INTRODUCTION

Anterior crossbite is the term used to define an occlusal problem involving palatal positioning of the maxillary anterior teeth relative to the mandibular anterior teeth. Anterior crossbites can be either dental or skeletal in origin, whereas, anterior dental crossbites originate from the abnormal axial inclination of the maxillary anterior teeth. Anterior skeletal crossbites are most often associated with a skeletal problem, such as mandibular prognathism and midface deficiency. Differential diagnosis of dental versus skeletal anterior crossbite is essential in determining clinical treatment.

Anterior dental crossbite has a reported incidence of 4-5% and is usually the result of a palatal malposition of the maxillary incisors resulting from a lingual eruption path. Other etiological factors include trauma to the primary maxillary incisors resulting in lingual displacement of the permanent tooth buds; presence of supernumerary anterior teeth; crowding in the incisor region; a habit of biting the upper lip; an over-retained, necrotic or pulpless deciduous tooth or root; delayed exfoliation of the primary incisors; and odontomas.

The main goal in treating anterior dental crossbite is to tip the affected maxillary tooth or teeth labially to a point where a stable overbite relationship prevents relapse. Treatment may involve lingual movement of a mandibular tooth, labial movement of a maxillary tooth, or both. Various techniques have been used to achieve this goal, such as tongue blades, removable appliances, and reversed stainless steel crowns, removable acrylic appliances with lingual springs and fixed appliances. In addition to being inexpensive and not causing damage to associated soft-tissue, given the young ages of patients, resin inclined slope should also be easy to place and remove, comfortable and easily tolerated.

TECHNIQUE USED

A 20 year old girl presented with a chief complaint of backwardly placed upper front teeth. Medical and dental history of the patient was noncontributory. Clinical examination revealed first permanent molars were in Angle’s Class I occlusion. The right permanent canine was in crossbite relation and so was second premolar (Fig.1a & 1b) Following clinical and radiographic examinations, the decision was made to create a bonded resin-composite slope (Fig. 2a & 2b). Patient gave her
written informed consent for the treatment. The incisal half surface of the occluding right mandibular canine was etched with 37% phosphoric acid for 15 seconds rinsed and dried. An adhesive system was applied and cured for 20 sec using a visible light unit. Composite resin was formed into an inclined slope and applied to the occluding surface of the canine to create a slope of 3–4 mm in thickness at a 45° angle to the longitudinal axis of the tooth. The composite was cured and polished using a polishing disc. The occlusion was checked and typically, posterior teeth do not contact immediately following slope placement; however, normal posterior occlusion is re-established soon. Patient was motivated to maintain good oral hygiene and recalled after 1 week to clinically evaluate the treatment progress and periodontal health of the anterior teeth. Crossbite correction was completed in 1–2 weeks. Following correction, the resin slope was removed with a diamond bur at low speed, the enamel surface was polished using aluminum oxide finishing discs, and topical fluoride was applied. (Fig 3a & 3b)

It is best to use a shade of material that is easily differentiated from the shade of the tooth. The difference in shade makes it easier to recognize the resin material for removal after treatment.

Figure 1a & 1b: Pre-treatment photographs depicting right permanent canine and second premolar in crossbite relationship.

Figure 2a & 2b: Bonded resin-composite slope created on mandibular right permanent canine.

Figure 3a & 3b: After crossbite correction & slope removal.
DISCUSSION
Anterior dental crossbite requires early and immediate treatment to prevent abnormal enamel abrasion, anterior teeth mobility and fracture, periodontal pathosis and temporomandibular joint disturbance. The main goal of treatment is to tip the affected maxillary tooth or teeth labially to the point where a stable overbite relationship exists. Relapse is usually prevented by the normal overjet/overbite relationship that is achieved.

Different techniques have been used to correct anterior dental crossbite. The reversed stainless steel crown is a well-known method for correcting anterior dental crossbite. The chief disadvantage of this method is the difficulty in adapting a preformed crown to fit the tooth in crossbite. Furthermore, the reversed stainless steel crown is an unaesthetic treatment that is often rejected by patients. The tongue blade can also be an effective method of treatment during the early phase of eruption; however, it requires total cooperation from the patient, which in most cases is difficult to obtain.

Similarly, the use of removable acrylic appliances with posterior bite opening platforms and anterior finger springs for labial tipping of maxillary teeth also requires patient cooperation. A lower acrylic inclined-bite-plane is another effective treatment method; however, it requires a laboratory phase, which increases the price of treatment, and the cement used with this type of appliance may cause gingivitis.

Because of the disadvantages of the methods mentioned above, the cases report described above was treated using a bonded resin-composite slope. This method represents a safe, quick, easy and esthetically acceptable alternative for the correction of anterior dental crossbite. The procedure is low-cost, involves no discomfort, and it can be completed in only a few visits to the clinic. Treatment time is short, since retention is achieved once the tooth is in the correct position, and it is also low-cost. The correction of anterior dental crossbite was observed within 1–2 weeks, with no damage to teeth or marginal periodontal tissue.

When considering anterior crossbite correction using bonded resin-based composite or compomer material, one must rule out skeletal class III malocclusion. In a classic demonstration of Newton’s third law of motion, the resin slope functions to tip maxillary canine tooth labially while the mandibular canine tooth is tipped slightly in the lingual direction. If crossbite exists because of mandibular prognathism or a posteriorly positioned maxilla (or both), bonded resin slopes are not useful for crossbite correction.

When the resin slope is removed, care must be taken not to damage the enamel surface. We recommend slow speed diamond or carbide burs and aluminum oxide finishing and polishing disks for removal of the compomer material. High speed cutting is useful to remove a bulk of material, but the operator has more control using the slow speed handpiece for the resin bonded close to the surface.

CONCLUSION
This paper describes the use of bonded resin-composite slopes for the management of anterior crossbite. Procedure is cost effective, involves fewer clinical visits, with less patient discomfort and no need for retention. Thus this method is an esthetically acceptable alternative for the correction of anterior dental crossbite.

REFERENCES

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