



TRANSVERSE PROBLEMS

Etiology, Diagnosis and Treatment

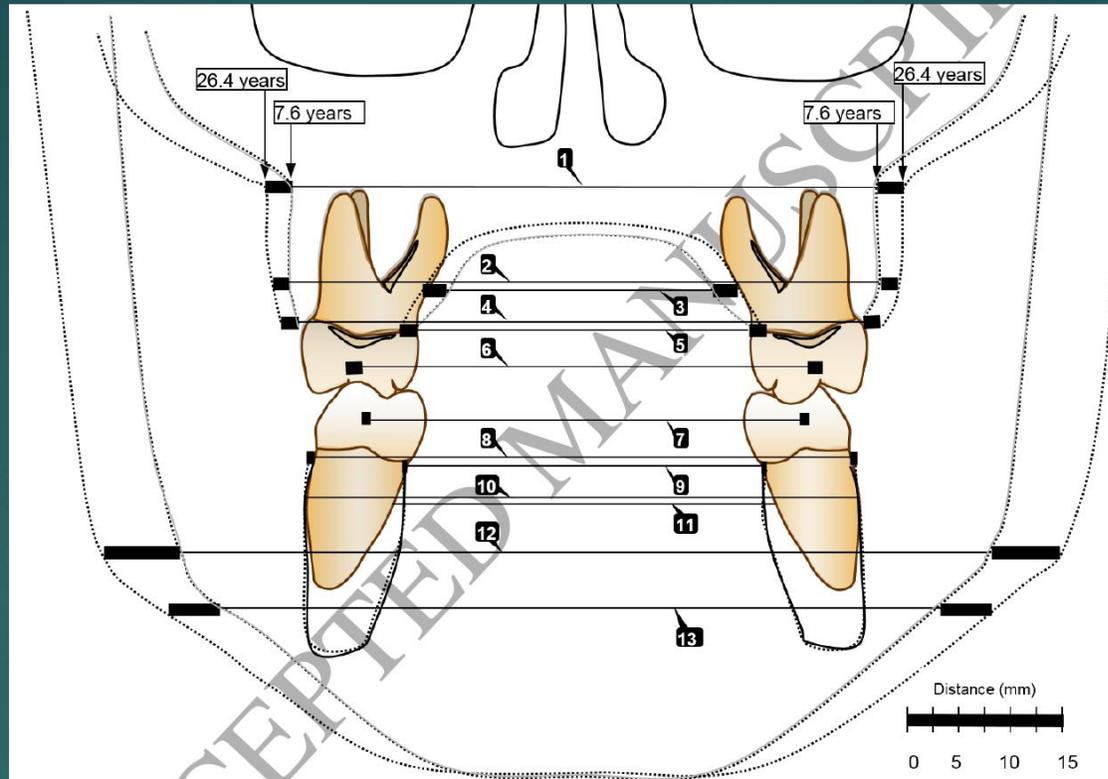
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تکامل عرضی در کمپلکس ماگزیلو مندیبولار

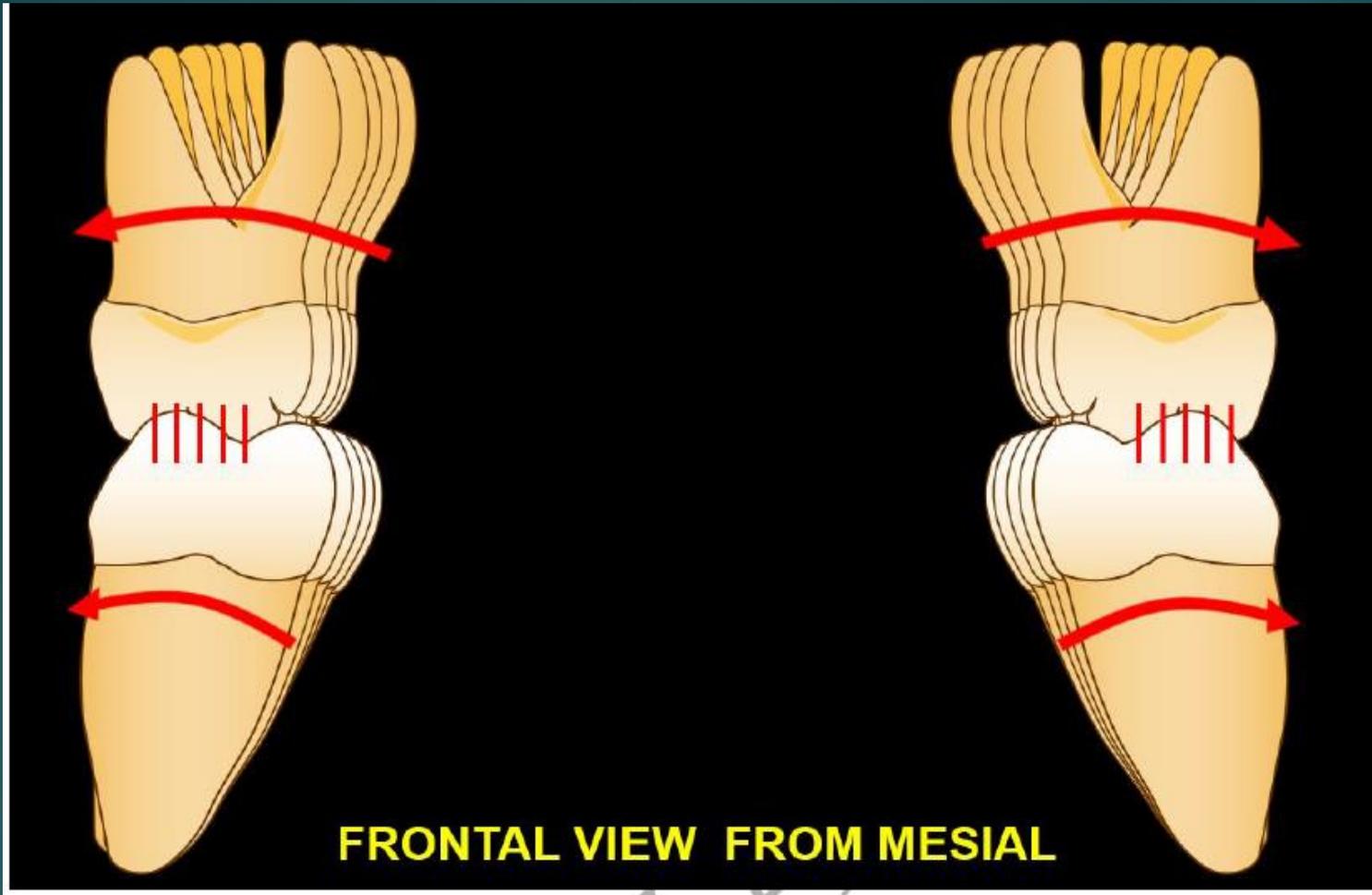
- ▶ دانش ما از تغییرات مورفولوژیکی عرضی که در طول رشد و تکامل رخ می دهد بسیار بیشتر از درک ما از زیست شناسی زیربنایی آن تغییرات است
- ▶ سوال: روند الگوی تغییرات عرضی استخوان که در طول رشد و نمو فک بالا و فک پایین رخ می دهد به چه صورت است؟
- ▶ یک الگوی تغییر عرض استخوانی به عنوان یک گرادیان در بعد عمودی رخ می دهد. همانطور که در شکل 1 نشان داده شده است، بیشترین تغییر پهنا رخ می دهد (نقطه جوگال)، و کمترین تغییر عرض در پایین تر ((نقطه آلوئولی میانی فک پایین) رخ می دهد. تنها دو مورد هستند که ازین الگو پیروی نمی کنند و آنها شامل فاصله بین دو گونیون و فاصله بین دو آنته گونیون می باشد



میزان تغییرات عرضی از سن 7.5 تا 26.5 سالگی به میلیمتر همانطور که مشاهده می شود تغییرات عرضی گرادینانی از بعد عمودی می باشد و از بالا به پایین کم می شود

TRANSVERSE MOVEMENT OF THE MOLARS TEETH

- ▶ دندان‌های آسیاب فک بالا با گشتاور باکالی تاج بیرون می‌آیند و با افزایش سن و با عریض شدن فک بالا به حالت عمودی تغییر حالت می‌دهند.
- ▶ دندان‌های آسیاب فک پایین با گشتاور زبانی تاج بیرون می‌آیند و با افزایش سن به حالت عمودی می‌روند.
- ▶ تغییرات گشتاور با افزایش همزمان اینترمولر فک بالا و فک پایین همراه است
- ▶ به طور متوسط، عرض استخوان بازال فک بالا 5.4 میلی متر افزایش می‌یابد.
- ▶ عرض اینترمولر فک بالا 3.0 میلی متر افزایش می‌یابد. عرض اینترمولر فک پایین 2.0 افزایش می‌یابد
- ▶ میلی متر و عرض آلوئولی سطح تاج قوس متقاطع مندیبل 1.6 میلی متر افزایش می‌یابد



Posterior cross bite

Skeletal

Dental

بعد
از
بلوغ

تا
دوران
بلوغ

تقریبا
در هر
سنی

Surgery (SARPE)

Palatal
expansion

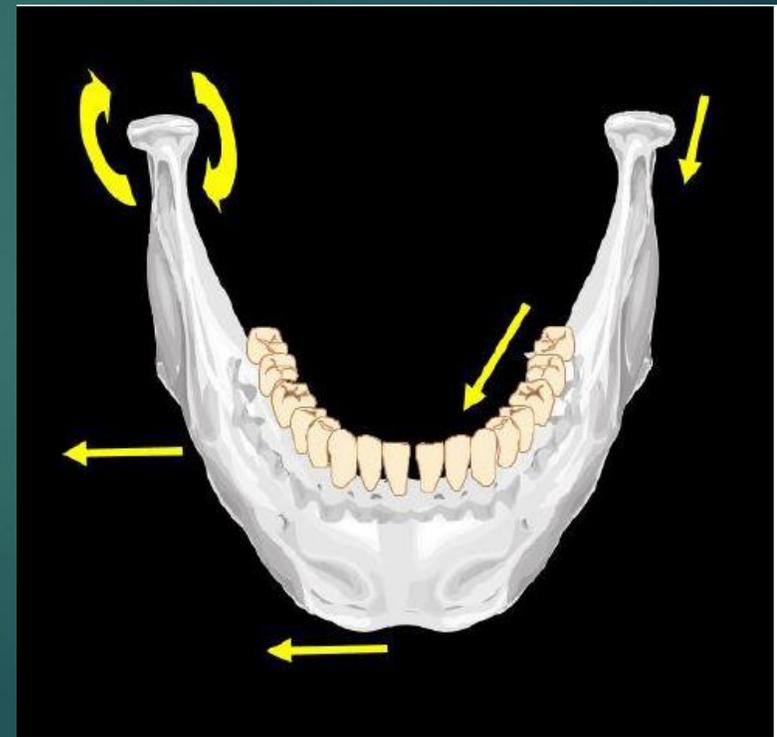
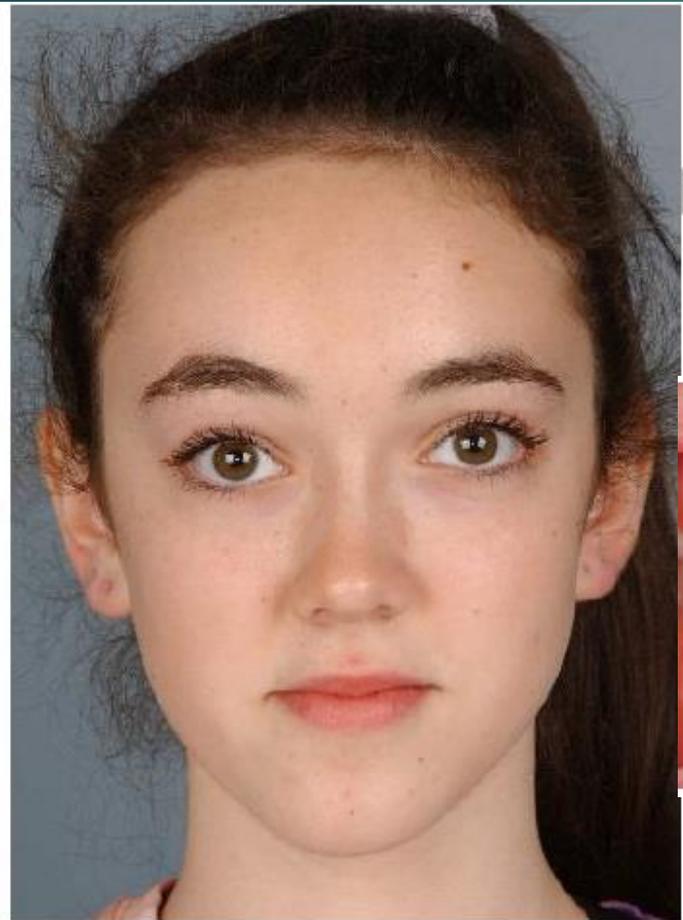
Etiologic factors for adult transverse discrepancies

- ▶ Ectopic tooth eruption.
- ▶ Soft tissue imbalance (example: prolonged digit sucking)
- ▶ prolonged retention of primary teeth

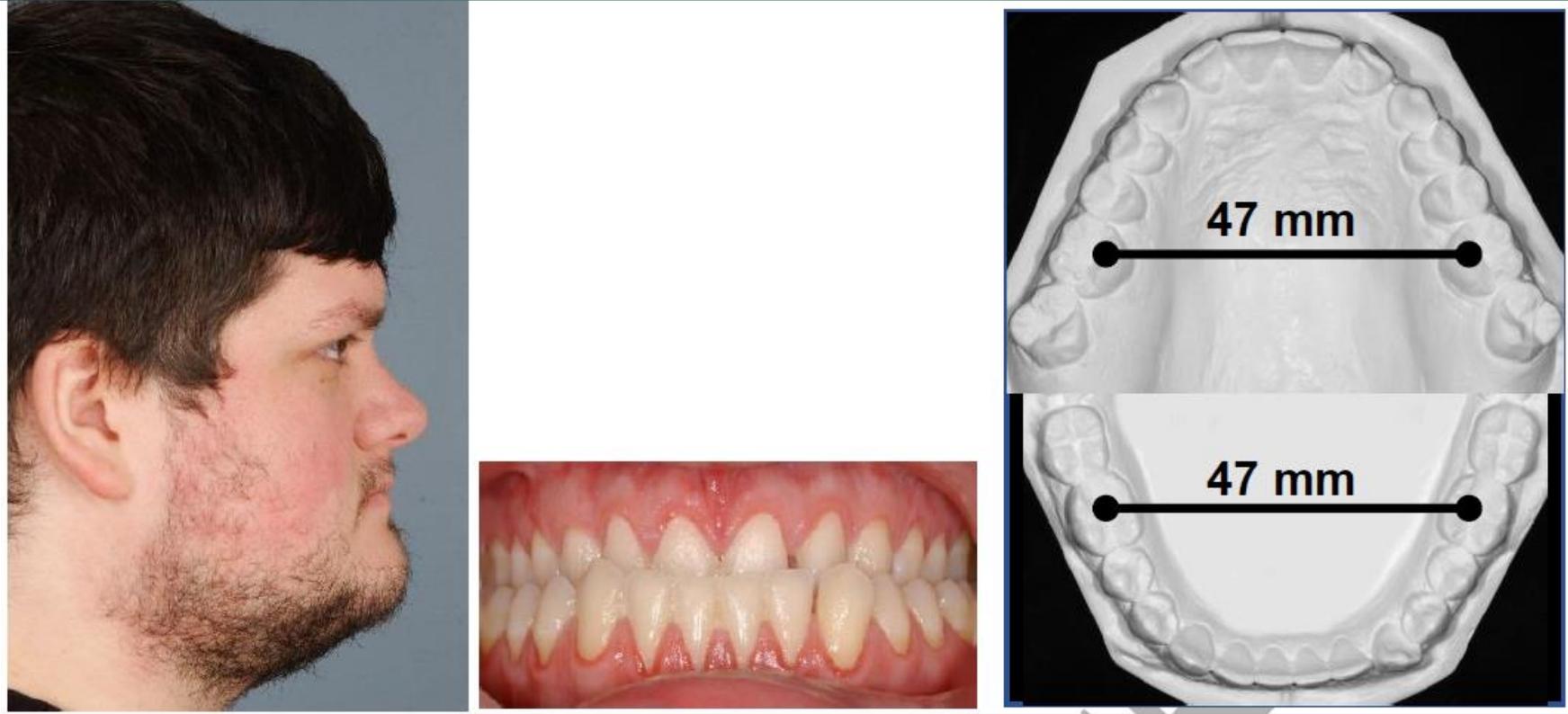
soft tissue imbalance (example: prolonged digit sucking)



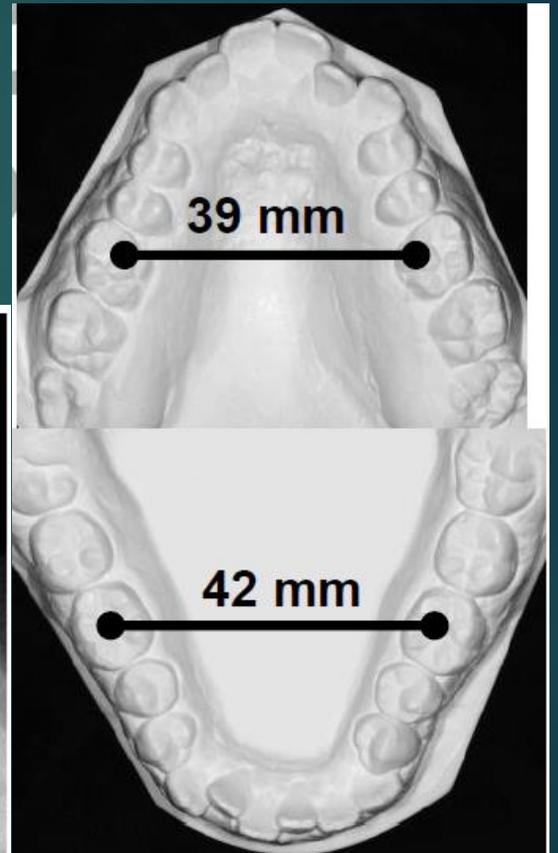
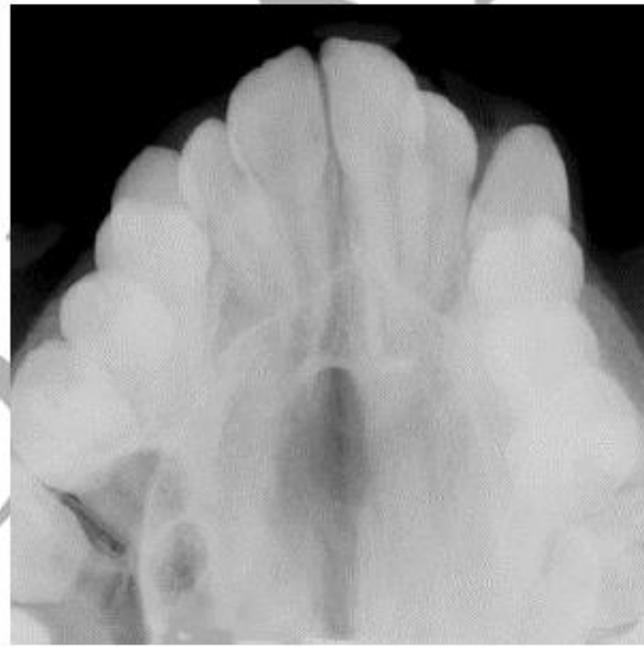
asymmetric mandibular growth



Excess or deficient anteroposterior growth of the maxilla or mandible.



Deficient maxillary transverse growth associated with a palatal cleft

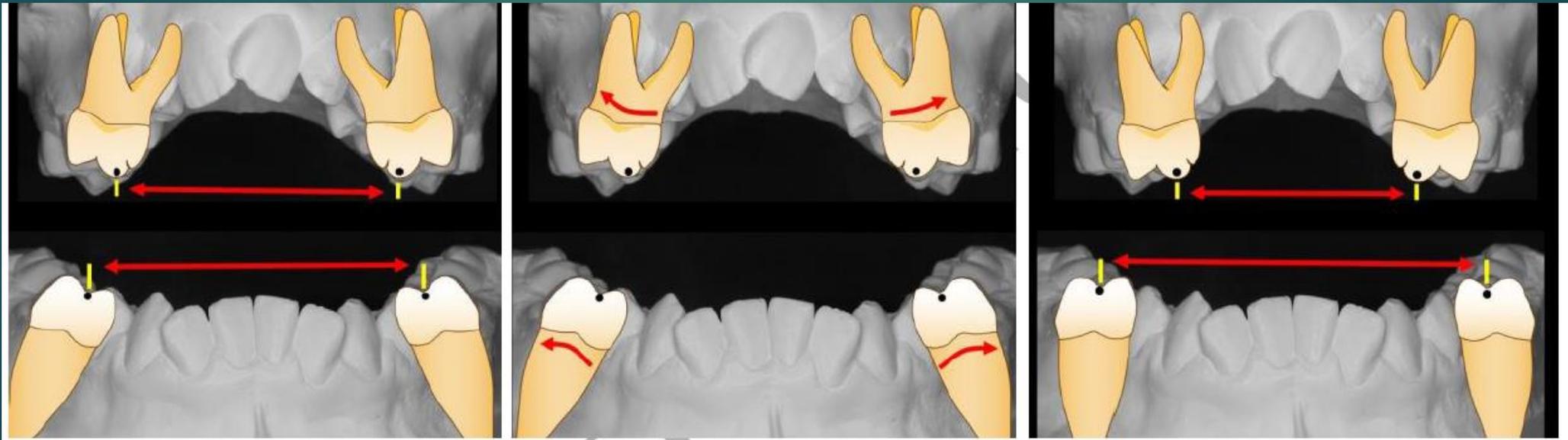


Diagnosis

- ▶ Factors should be considered
 - ▶ *Magnitude of transverse discrepancy*
 - ▶ *Facial symmetry or asymmetry*
 - ▶ *Presence of a lateral CR-CO shift*
 - ▶ *Whether the transverse discrepancy is relative or absolute*
 - ▶ *Magnitude of buccal corridors*

Magnitude of transverse discrepancy

- The **single most important** factor in your transverse treatment planning decision
- The magnitude of the transverse apical base discrepancy will determine the degree to which a posterior cross bite is characterized as **dental or skeletal**



Presence of a lateral CR-CO shift

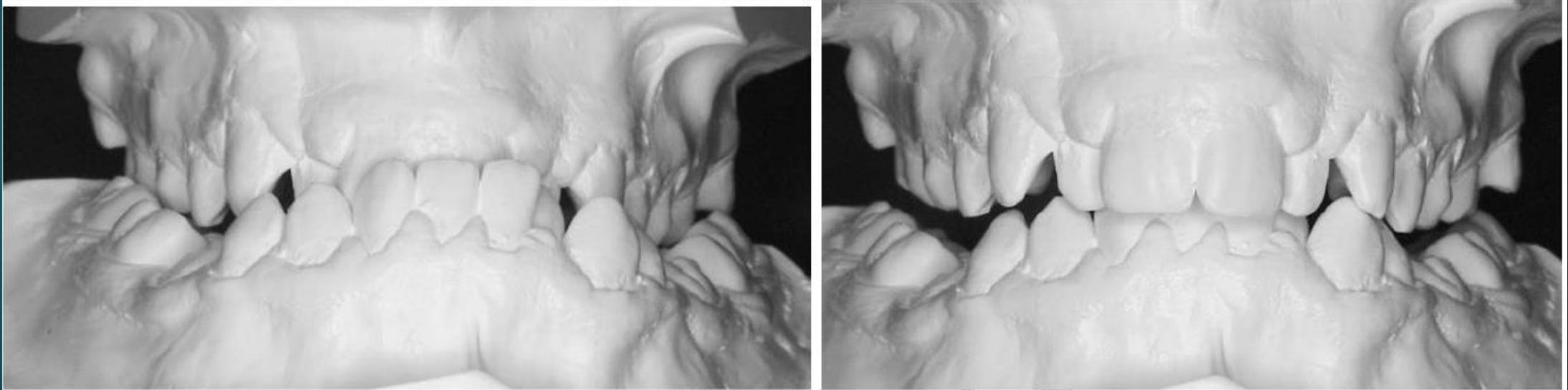
- ▶ *check for a CR-CO shift in every patient at every appointment*
- ▶ A deviation of the chin in the presence of a unilateral cross bite, one should try to establish whether the asymmetry is a result of the shift
- ▶ In addition, check for lateral deviation upon opening

transverse discrepancy *relative or absolute?*

- ▶ A *relative* transverse discrepancy exists when the posterior teeth do not coordinate in centric relation, but do coordinate when the canines of the models are placed in Class I occlusion.



An *absolute* discrepancy exists when the posterior teeth still do not coordinate even when the canines are placed into a Class I relationship.



Magnitude of buccal corridors

- ▶ Usually, a patient with a constricted maxilla and narrow maxillary arch will have large buccal corridors.
- ▶ Conversely, a patient with a wide maxilla, and a broad maxillary arch, will have small buccal corridors



WHEN TREATMENT SHOULD BE DONE?

- ▶ posterior crossbite in a **preadolescent** child falls into **the moderate** category if no other complicating factors (such as severe crowding) are present
- ▶ It should be treated **early** if the child shifts laterally from the initial dental contact position (a centric relation–to–centric occlusion [CR–CO] shift)
- ▶ If there is no shift but space in the arch is borderline, early mixed dentition treatment sometimes is recommended, but usually it is **better to delay until** the late mixed dentition so that more teeth can be guided into position
- ▶ If a skeletal posterior crossbite is treated in adolescence, it will require heavier forces and more complex appliances

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- ▶ The crossbite can be due to a narrow **maxilla** (i.e., to skeletal dimensions) or due only to **lingual tipping** of the maxillary teeth. If the child **shifts** on closure or if the constriction is **severe** enough to significantly reduce the space within the arch, **early** correction is indicated
 - ▶ If not, treatment can be deferred as long as it is corrected before midpalatal suture bridging so lighter forces and simpler, lingual arch–type appliances can be used, especially if other problems suggest that comprehensive orthodontics will be needed later

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- ▶ It is also important to determine whether any associated mandibular asymmetry is the result of a shift of the lower jaw due to **dental interferences** or is due to a **true maxillary or mandibular asymmetry**.
 - ▶ On the average, a 1-mm increase in the **inter-premolar width** increases arch perimeter values **by 0.7 mm**
 - ▶ Total relapse into crossbite is unlikely in the absence of a skeletal problem, and mixed dentition expansion reduces the incidence of posterior crossbite in the permanent dentition, so early correction also simplifies future diagnosis and treatment by eliminating at least that problem from the list

- ▶ Although it is important to determine whether the crossbite is skeletal or dental, in the early mixed dentition years the treatment is usually the same because relatively light forces will move teeth and bones.
- ▶ **An expansion lingual arch is the best choice** at this age; heavy force from a jackscrew device is needed only when the midpalatal suture has become significantly interdigitated during adolescence
- ▶ Heavy force and rapid expansion are not indicated in the **primary or early mixed dentition**. There is a significant risk of **distortion of the nose** if this is done in younger children



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- ▶ 3 basic approaches to the treatment of moderate posterior crossbites in children
 - ▶ *Equilibration to eliminate mandibular shift*
 - ▶ *Expansion of a constricted maxillary arch*
 - ▶ *Unilateral repositioning of teeth*

Equilibration to eliminate mandibular shift

- ▶ **Occlusal interference** caused by the primary **canines** or (less frequently) primary molars
- ▶ Diagnosed by carefully positioning the mandible in centric occlusion
- ▶ The **width of the maxilla** is adequate and that there would be no crossbite without the shift



Expansion of a constricted maxillary arch

- ▶ a lateral shift into crossbite is caused by constriction of the maxillary arch.
- ▶ Even a small constriction creates dental interferences that force the mandible to shift to a new position for maximum intercuspation and moderate expansion of the maxillary dental arch is needed for correction



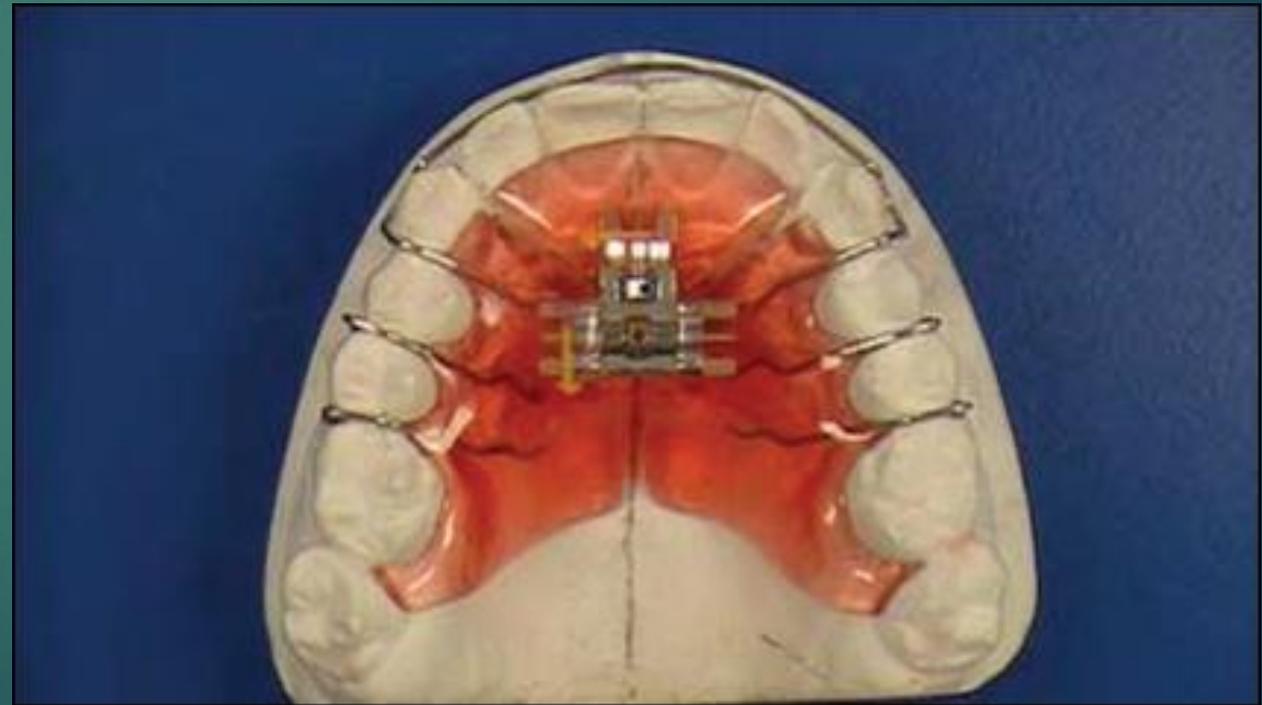
Exception

- ▶ If the permanent first molars are expected to erupt in less **than 6** months, it is **better** to wait for their eruption so that correction can include these teeth, if necessary
- ▶ A greater maxillary constriction may allow the maxillary teeth to fit inside the mandibular teeth—if so, there will not be a shift on closure



split-plate type of removable appliance problems

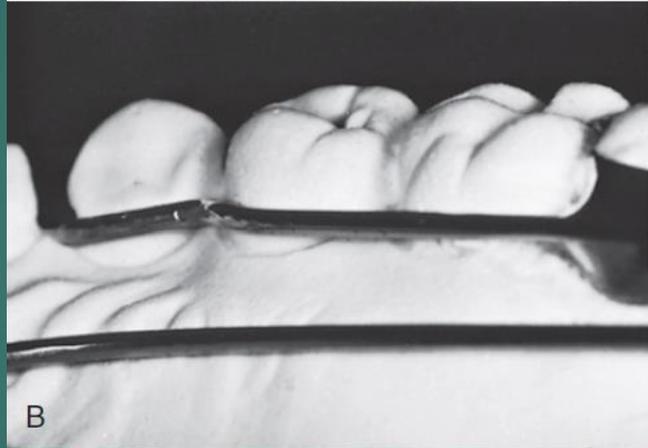
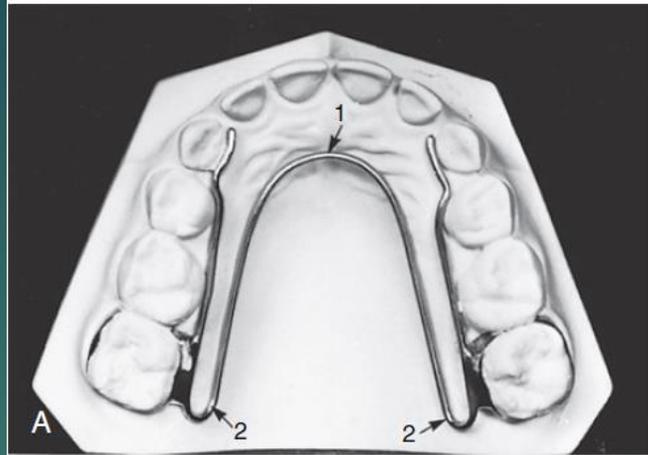
- ▶ patient compliance
- ▶ treatment time is longer
- ▶ more costly than an expansion lingual arch



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- ▶ The preferred appliance for a **preadolescent** child is an **adjustable lingual** arch that requires little patient cooperation
 - ▶ Both the W-arch and the Quad helix are reliable and easy to use.

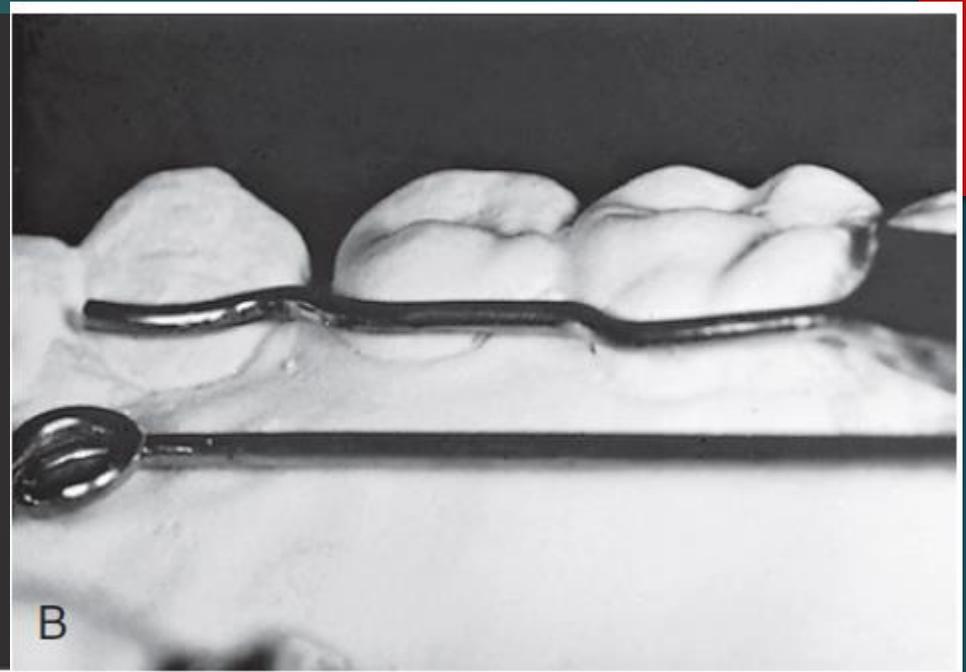
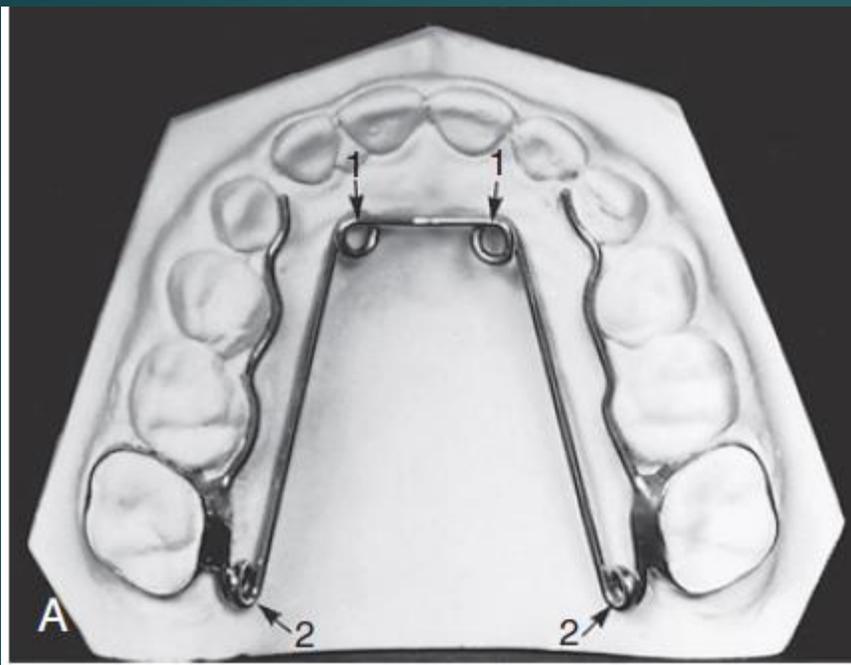
W-arch

- ▶ fixed appliance constructed of 36-mil steel wire soldered to molar bands
- ▶ easily adjusted to provide more anterior than posterior expansion, or vice versa
- ▶ proper force levels when opened 4 to 6 mm wider than the passive width
- ▶ the exception rather than the rule, but acceptable correction and tooth position are almost always achieved.



Quad helix

- ▶ more flexible version of the W-arch
- ▶ 38-mil steel wire
- ▶ The combination of a **posterior crossbite and a finger-sucking habit** is the **best indication** for this appliance.
- ▶ slightly **greater range of action** than the W-arch, but the **forces are equivalent**.
- ▶ Soft tissue irritation can become a problem with the quad helix.
- ▶ Both the W-arch and the quad helix leave an imprint on the tongue
- ▶ The imprint will disappear when the appliance is removed but can take up **to a year** to totally do so
- ▶ The expansion is **not** solely dental in both in mixed dentition



- ▶ Expansion should continue at the rate of 2 mm per month (1 mm on each side) until the crossbite is slightly overcorrected.
- ▶ the lingual cusps of the maxillary teeth should occlude on the lingual inclines of the buccal cusps of the mandibular molars at the end of active treatment
- ▶ Removal and re-cementation are recommended at each active treatment visit



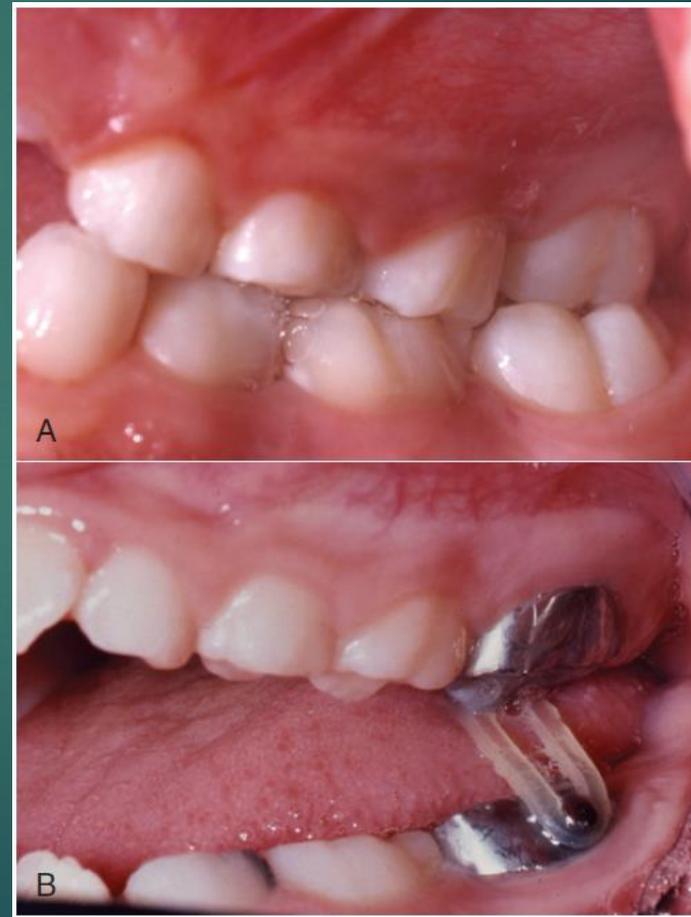
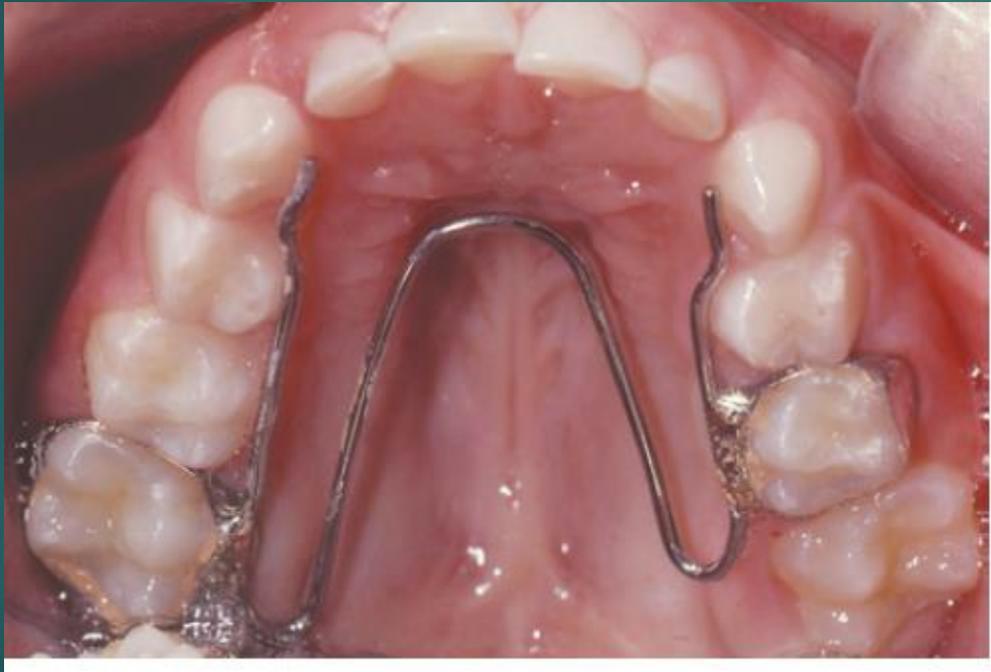
Unilateral repositioning of teeth

- ▶ the ideal treatment is to move selected teeth on the constricted side.
- ▶ The asymmetric movement can be achieved by using different length arms on a W-arch or quad helix



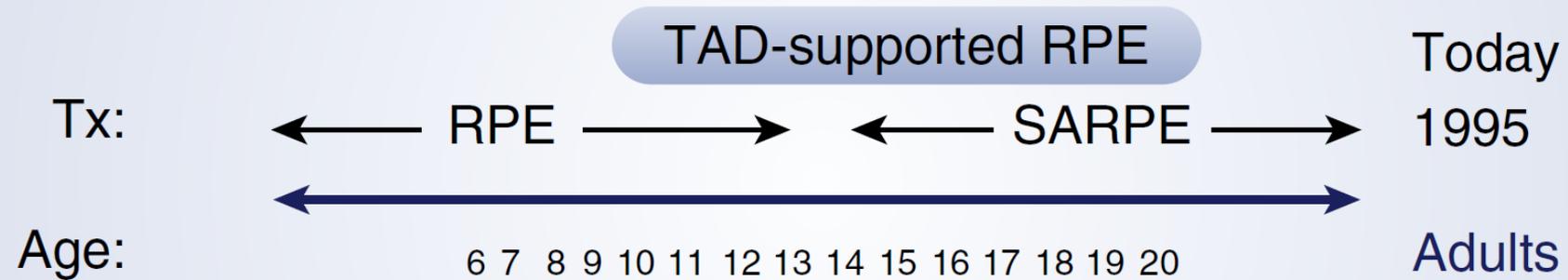
- ▶ An alternative is to use a mandibular lingual arch to stabilize the lower teeth and attach cross-elastics to the maxillary teeth that are at fault.
- ▶ This is more complicated and requires cooperation to be successful but is more unilateral in its effect
- ▶ All the appliances described earlier are aimed at correction of teeth in the maxillary arch, which is usually where the problem is located. If teeth in both arches contribute to the problem, cross-elastics between banded or bonded attachments in both arches (Fig.) can reposition both upper and lower teeth. The best choice is a latex elastic (unless the patient has a latex allergy, which is an indication for polymer elastics) with a 3/16-inch (5-mm) lumen generating 6 ounces (170 gm) of force. The force from the elastics is directed vertically as well as faciolingually, which will extrude the posterior teeth and reduce the overbite. Therefore cross-elastics should be used with caution in children with increased lower face height or limited overbite.

- ▶ Crossbites treated with elastics should be overcorrected, and the bands or bonds left in place immediately after active treatment









Greater potential treatment options



THANK
YOU

