

DEFINITION OF CROSSBITE

According to **Graber**:

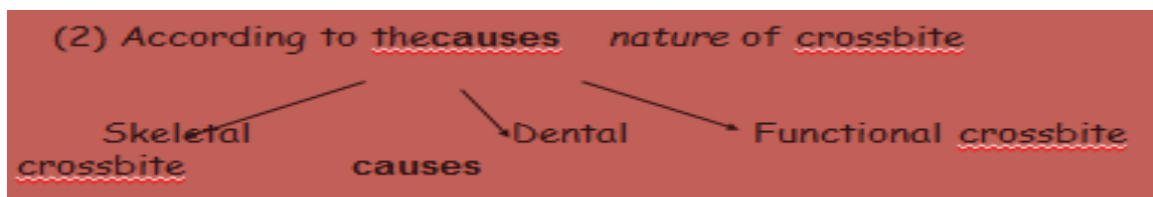
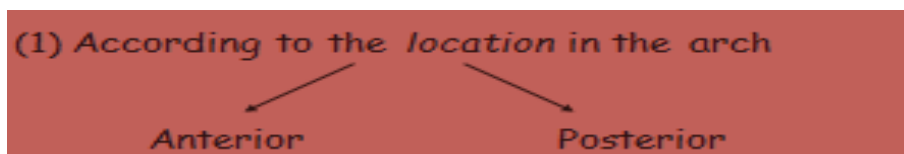
A condition where one or more teeth may be malposed abnormally-buccally , labially or lingually with reference to opposing tooth or teeth.

OR

-A deviation of the normal faciolingual relationship of teeth of one arch with those of opposing arch when the two dental arches are brought into centric occlusion

Other definition

- -Abnormal occlusion in the transverse plane
- OR
- -Reverse overjet of one or more teeth
- -a discrepancy in the buccolingual relationship of the upper and lower teeth.
- Under **normal** circumstances- maxillary arch overlaps mandibular arch both labially and buccally.
- But when mandibular teeth (single tooth or a segment of teeth) overlap maxillary teeth labially or buccally depending upon their location in the arch a **crossbite** is said to exist

CLASSIFICATION OF CROSSBITES

⊙ Based on the structure involved:

- **Dental crossbite:** crossbite is confined to the dentition, mainly lingual tipping of upper teeth or less frequently buccal tipping of lower teeth.
- **skeletal crossbite:** crossbite involving the skeletal structures mainly maxillary constriction.
- **Functional crossbite:** Occlusal interference will lead to mandibular shift on closure resulting in anterior or unilateral posterior crossbite

Anterior cross bite

Single tooth anterior cross bite

Segmental anterior cross bite

The Simple Anterior Crossbite

The Functional Anterior Crossbite

(pseudo Class III)

The Skeletal Anterior Crossbite





Simple anterior crossbites are generally the result of an abnormal eruption of the permanent incisors.

The term simple is used because these crossbites can easily be corrected using removable appliances by practitioners with limited experience in orthodontics




Various etiologic factors can be involved including

- ❖ trauma to the primary incisors with displacement of the permanent tooth bud;
- ❖ delayed exfoliation of a primary incisor with palatal deflection of the erupting permanent incisor;
- ❖ supernumerary anterior teeth; odontomas;
- ❖ congenitally abnormal eruption patterns ,
- ❖ and an arch perimeter deficiency

Patients who have a simple anterior dental crossbite exhibit the following characteristics

-  a. The crossbite usually involves only one or two teeth.
-  b. The facial profile is usually normal in centric relation and centric occlusion.
-  c. Many of these patients exhibit Class I skeletal patterns.
-  d. There is usually no shift from rest to intercuspatation, as the teeth involved in the crossbite have moved to accommodate the interference.

Functional cross bites

-  These cross bites are usually caused due to the presence of occlusal interferences during the act of bringing the jaws into occlusion result in deviation of mandible into an abnormal but often a more comfortable position.
-  These can be caused by the early loss of deciduous teeth, decayed teeth or ectopically erupting teeth.
-  If not corrected early, these can ultimately lead to skeletal cross bites.

The Skeletal Anterior Crossbite

1. Anterior cross bite due to maxillary retrognathism

2. Anterior cross bite due to mandibular prognathism

3. Anterior cross bite due to maxillary retrognathism and mandibular prognathism

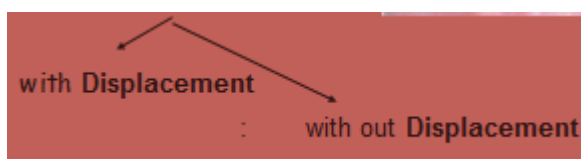
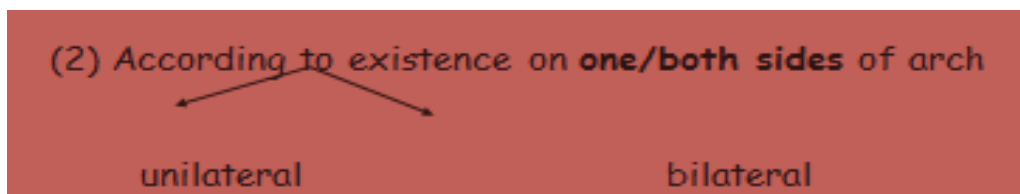
Its characteristics

- In centric occlusion their facial profile will be straight or concave.
- There will be a Class III molar relationship and an anterior crossbite.
- The arc of mandibular closure remains smooth without any occlusal interferences
- In an attempt to compensate for the skeletal discrepancy during growth, the maxillary incisors usually become proclined and the mandibular incisors become retroclined

Anterior crossbite may lead to:

- ❖ tooth attrition,
- ❖ gum recession and periodontal pockets,
- ❖ and most dangerously mandibular displacement, mostly the forward postural type which may mask the increase in overjet in the central incisor area.
- ❖ may lead to temporomandibular disorder

Classification ❖



(3) **Classification** Based on **the position of upper molars:**

- **Palatal Posterior Crossbite:** is the most common and refers to a condition where buccal cusps of one or more maxillary posterior teeth occlude lingual to buccal cusps of mandibular teeth.
- **Buccal Crossbite (Scissors Bite):** the palatal cusps of maxillary teeth occlude buccal to mandibular teeth. This type is less common and associated with underlying skeletal discrepancy, often Class II malocclusion

skeletal posterior crossbite

- It results from discrepancy in **structure** of maxilla and mandible

or – **malposition of the jaw**.

- A basic discrepancy in the **width of arches** is noted.

- A narrow maxillary arch or a wide mandibular arch often associated with a posterior crossbite.

Generally, the greater the number of teeth in crossbite, the greater is the skeletal component of the aetiology

For this reason palatal crossbites of an entire buccal segment are most commonly associated with Class III malocclusions,

and Scissors bite crossbites are associated with Class II malocclusions.

Anterior crossbites are associated with Class III skeletal patterns

Displacement: on closing from the rest position the mandible encounters a deflecting contact(s) and is displaced to the left or the right, and/or anteriorly, into maximum interdigitation

Diagnosis

✓ **Clinical Examination:**

It is important to determine whether a unilateral crossbite is associated with lateral mandibular shift, this is achieved by examining mandibular position in centric relation and centric occlusion.

Unilateral posterior crossbite with lateral shift may result from:-

1. **Occlusal interferences from primary canine: there is normal occlusal relations at initial contact but in centric occlusion there is mandibular shift leading to unilateral crossbite.**

2. **Or** the underlying aetiology is usually that the maxillary arch is of a similar width to the mandibular arch (i.e. it is too narrow) with the result that on closure from the rest position the buccal segment teeth meet cusp to cusp. In order to achieve a more comfortable and efficient intercuspation, the patient displaces their mandible to the left or right

✓ **Marked bilateral narrowing produce no interference and the patient will have bilateral crossbite in centric relation.**

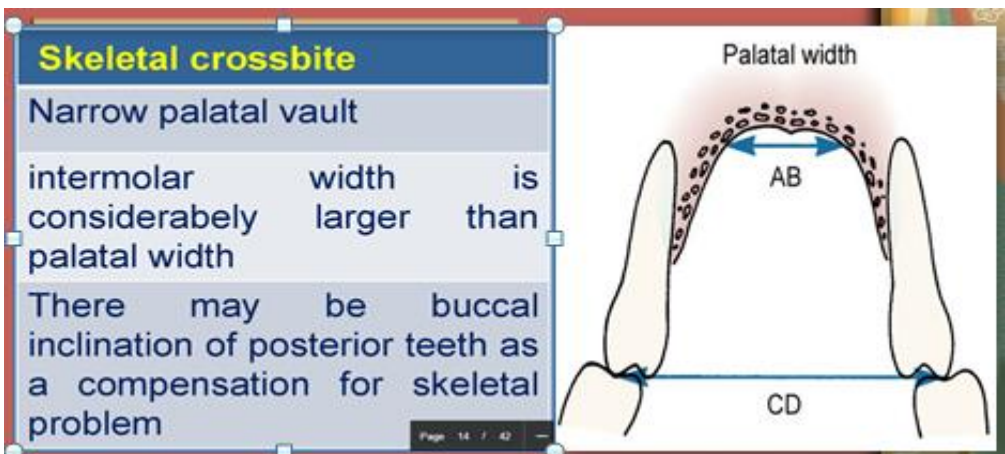
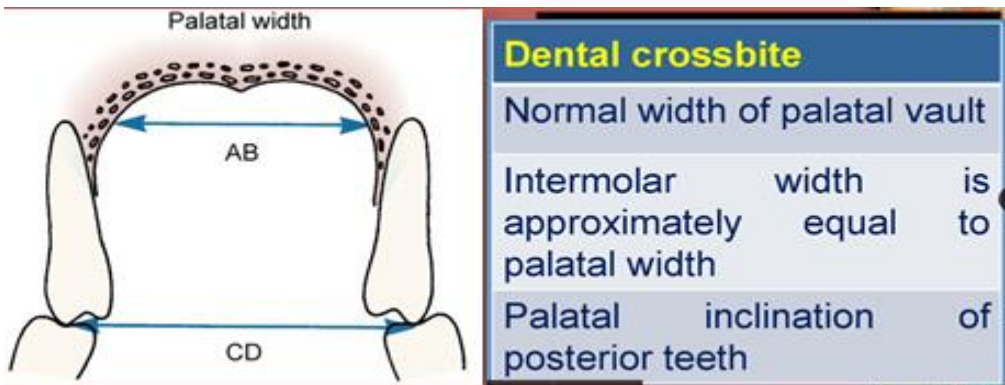
✓ **Less frequently unilateral posterior crossbite is caused by true unilateral narrowing of the upper arch, the patient has crossbite in centric relation and centric occlusion.**

✓ **Study cast analysis:**

dental and skeletal transverse dimensions can be recorded using study cast by:

- **Measuring the width of palatal vault.**
- **Measuring the intermolar distance.**

These 2 measurements should be compared to each other to verify the skeletal and dental contribution to crossbite.



- ☑ In normal occlusion the arch width between tips of MB cusps of upper first molars should be 2 mm greater than the width between buccal grooves of lower molars.
- ☑ Arch width measurement is used to estimate the amount of expansion needed to correct the crossbite:
 - maxillary intermolar width – mandibular intermolar width= intermolar difference.
 - expansion needed= intermolar difference +2mm.

Etiology of skeletal crossbites


- 1) Anteroposterior skeletal problem, sever maxillary retrognathism or mandibular prognathism can result in posterior crossbite even with normal transverse maxillary width.
- 2) Narrow upper arch.
- 3) Unilateral hypo/hyperplastic growth of any jaw.
- 4) Hereditary (Class III skeletal malocclusion).
- 5) Congenital (Cleft lip and palate).
- 6) Trauma at birth (forcep injury leading to ankylosis of TMJ.)
- 7) Trauma during growth (ankylosis of TMJ and retardation of growth in traumatized bone).

8) Habits such as prolonged thumb sucking and mouth breathing. Because they cause *lowered tongue* position, thus tongue no longer balances the forces exerted by the buccal group of musculature, which leads to narrowing of upper arch leading to posterior crossbite.

Etiology of dental crossbite are :-

- 1) Anomalies in tooth number (supernumerary teeth)
- 2) Anomalies in tooth size macrodontia
- 4) Premature loss of deciduous
- 5) Prolonged retention of deciduous teeth
- 6) Delayed eruption of permanent teeth
- 7) Abnormal eruption path
- 8) Ankylosis

Rarer causes

-  These include cleft lip and palate, where growth in the width of the upper arch is restrained by the scar tissue of the cleft repair. Trauma to, or pathology of, the temporomandibular joints can lead to restriction of growth of the mandible on one side, leading to asymmetry