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Research Paper

Rapid correction of anterior crossbite using a bonded compomer slope

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ABSTRACT

An anterior crossbite can hardly be corrected spontaneously. When diagnosed in a mixed dentition or in an early permanent dentition, an interceptive orthodontic treatment becomes imperative. The objective of this paper is to report a rapid, cheap and effective interceptive orthodontic treatment of an anterior crossbite in a pediatric patient in mixed dentition. A male patient aged 10 years old reported an important aesthetic embarrassment of his smile as well as, functional problems. An anterior crossbite of tooth 2.1 was diagnosed, hiding almost the entire clinical crown. Dental crossbite was corrected by bonding a compomer slope to the incisal edge of the mandibular incisor with an angle of about 45° to the longitudinal axis of the tooth. Correction was achieved within 3 weeks of treatment, with no damage to the tooth or periodontal tissue. As a conclusion, a simple bonded compomer slope, done in just one clinical appointment can solve both aesthetic and functional problems in a very simple way. It is cheap, cost-effective and very easy for patients to accept. The technique is so elementary, that not only pediatric dentistry experts but every general dentist is able to perform it. If we are able to treat an anterior crossbite at the exact moment of the diagnosis, then, the need for long term orthodontic treatment can reduced, thereby, giving the kids a chance for growing up in a more healthy way.

Keywords: Compomers, interceptive orthodontics, malocclusion, traumatic dental occlusion.

INTRODUCTION

An anterior crossbite is defined as a malocclusion problem in which one or more maxillary incisors occlude lingually to mandibular incisors (Bindayel, 2012; Vadiakas and Viazis, 1992), that is on labiolingual unusual relation (Olsen, 1996). Dental crossbites involves a tip alteration only of the affected teeth, and does not involve the alveolar bone. This condition has an incidence of 4 to 5% (Bindayel, 2012; Olsen, 1996), depending on the studied population and is usually possible to be diagnosed in the early mixed dentition period. Anterior single tooth crossbite was found to be significant with increase in age (Bhayya et al., 2012). This maloclusion may be found in primary or permanent teeth, but is more frequent in the permanent teeth.

The specific etiology responsible for this type of malocclusion is still not known, but we must always consider: traumatic injuries to the primary dentition that cause a lingual displacement of the permanent tooth bud, over-retained primary tooth, mesiodens labially placed, fibrous tissue barrier, inadequate arc length with habits and cleft lip repaired (Bayrak and Tunc, 2008; Asher et al., 1986).

This type of malocclusion causes aesthetic and functional problems (Bindayel, 2012), hence, an early treatment in the mixed dentition is recommended (Jirgensone et al., 2008). Even if an interceptive treatment is accomplished, it does not mean that there is no need for permanent orthodontic treatment (Jirgensone et al., 2008). When an an anterior crossbite in the mixed dentition stage is corrected it prevents reoccurrence of the problem in the future, developing skeletal problems and avoiding the establishment of a malocclusion class III (Jirgensone et al., 2008).

Figure 1: Single tooth anterior crossbite.

The permanence of this crossbite may also have consequences of mandibular displacement, growth restriction yaws, traumatic occlusion and increased treatment time (Mok and Wong, 2009).

Various treatment methods such as reversed stainless steel crowns, fixed acrylic planes, bonded resin-composite slopes and removable acrylic appliances have been proposed to correct anterior dental crossbite (Abraham et al., 2016).

CASE DESCRIPTION

A male patient aged ten years old, attended a Pediatric Dentistry appointment in the Universidade Católica Portuguesa in February, 2017, complaining about aesthetic problems. His chief complaint was that he did not like his smile and that he was ashamed of smiling, admiting this as the reason why the appointment was tagged. He complained having the habit of hiding his teeth with the hand. The child, when questioned, said he had no other habits, however, his mother admited that he usually bites his upper lip.

According to the mother, the child was healthy, with no significant medical history or known allergies. The clinical examination showed an anterior crossbite of tooth 2.1, hiding almost the entire clinical crown (Figure 1). Some carious lesions were observed in the primary teeth (5.5 and 6.5), a caries on the permanent tooth 1.6 was also diagnosed and we verified that he had a reasonable plaque control. In panoramic X-ray occlusal composite restorations were observed in teeth 2.6, 3.6 and 4.6. and caries lesions were confirmed. Dental eruption was normal for the chronological age. After a clinical intraoral examination, diagnosis pointed to an anterior crossbite of tooth 2.1 and class I of Angle. The main objectives of the interceptive orthodontic treatment plan were to eliminate the anterior crossbite and to establish stable occlusion with acceptable anterior dental esthetics.

Some treatment options were considered. The first option was to make impressions and to ask the laboratory for an acrylic removable appliance with Adams hooks in maxillary permanent molars, acrylic occlusive guides to increase vertical dimension and a protrusion spring in tooth 2.1. The dentist has to activate the spring to move the tooth affected by the crossbite. This option has a major trouble: it was necessary to increase vertical dimension because tooth 2.1 was almost entirely hiden. The second option was to bond the compomer slope in the incisal edge of the mandibular incisor. When discussed with the child parents, we all agreed that the objective was a simple, efficient and economic treatment. In order to equate all of these parameters, it was decided unanimously to execute the compomer slope.

The case reported was done in mixed dentition and the child had Class I molar and canine relationships. There was sufficient mesiodistal distance to achieve labial movement of the maxillary tooth. For the desired results, the slope was bonded to teeth 3.1 and 3.2 (both lower teeth were involved in the crossbite) with an 45° inclination to cause occlusion of the crossed tooth (2.1) and consequently posterior desocclusion (Figure 2).

The ramp was bonded through a simple resin adhesion protocol:

Figure 2: Lemon coloured compomer slope bonded to the teeth 3.1 and 3.2.

Figure 3: Partial correction of the anterior crossbite.

- Prophylaxis;
- Relative isolation;
- Application of 37% phosphoric acid for 15 s;
- Removal of phosphoric acid with washing and subsequent drying with the air jet;
- Application of adhesive system with microbrush, mild air-drying with the air jet and light cure of 20 s (repeat this section twice);
- Application of the compomer (Twinky Star® by Voco®), by layers, light cure 20 s per layer to form the desired 45° of the ramp;
- Light cure for 20 s at the end;
- Finishing and polishing.

We used the compomer in the color chosen by the patient (lemon). The compomer material choice was made to later enable an easy and safe removal by having a contrasting color when compared to the tooth itself, leading to no doubts about the tooth limits.

After a week, the child came to a control appointment (Figure 3) and it was observed that the tooth was no longer crossed. The absolute gladness he showed was

Figure 4: Complete correction of the anterior crossbite.

Figure 5: Just after removing the compomer slope.

unforgettable. It was explained to the patient and the parents that it would be better to maintain the treatment longer for stability control of the result already achieved. As such, a new control appointment was scheduled after three weeks (Figure 4). The decision to remove the slope was only made in the 6th week (Figure 5). After one year,

Figure 6: Follow-up of one year.

another control appointment was scheduled (Figure 6).

RESULTS AND DISCUSSION

An anterior crossbite can hardly be corrected spontaneously. When diagnosed in a mixed or in an early permanent dentition, an interceptive orthodontic treatment becomes imperative. There are many treatment options available for correction of crossbites in the literature. They all include the evaluation of number and site of the tooth/teeth involved, the stage of dentition development and its etiology. It is of extreme importance to note that using bonded compomer slopes is not recommended in all types of anterior crossbites. To perform this, the patient should have molar class I, enough space in the arch to reposition the tooth and a sufficient overbite to maintain the tooth later in its new position (Prakash and Durgesh, 2011). The main goal of all techniques is to change the affected maxillary tooth or teeth position, moving them towards the labial side and creating a stable overbite relatioship to prevent undesired outcomes like enamel abrasions, periodontal disease, anterior teeth fractures and to improve esthetic and occlusion.

The technique used is easy to perform, safe and inexpensive. It also has the advantage of not depending on the patient's collaboration in contrast to other treatments (Bayrak and Tunc, 2008; Prakash and Durgesh, 2011). On the other hand, compomer slopes should not stay in the mouth for more than 6 weeks since they run the risk of causing open bite in the patient (Prakash and Durgesh, 2011). Relapse is usually prevented by a normal overjet/overbite relationship and the pre-assumption that the patient was in a molar class I.

In this case, the treatment plan could have been different. The possibilities of treatment were not restricted. An anterior crossbite correction can be suitably made by a tongue blade therapy, inverted stainless steel crowns, Catlan's appliance (lower inclined bite plane) or a removable apparatus (Hawley retainer with previous Z-springs) (Dean, 2016; Prakash and Durgesh, 2011). Our choice for bonded compomer slopes was due to the fact that it is the most cost benefit ratio treatment.

In a nutshell, this technique proved to be efficient, quick and economical in the case described, surprassing our expectations and the patient's. It should be emphasized that "the best time to treat an anterior crossbite is during diagnosis". If we are able to do so, we can reduce the need for long term orthodontic treatment, giving the kids a chance for growing up in a healthy way.

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REFERENCES

Abraham K, James A, Thenumkal E, Emmatty T (2016). Correction of anterior crossbite using modified transparent aligners: An esthetic

approach. Contemp. Clin. Dent. 7(3): 394.
Asher R, Kuster C, Erickson L (1986). Anterior dental crossbite correction using a simple fixed appliance: case report. Pediatr. Dent. 8(1): 53–55.
Bayrak S, Tunc E (2008). Treatment of anterior dental crossbite using bonded resin-composite slopes: case reports. Eur. J. Dent. 2(4): 303–6.
Bhayya D, Shyagali T, Dixit U, Shivaprakash (2012). Study of occlusal characteristics of primary dentition and the prevalence of maloclusion in 4 to 6 years old children in India. Dent. Res. J. 9(5): 619–23.
Bindayel N (2012). Simple removable appliances to correct anterior and posterior crossbite in mixed dentition: Case report. Saudi Dent. J. 24(2): 105–13.
Dean J (2016). *McDonald and Avery's Dentistry for the Child and Adolescent*. 10.ª ed. Elsevier.
Jirgensone I, Liepa A, Abeltins A (2008). Anterior crossbite correction in primary and mixed dentition with removable inclined plane (Bruckl appliance). *Stomatologija.* 10(4): 140–44.
Mok C, Wong R (2009). Self-correction of anterior crossbite: a case report. Cases J. 2(1): 6967.
Olsen B (1996). Anterior crossbite correction in uncooperative or disabled children. Case reports. Aust. Dent J. 41(5): 304–9.
Prakash P, Durgesh B (2011). Anterior Crossbite Correction in Early Mixed Dentition Period Using Catlan's Appliance: A Case Report. ISRN Dentistry. Pp.1–5.
Vadiakas G, Viazis A (1992). Anterior crossbite correction in the early deciduous dentition. AJO-DO. 102(2): 160–62.

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