

Treatment of crossbite

■ The first step in the management of crossbite is elimination of the factors that may lead to the cross bite E.g.

- Removal of occlusal prematurities.
- Extraction of supernumerary tooth, before they cause displacement of other tooth.
- Habit breaking appliance.
- Referring the patient with breathing problem to ENT specialist

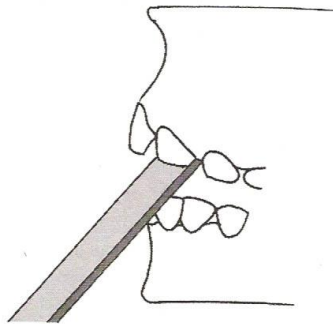
Depending upon the age of the patient, the eruption status of the teeth and the space availability various appliances have been designed to correct anterior cross bites

+ CORRECTION OF ANTERIOR CROSS BITE IN THE PREADOLESCENT AGE GROUP

1. Use of Tongue Blade

A tongue blade resembles a flat ice-cream stick. Used when a cross bite is seen at the time the permanent teeth are making an appearance in the oral cavity.

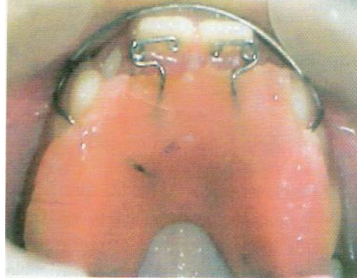
- It is placed inside the mouth contacting the palatal aspect of the maxillary teeth.
- Upon slight closure of jaw the opposing side of the stick come in contact with the labial aspect of the opposing mandibular tooth acts as a fulcrum.
- Only effective till the clinical crown not completely erupted in the oral cavity.
- Used only if sufficient space is available for the correction.
- Patients cooperation is required.



This is continued for 1-2 hours for about 2 weeks

[2] Double cantilever spring / z-spring

- Is one of the most frequently used appliance to correct anterior tooth/ teeth cross bites.
- Effective only when there is enough space for aligning the teeth.



(3) Screw appliance

Acrylic appliances incorporating various size screws can be used to correct either individual tooth or segmental cross bites.

- *Micro screw* are the most comfortable for the patient and can be used on individual teeth. Multiple micro-screws can be used to correct individual teeth in a segmental cross bite.
- *Mini-screws* are also used for the same purpose but are capable of moving up to two teeth.
- *Medium screws* are used to correct segmental cross bites. They are larger and are capable of moving 4-6 teeth in a segment.
- *3-D (three dimensional) screws* are capable of correcting posterior as well as anterior cross bites simultaneously. Appliances incorporating a 3-D screw, achieve an overall increase in the circumference of the maxillary arch. They are ideal to treat the anterior cross bites associated with pseudo-Class III malocclusions
- Generally, one full turn of the screw brings about 0.8 or 1 mm expansion that is one fourth turn would bring about 0.2/0.25 mm expansion.

[4] Face mask (or face mask along with RME)

Used to correct skeletal anterior cross bite (Anterior cross bite due to actual skeletal deficiency of the maxilla)





[5] Chin cap appliance

Used to correct or prevent the anterior cross bite due to a prominent mandible.




- **Chin cap appliance rotate mandible backward and downward.**

[6] Frankel III appliance Used to correct skeletal class III Malocclusion.

The following factors should be considered in treatment of anterior crossbite

-  **What type of movement is required? If tipping movements will suffice, a removable appliance can be considered, however, if bodily or apical movement is required then fixed appliances are indicated.**
-  **How much overbite is expected at the end of treatment? For treatment to be successful there must be some overbite present to retain the corrected incisor position. However, when planning treatment it should be remembered that proclination of an upper incisor will result in a reduction of overbite compared with the pretreatment position.**
-  **Is there space available within the arch to accommodate the tooth/teeth to be moved? If not, are extractions required and if so which teeth?**
-  **Is movement of the opposing tooth/teeth required? If reciprocal movement is required, a fixed appliance is indicated**

Provided that there is sufficient overbite and tilting movements will suffice, treatment can often be accomplished with a removable appliance. The appliance should incorporate the following features:-

-  **good anterior retention to counteract the displacing effect of the active element (where two or more teeth are to be proclined, a screw appliance may circumvent this problem);**
-  **buccal capping just thick enough to free the occlusion with the opposing arch (if the overbite is significantly increased a flat anterior bite-plane may be utilized instead);**
-  **an active element, for example a Z-spring.**

Fixed appliances are indicated in the following cases:

- The apex of the incisor in crossbite is palatally positioned.**
- If there will be insufficient overbite to retain the corrected incisor(s), consideration should be given to using fixed appliances to move the lower incisor(s) lingually at the same time as the upper incisor(s) is moved labially in order to try and increase overbite.**
- Other features of a malocclusion necessitate the use of fixed appliances**

MANAGEMENT of posterior crossbite

Treatment plan considerations

- ➡ Skeletal and dental contribution to crossbite.**
- ➡ Age of the patient**
- ➡ Functional contribution to crossbite.**

Rationale for early treatment

Posterior crossbite should be treated as early as possible even in the primary dentition.

- Early correction will eliminate mandibular shift on closure and reduce the possibility of mandibular skeletal asymmetry(asymmetric mandibular growth).**
- Research has shown that displacing contacts may predispose towards temporomandibular joint dysfunction syndrome in a susceptible individual**
- Correcting posterior crossbite in the mixed dentition increases arch circumference and provides more room for the permanent teeth to erupt.**
- Reduces dental arch distortion.**

The various treatment modalities for posterior crossbite are :-

- 1) Occlusal equilibrium.**
- 2) Coffin spring.**
- 3) Cross elastics.**
- 4) Soldered W –arch (Porter appliance).**
- 5) Quad Helix.**
- 6) Removable appliance.**
- 7) Rapid maxillary expansion (RME).**
- 8) Ni-Ti expanders.**
- 9) Oral screening.**
- 10) Fixed orthodontic appliances.**

Unilateral crossbite

- For crossbite correction of a premolar or molar, consider the use of a T -spring or screw section, respectively, on an URA**
- If reciprocal movement of opposing teeth is required, use fixed attachments and cross elastics.,**
- or extraction of a tooth in crossbite if there is more marked displacement**
- For correction of unilateral buccal segment crossbite associated with a mandibular displacement, use an URA with a midline expansion screw and buccal capping or quadhelix, provided teeth are not tilted buccally**

Correction of true unilateral crossbite

- These are treated by asymmetric expansion of upper arch to move teeth on the constricted side. Asymmetric W arch with different length arms. The side of the**

arch to be expanded has fewer teeth than the anchorage unit. However, some bilateral expansion must be expected.

- In adult if there is unilateral buccal segment crossbite with no mandibular displacement, as there is no functional problem, correction is not usually indicated unless it is part of a more comprehensive treatment

Bilateral posterior crossbite

- ➡ Skeletal maxillary constriction is characterized by a narrow palatal vault and can be corrected by opening the midpalatal suture.
- ➡ Like all craniofacial sutures the midpalatal suture becomes more tortuous and interdigitated with increasing age.
- ➡ In children up to 9 or 10 years (skeletal age) expansion of suture is easy and can be accomplished with almost any type of expansion device.
- ➡ Split-plate removable appliance with expansion screw can be used for primary or mixed dentition child and will produce some opening of the midpalatal suture in addition to dental expansion, this type depends on patient compliance
- ➡ Lingual arch either of W arch or quad helix design. Both produce slow expansion and deliver a force of few hundreds grams and produce both skeletal and dental expansion.
- ➡ Heavy forces and rapid expansion are not indicated in young children, since there is significant risk of distortion of nose
- ➡ By adolescence the interdigitation of the suture has reached the point that a rigid expansion screw with considerable force is required to create micro fractures before the suture can open.
- ➡ Rapid maxillary expansion of the midpalatal suture can be tried, but no later than early teenage years

The rapid maxillary expansion (RME) type of appliance which produces high forces capable of splitting the mid-palatine suture and bringing about skeletal changes within a

matter of days (0.5mm/ day). The screw is turned twice daily, usually over an active treatment period of 2 weeks. The RME screw can be incorporated in two types of appliances

- one, the banded RME, and
- The second kind, the cemented RME

- ➔ As half of the dental expansion is lost, some overexpansion is advisable.
- ➔ Cross-elastics: from the lingual of upper molars to the buccal of lower molars. This method is also useful when there is true unilateral crossbite.

After correction of crossbite retention is achieved using heavy rectangular archwire

- ➔ In adults bilateral posterior crossbite usually accepted, as a functional problem is rare & partial relapse may result in a unilateral crossbite with displacement..

- In all patients whether children or adolescents, the crossbite should be overcorrected so that the palatal cusps of upper teeth occlude on the lingual inclines of buccal cusps of lower molars.
- After active treatment the appliance is left passively in place for 3 months.
- A removable retainer that covers the palate is needed to prevent relapse for 6 months or more.