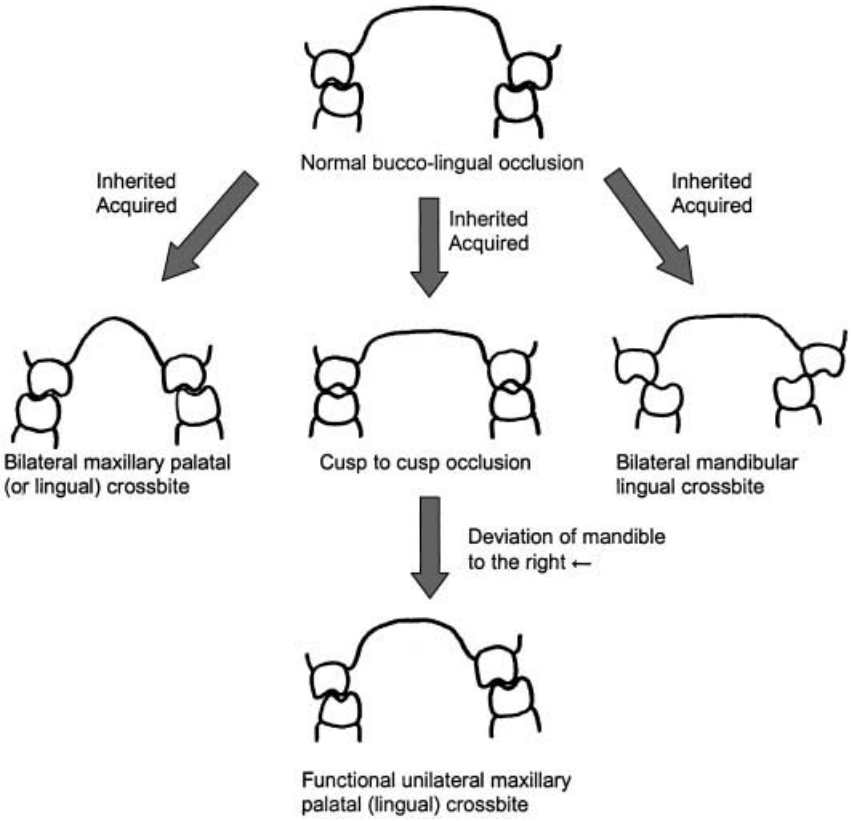

Fig. 2. Flow diagram showing common clinical manifestations of posterior cross-bite in the primary dentition and the way in which they arise. The terminology used in the literature to describe the various clinical manifestations can vary considerably and cause confusion. The classification shown below is adapted from Proffit [5].

Posterior cross-bite has been defined as a transverse discrepancy in arch relationship in which the palatal cusps of one or more of the upper posterior teeth do not occlude in the central fossae of the opposing lower teeth [4]. Clinical manifestations of posterior cross-bite are shown in Fig. 2. A posterior cross-bite may be unilateral or bilateral when a patient bites into maximal intercuspation, and the cross-bite is usually described in terms of which teeth (maxillary or mandibular) are displaced from their normal position [5]. The majority of posterior cross-bites in the primary dentition appear to be unilateral rather than bilateral [6–10].

The reported prevalence of posterior cross-bite in the primary dentition varies from 1% to 16%, depending upon the population sampled, with Caucasian populations generally exhibiting a higher prevalence than African and Asian populations [6–8,11–15]. It is thought that this difference between racial groups may be, in part, caused by cultural variation in the prevalence of sucking habits among these populations [8,16]. The proportion of posterior cross-bites of the primary dentition which persist into the permanent dentition varies, with longitudinal studies reporting between 55% and 92% of these malocclusions failing to self-correct beyond the primary dentition stage [9,13,17,18].

Treatment of posterior cross-bites in the primary dentition has been advocated for better long-term stability, reduction in overall treatment complexity and time, and better functional and/or aesthetic end results [1,19]. Conversely, orthodontic treatment is often postponed until the mixed or permanent dentition stages in order to allow time for possible spontaneous correction of the malocclusion, to avoid multiple treatment phases (as a result of relapse or other orthodontic problems which do not manifest until later), and to ensure the patient has reached a developmental stage at which cooperation towards and self-motivation for treatment is more likely [2,20].

The purpose of this review is to determine whether there are any indications for treating posterior cross-bites in the primary dentition by describing the causes and the consequences of a cross-bite persisting into the mixed and permanent dentitions. Finally, the indications and contraindications of the various treatment modalities which can be used for posterior

cross-bite correction in the primary dentition are discussed.

Aetiology and diagnosis

A transverse discrepancy in arch relationship resulting in a posterior cross-bite may be skeletal or dental in origin, or often a combination of both. Transverse problems in the primary dentition can also lead to occlusal interferences, particularly in the canine region, which may then lead to a functional shift of the mandible anteriorly or laterally [1]. A summary of the possible causes of posterior cross-bite in the primary dentition is seen in Table 1.

Aetiology

Posterior cross-bites in the primary dentition commonly arise as a result of a narrow maxilla that may be a result of genetic or environmental influences, or usually, a combination of both. The diagnosis of posterior cross-bite is often complicated by skeletal and dental discrepancies in the sagittal and vertical dimensions. Patients with a severe antero-posterior skeletal discrepancy class II can present with a complete buccal cross-bite, and patients with class III malocclusion can have bilateral posterior cross-bite with normal maxillary and mandibular arch widths [1]. Growth in the transverse direction can be impeded by interference with the mid-palatal suture at an early age, such as that seen in patients with a cleft palate who have undergone surgical repair of the cleft. These patients are predisposed to developing posterior cross-bites because early repair of the cleft (before 2 years of age), in order to facilitate the acquisition of normal speech, results in scarring and inhibition of mid-facial growth [21]. Posterior cross-bites in these patients are most commonly treated in the mixed or permanent dentition, when a number of other orthodontic and surgical interventions may be required.

Soft-tissue influence and habits. Jaw growth and tooth alignment can be altered by many soft-tissue factors and habits. During this rapid growth period for the child, tongue position and size, mouth breathing, non-nutritive sucking (such as digit or pacifier sucking), and jaw-posture habits can all contribute to the development of a posterior cross-bite [4]. In managing the posterior cross-bite, these influences should be considered and habit correction strategies implemented, if possible before embarking on orthodontic treatment.

Several studies have shown that significant maxillary constriction is associated with sucking habits which continue longer than 24 months of age [16, 22–26]. The effect the sucking habit will have on narrowing the maxillary arch will depend on the intensity (number of hours per day) of the habit as well as the duration in years [16,24]. Non-nutritive sucking is also associated with anterior open bite, increased over-jet and class II malocclusion [14,23,27]. In a prospective study of 372 children from Iowa, USA, who had their sucking habit monitored from birth until 4–5 years of age, the greatest changes in dental arch and occlusal characteristics were seen when a sucking habit continued beyond 48 months [23]. In 71% of children with a habit that persisted up to or beyond 48 months, there was evidence of anterior open bite, posterior cross-bite or increased

Table 1. Possible causes of posterior cross-bite in the primary dentition.

Type	Cause
Developmental	Transverse discrepancy between the maxilla and mandible Anteroposterior skeletal discrepancy Cleft palate, and other malformations of the head and neck
Pathology	Unilateral condylar hypoplasia or hyperplasia Juvenile rheumatoid arthritis
Soft-tissue influence and habits	Neonatal intubation resulting in trauma to or prolonged pressure on the palate [44] Early weaning and associated low-impact muscular activity from bottle feeding [14] Non-nutritive sucking Functional shift to achieve maximal intercuspation Adaptive swallowing behaviour Open mouth posture/predominant mouth breathing Low tongue position Conditions associated with decreased tonic muscle activity Scarring as a result of post-traumatic injury (e.g. burns)

over-jet, whereas less than 35% of children displayed any of these malocclusions if the habit ceased before 48 months of age. Posterior cross-bites accounted for 29% of the malocclusions observed in the children with a sucking habit that persisted beyond 4 years of age. More recent findings from this same cohort revealed that pacifier use beyond the age of 24 months was associated with a significantly greater prevalence of posterior cross-bite, mainly as a result of an increase in mandibular arch width, with maxillary growth remaining relatively stable [22].

A prospective study of 148, 3-year-old Finnish children considered the effect of early weaning and non-nutritive sucking on occlusion [14]. This study reported that posterior cross-bite was associated with early weaning, and it was suggested that this was caused by interference with normal development of the alveolar ridges and the hard palate as a result of the comparatively lower-impact muscular activity associated with bottle feeding.

Jaw-posture habits such as routinely posturing the mouth open can also inhibit transverse maxillary growth. This is because the tongue is not positioned within the maxillary arch to counter the effect of the inward cheek pressure. Breathing obstruction, often as a result of adeno-tonsillar enlargement, is associated with mouth breathing and altered head posture, and also leads to a significant increase in the prevalence of posterior cross-bite [28–30]. Another group of patients at risk of developing a posterior cross-bite as a result of an open mouth posture are those with various forms of cerebral palsy and conditions associated with muscle hypotonia.

Diagnosis

In addition to a thorough history and examination of the child in the dental chair, observing study models for adequacy of width or depth of the palatal vault, or abnormal axial inclination of the molar teeth will help to distinguish those cross-bites which are primarily skeletal from those which are primarily dental in origin [5]. The nature of the skeletal discrepancy may be further assessed by analysing a postero-anterior cephalometric radiograph [1]. It is important to note that there are few cross-bites of dental origin observed in the primary dentition because most dental cross-bites are a result of crowding [4] and significant crowding in the primary dentition is rare [20].

Functional posterior cross-bites. A functional posterior cross-bite in the primary dentition results from the mandible shifting into an abnormal position due to the presence of tooth interferences. This position is often more comfortable for the child [31]. A functional posterior cross-bite is typically a result of a mild bilateral constriction of the upper arch, which forces the mandible to displace laterally (or anteriorly) to a position that is more comfortable [1,4]. This displacement prevents the posterior teeth occluding in a cusp-to-cusp relationship, as would occur in centric relation (retruded jaw position) [32]. Methods of determining whether a patient is undergoing mandibular displacement on closure have been described by several authors [4,20,31,33].

Benefits of early intervention versus consequences of non-self-correcting posterior cross-bites

The implications of long-standing skeletal malocclusions are commonly debated among investigators and practitioners [34]. As previously indicated, there is evidence that the majority of posterior cross-bite malocclusions do not correct themselves. The long-term consequences of not treating a posterior cross-bite early, therefore, need to be understood in order to justify correction during the primary dentition stage. Orthodontic treatment of posterior cross-bites during this period is considered desirable when it may have a positive effect on the factors described below.

Chewing function and the temporo-mandibular joint

Occlusal interferences are more prevalent in children with a posterior cross-bite. Because bruxism can be triggered by occlusal interferences [35], children with posterior cross-bite may be at increased risk of bruxing, which could lead to significant tooth surface loss. A recent study by Thilander *et al*. [36] showed that this may occur in the primary dentition. The effect that these occlusal interferences have on the temporo-mandibular joint (TMJ) are unclear. Most investigators agree that occlusal factors play only a minor contributory role in the aetiology of TMJ pain and dysfunction, while factors such as stress-related grinding or clenching habits play a much greater role [37,38]. Although the extent to which malocclusions in the primary dentition can lead to long-term temporo-mandibular disorders is

still greatly disputed, posterior cross-bites with a shift on closure are one of the malocclusions which correlate consistently with TMJ problems [32,36,39–43]. This is thought to be a result of the asymmetric condylar positioning and contralateral dental arch asymmetry (cross-bite side towards class II sagittal relationship and non-cross-bite side towards class I relationship) that is associated with such a functional shift [1]. Therefore, the early correction of functional unilateral posterior cross-bites, associated with a functional shift, may be indicated based on assessment of the degree of disruption to normal TMJ function.

Aesthetics

Certain skeletal malocclusions are routinely judged as non-aesthetic by patients or their carers, and may lead to varying amounts of distress, depending on the individual's values and self-confidence [34]. In the case of unilateral posterior cross-bites in the primary dentition, a facial asymmetry, as a result of a lateral mandibular displacement, results in lower midline discrepancy and deviation of the chin towards the cross-bite side [1]. This may be seen as a significant deviation from normal facial aesthetics, particularly by the parent or caregiver, and may be an indication for treatment in the primary dentition. Although a young child with an uncorrected posterior cross-bite may have a facial asymmetry only as a result of a functional shift, a long-term consequence of this functional shift could be a displaced resting posture, which can lead to the production of an undesirable growth modification [4]. The result of this would be a facial asymmetry of skeletal origin. Bilateral cross-bites, in contrast, are not associated with any such facial asymmetry.

Speech and deglutition

Patients are commonly referred by speech pathologists to paediatric dentists for assessment of severe posterior cross-bites as a possible aetiological agent for poor speech. There is some evidence to suggest that posterior cross-bites in the primary dentition may be linked to speech abnormalities, such as poor speech intelligibility and greater speech nasality [44], as well as defective articulation of sounds such as 'r', 's' and 'l' [45]. One Spanish study did find an association between unilateral posterior cross-bites and abnormal swallowing patterns in 10- to 15-year-old children [46], but it appears that no studies have analysed the effect of posterior cross-bites on deglutition in the primary dentition. However, good oral motor function is essential for sucking, swallowing and feeding, and is the basis for speech sound development.

Space considerations

Expanding a narrow maxilla increases both arch width and circumference [47]. If this is carried out early, before extensive root formation of the permanent teeth, this may help to promote normal eruption, and therefore, prevent the cross-bite from persisting into the mixed and permanent dentitions [48]. In some patients, therefore, it may be possible to reduce the risk of future crowding by correcting a posterior cross-bite early, but randomized, controlled clinical trials are required to confirm or refute this.

From this review of the consequences of not correcting a posterior cross-bite early, it appears that the only clear indication for correction in the primary dentition is in cases where aesthetics or function may otherwise be compromised. For example, the correction of a functional posterior cross-bite during the primary dentition stage may reduce the risk of undesirable growth modification more effectively than if correction was carried out at a later stage. Further research is required, however. In addition, each case needs to be assessed individually since many of the treatment modalities described below depend on an intact dentition and a certain level of patient cooperation.

Treatment modalities

Overall, there are three basic approaches to managing posterior cross-bites in the primary dentition:

1 Correct any habit that has contributed to the aetiology of the cross-bite or monitor for spontaneous correction.

2 Remove tooth interferences or generate cuspal guidance that prevents the patient from biting into functional cross-bite. This approach may be considered when there is a unilateral cross-bite associated with a canine-guided functional shift.

3 Actively expand a constricted maxillary arch using one of several removable or fixed appliances. For dental and most forms of skeletal posterior cross-bites with an intermolar arch width differential of greater than one millimetre, these cannot be

predictably corrected by removal of tooth interferences alone, and so arch expansion is required. Some of the expansion appliances may serve an additional function by helping to eliminate certain contributory habits such as digit sucking.

As indicated in Table 2, there are a wide variety of treatment modalities which have been used to correct posterior cross-bites in the primary dentition. Some of these correction strategies appeal to clinicians because of their simplicity or their efficiency in achieving a desired effect. As with any clinical intervention, there are limitations to what can be achieved with each particular treatment modality. One of the most important considerations is the need for patient cooperation for many of these procedures. By the age of 5 years, many patients will have developed a certain level of initiative that would enable them to cooperate with a number of these correction strategies, but there will be considerable individual variation [49]. Patients with certain forms of cerebral palsy and conditions associated with muscle hypotonia may be unable to cooperate with normal habit-correction strategies because of physical and/or learning disabilities, but may respond well to other combined therapies [50–52]. Finally, the wearing of an appliance relies on the presence of sound abutment teeth and a dentition that is not about to be modified by the emergence of permanent teeth.

Orthodontic appliances used to correct posterior cross-bites in the primary dentition may result in side-effects which may be of some benefit to the patient. The orthodontic forces which are only considered light enough to tip teeth in later stages of development may also result in some skeletal change during the primary dentition phase because there is less interdigitation of the mid-palatal suture [1]. The orthodontic appliance may also act as a habit modification (or elimination) device since it acts to remind the child when the offending digit has been placed in the mouth. There are reports that rapid maxillary expansion appliances (RMEs) may also be an aid in alleviating nasal airway constriction that may have contributed to constricting the maxilla in the first place [53–56]. However, the effect of rapid expansion can vary from no appreciable change to marked improvement in nasal airflow depending on the cause, location and severity of the nasal obstruction [55].

One factor that may impact on whether to treat the cross-bite in the primary dentition is the expected timing of eruption of the first permanent molars. If the first permanent molars have not erupted, but radiographs reveal that they are no longer covered by bone, appliance therapy should be delayed until the mixed dentition phase to avoid the molars erupting into cross-bite after the primary teeth have already been moved [31,57]. The early loss of primary molars as a result of caries may also necessitate delaying treatment, probably until the late mixed or early permanent dentition stage [31].

If correction of the posterior cross-bite is indicated at the primary dentition stage and the dentition is intact, there are advantages and disadvantages in using either removable or fixed appliances. Removable appliances are advantageous because they require very little operative time, but fixed appliances such as quad helix or W-arch appliances can be more suitable because they are less dependent on patient cooperation and deliver continuous rather than cyclical loads of force. Few clinicians would advocate using RMEs at the primary dentition stage, probably because there are documented cases of changes in facial morphology during this stage of development as a result of this form of expansion [58]. However, there are studies which document successful (and possibly more effective) correction of posterior cross-bites in the primary dentition with RMEs compared to conventional expansion appliances [33,48,53,59]. A cost-benefit analysis, as described by several authors, is a useful exercise to implement prior to undertaking a particular course of treatment [17,60,61].

Outcomes of correction

Although the physical limitations of each treatment modality can be measured, what is of greatest clinical interest is the outcome of implementing posterior cross-bite treatment in the primary dentition under controlled clinical research conditions. Unfortunately, few randomized or controlled clinical trials have been conducted which provide clinicians with the necessary evidence to support the implementation of many of these treatment modalities. Harrison [62], in an extensive literature search on posterior cross-bites in the primary and permanent dentition for the Cochrane Database of Systematic Reviews, only found 13 studies over the past 32 years to be of a sufficient standard to be classified either as randomized or controlled clinical trials. Of those studies relevant to the correction of posterior cross-bites in the primary dentition, only one controlled clinical trial provided a clinically significant outcome. This study, by Lindner [63], evaluated the effect of

Table 2. Treatment options for the posterior cross-bite in the primary dentition: their indications and contraindications, and the advantages and disadvantages of their use. References to studies which investigate each of the treatment modalities are given in parentheses.

Treatment modality and references	Effect and duration of treatment phase	Indications	Contraindications	Advantages	Disadvantages
No treatment [9,63]	Nil	When spontaneous correction of the cross-bite is more likely (e.g. post-habit cessation) When further orthodontic and/or surgical treatment is anticipated	Nil	No cost No intervention	Low success rate
Selective grinding (equilibration) at a plane approx. 45° to the tooth axis [9,63]	Removes premature contacts which contribute to a functional cross-bite Correction evident after a 5-year follow-up	Unilateral functional cross-bites as a result of mostly canine interference [63]	Uncooperative patients	Minimal cost Minimal intervention High success rate reported for indicated cases [63]	Few specific indications Persistent habits which contribute to cross-bite must first be eliminated
Bonded composite guiding cusps with equilibration and functional shift correction [66]	Removes premature contacts Approximately 6-month correction phase	Unilateral functional cross-bites and with maxilla: mandible intermolar arch width differential of less than 1·4 mm	Uncooperative patients	Minimal cost Minimal intervention High success rate reported for indicated cases [66]	Few specific indications Relies on patient cooperation. Persistent habits which contribute to cross-bite must first be eliminated
Slow and semi-rapid maxillary expansion (up to 2 mm per month) (1) Removable appliances: Upper expansion plate with jackscrew or Coffin spring [4,65,67,68]	Approximately 70–80% of the expansion is a result of buccal tipping and approximately 20–30% is caused by midpalatal suture opening [19] Requires over-expansion by 2–3 mm (1) Mean active phase of 4–7 months, followed by a retention phase of 2–4 months	Functional or skeletal cross-bites requiring up to 4 mm intermolar expansion Skeletal unilateral cross-bites can be corrected by modifications to some appliances for differential expansion between right and left sides	Uncooperative patients Good control of force Patients with missing primary molars or erupting permanent first molars	(1) Low level of technical difficulty and cyclical nature of (jackscrew appliance) Coffin spring can provide differential expansion along the arch	(1) High level of technical difficulty (Coffin spring) as a result of expansion forces (screw) Speech and swallowing Long treatment phase Not cost-effective Patient cooperation required Retention may be poor

Table 2. Continued

Treatment modality and references	Effect and duration of treatment phase	Indications	Contraindications	Advantages	Disadvantages
(2) Fixed banded or bonded appliances (bands on upper primary second molars or acrylic blocks bonded to upper primary canines and molars): Porter W-arch appliance [57,69,70] or Quad helix [19,57,71,72]	(2) Mean active phase of 2–3 months, followed by retention phase of 1–3 months	Some evidence to suggest that fixed appliances may achieve slightly more intermolar expansion (up to 6 mm) [71]	Uncooperative patients Patients with missing primary molars or erupting permanent first molars	(2) Continuous force during active phase of treatment Few visits required Cost-effective. May help eliminate a sucking habit Quad and W-arch can provide differential expansion along arch Easy-to-insert bonded appliances	(2) For appliances with bonded bite planes, plaque retention is high and removal is difficult For quad helix, posterior coils may impinge on palatal mucosa Relies on patient cooperation
(3) Transpalatal arch appliance with Coffin or omega loop [64,73] Rapid maxillary expansion (0·2–0·5 mm per day) (a) Haas expander [33,74] (b) Minne expander (may also be used for slow maxillary expansion) [48,53,55,57,58, 75,76]	Greater than 10 mm maxillary expansion after 2–4 weeks (up to 50% because of sutural separation) 3–6 months retention 2–4 mm over-expansion required Downward and forward displacement of maxilla Opening of a diastema between upper incisors Increase in width of floor of nasal cavity	Functional cross-bites caused by a maxillary constriction that contributes to an intermolar arch width differential of greater than 4 mm	Cross-bites with an intermolar arch width differential < 4 mm Patients with anterior open bite tendency and steep mandibular plane angle Uncooperative patients Patients with missing primary molars or erupting permanent first molars	Rapid expansion permits greatest orthopaedic effect of all appliances, helping to optimize skeletal expansion	May cause short-term dizziness following activation Diastema opening may alarm some patients or parents May produce significant undesirable alteration to nasal contours, such as nasal hump formation and paranasal swelling Longer retention periods required

selective grinding of premature contacts of primary teeth in 76, 4-year-old children from Stockholm, Sweden, exhibiting a unilateral posterior cross-bite. The outcome of this study was that an 85% success rate could be predicted if selective grinding was undertaken to correct these functional posterior cross-bites, as long as the initial inter-canine width differential was greater than 3·3 mm and there was virtually no discrepancy in intermolar width (less than 0·5 mm).

While the results of some studies which evaluate the effect of implementing various treatment modalities for posterior cross-bite correction in the primary dentition are inconclusive [64], many other studies cited in Table 2 report high success rates for treatment in the primary dentition. Although many of these studies would be excluded from such a rigorous assessment process as is carried out for reviews in the Cochrane Collaboration, there is still considerable clinical value in some of these research findings. In a longitudinal study by De Boer and Steenks [65], cross-bite correction with an upper removable expansion plate using a jackscrew successfully treated primary dentition posterior cross-bites in 23 out of 27 patients (85%) who initially participated in the study, after an 8-year follow-up. Out of the four remaining patients, two had dropped out of the study and two showed a relapse of the cross-bite, but had also developed a class III tendency. This study highlighted the difficulty in measuring success for cross-bite correction since 11 of the participating subjects had asked for advice at follow-up regarding a second orthodontic treatment phase, although in most cases (nine out of 11) this was because of a malocclusion that was unrelated to their cross-bite that was diagnosed at the initial assessment. The practitioner who is considering cross-bite correction must, therefore, decide whether intervention during the primary dentition will have significant benefits for an individual, given that a second phase of orthodontic treatment may be required later.

In terms of the harmful side-effects of treatment, the most common detrimental effects from correcting posterior cross-bites include the limited co-operation of young patients, gingival irritation and enamel decalcification. Other less commonly reported side-effects are changes to nasal morphology, sensations of dizziness and transient diastema opening between the central incisors following rapid expansion [55,58] and tooth sensitivity following selective grinding.

Conclusions

With up to 45% of posterior cross-bites in the primary dentition self-correcting with continued development of the dentition, there is no evidence at the present time to support the routine correction of cross-bites in the primary dentition, as opposed to the early mixed dentition.

The treatment of posterior cross-bites of the primary dentition can only be advocated when not treating this condition in the primary dentition predisposes the child to long-term detrimental consequences. A unilateral posterior cross-bite as a result of a functional displacement of the mandible is thought to carry such a risk if left uncorrected. The associated detrimental consequences could include TMJ dysfunction and deviation from normal facial aesthetics. Before any treatment is contemplated, however, it is important to determine that the child will be able to cooperate with appliance or other corrective therapy, and that there is an intact dentition that is not about to undergo significant change during the correction phase.

When treatment is indicated in the primary dentition, posterior cross-bites with an intermolar arch width differential of greater than one millimetre will require some form of upper-arch expansion with a removable or fixed appliance. The most popular and successful forms of expansion appliances reported for use in the primary dentition include the removable upper expansion plate with jackscrew or fixed lingual arch appliances. Although a considerable number of studies investigating the effects of correcting posterior cross-bites have been conducted, the outcomes of most of these cannot be judged to be clinically significant. Selective grinding of premature contacts of the primary teeth is the only clinically proven treatment modality for posterior cross-bite correction in the primary dentition, but is only indicated for mild forms of unilateral posterior cross-bite associated with a functional shift.

Résumé. Les enfants présentant un inversé d'articulé en denture temporaire peuvent être prédisposés à long terme à des conséquences défavorables en l'absence de traitement. Le moment le plus approprié pour ce traitement reste l'objet de controverse.
Objectifs. Cette revue a pour objectif d'évaluer le besoin de correction des inversés d'articulé postérieurs en denture temporaire, à partir des connaissances actuelles sur l'étiologie, la possibilité d'auto-correction et les conséquences de différentes

formes de cette malocclusion persistant en denture mixte et permanente. Une revue des options de traitement pour la prise en charge de ce trouble sera également présentée.
Méthodes. Analyse de la littérature relative à l'épidémiologie et à la prise en charge des inversés d'articulés postérieurs en denture temporaire.
Conclusion. Les inversés d'articulés postérieurs en denture temporaire sont relativement communs et de causes multiples. En raison de la proportion significative de correction spontanée, l'intervention systématique ne peut être admise. L'inversé d'articulé consécutif à un déplacement fonctionnel de la mandibule est une des rares formes à pouvoir être traitées en denture temporaire. Des études ultérieures sont nécessaires quant à la prise en charge de ce problème.

Zusammenfassung. Kinder mit posteriorem Kreuzbiss im Milchgebiss könnten, falls eine Therapie unterbleibt, prädisponiert sein für ungünstige Langzeitfolgen. Der richtige Behandlungszeitpunkt für diese Situation wird in der Literatur kontrovers diskutiert.
Ziele. Ziel dieser Übersichtsarbeit ist es, die Indikation zur Behandlung eines posterioren Kreuzbisses im Milchgebiss zu evaluieren auf der Basis des derzeitigen Verständnisses der Ätiologie, Wahrscheinlichkeit der Selbstkorrektur sowie die Folgen einer Persistenz verschiedener Arten des posterioren Kreuzbisses bis in die Wechselgebissphase oder die bleibende Dentition. Ein Überblick über die veröffentlichten Therapiekonzepte wird ebenfalls gegeben.
Methoden. Literatur, die sich mit Epidemiologie und Therapie des posterioren Kreuzbisses im Michgebiss auseinandersetzt wird herangezogen.
Schlussfolgerungen. Der posteriore Kreuzbiss im Milchgebiss ist relativ häufig, die Ursachen sind vielfältig. Aufgrund einer hohen Raten an Selbstkorrektur nach Abschluss der Milchgebissphase kann eine routinemäßige Therapie im Milchgebiss nicht empfohlen werden. Der unilaterale posteriore Kreuzbiss als Folge einer funktionellen Mandibulaverlagerung ist eine der wenigen Ausnahmen, welche eine Therapie erfordern können. Weitere Untersuchungen auf diesem Gebiet sind erforderlich.

Resumen. Los niños que presentan una mordida cruzada posterior en la dentición temporal pueden estar predispuestos a consecuencias negativas si la alteración se deja sin tratar. Existe controversia en la literatura sobre cuál es el momento más apropiado para tratar esta alteración.
Objetivos. El propósito de esta revisión es evaluar la necesidad de corregir las mordidas cruzadas posteriores en la dentición temporal basándose en el conocimiento actual de la etiología, probabilidad de autocorrección y consecuencias de las diferentes formas de esta maloclusión cuando persisten en la dentición mixta y permanente. También se presentará una revisión de las opciones de tratamiento de esta alteración.
Métodos. Se revisará la literatura perteneciente a la epidemiología y tratamiento de las mordidas cruzadas posteriores en la dentición temporal.
Conclusión. Las mordidas cruzadas posteriores en la dentición temporal son relativamente comunes y sus causas son numerosas. Debido a una proporción significativa de mordidas cruzadas posteriores autocorregidas después de la dentición temporal, no puede recomendarse su corrección rutinaria en dentición decidua. Una mordida cruzada posterior como resultado de un desplazamineto funcional de la mandíbula es una de las pocas maloclusiones que deberían considerarse para su corrección en la dentición temporal. Son necesarias más investigaciones en el tratamiento de esta alteración.

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