In the name of GOD
Treatment planning of nonskeletal problems in preadolescent children

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Reference:

**Contemporary Orthodontics**

Chapter 7

Treatment planning for moderate problems
Space Problems
Missing primary teeth with adequate space: Space Maintenance

✅ if a primary first or second molar is missing:

more than a 6-month delay before the permanent premolar eruption

adequate space

Space maintenance is needed.
✓ space maintenance can be done with either fixed or removable appliances.

✓ fixed appliances are preferred  ➔  eliminate the factor of patient cooperation

✓ if the space is unilateral  ➔  unilateral fixed appliance
✓ if molars on both sides have been lost and

Lateral incisors have erupted

Better to place a lingual arch
Early loss of a single primary canine:

- space maintenance
- or
- extraction of the contralateral tooth to eliminate midline shift

arch length shortens as the incisor teeth drift distally and lingually

lingual arch space maintainer
Localized space loss (3mm or less) : Space Regaining

✓ potential space problems can be created by drift of permanent incisors or molars after premature extraction of primary canines or molars.

✓ in children who meet the criteria for moderate problems (no skeletal or dentofacial involvement), lost space can be regained by repositioning the teeth that have drifted.

✓ after the space discrepancy has been reduced to zero, a space maintainer is necessary.
Space regaining is most likely to be needed when primary maxillary or mandibular second molars have been lost prematurely because of decay or ectopic eruption of the permanent first molar (less frequently).

permanent first molar usually migrates mesially quite rapidly, and in extreme case may totally close the space.
✓ in a **single quadrant**, up to **3 mm** of space may be regained by tipping the molar back distally.

✓ if space loss is **bilateral**, the limit of space regaining is **5-6 mm** for the **total arch**.
✓ space regaining may be indicated after early loss of one mandibular primary canine.

✓ asymmetric activation of a lower lingual arch is one approach.

✓ loss of primary canine usually occurs because of root resorption caused by erupting lateral incisors without enough space.

✓ it is important to be aware of the overall space deficiency: should not exceed 4 mm
Generalized moderate crowding

- generalized arch length discrepancy of 2-4 mm and no prematurely missing primary teeth → moderately crowded incisors

- unless the incisors are severely protrusive, the long-term plan → generalize expansion of the arch to align the teeth

- the major advantage of doing this in the mixed dentition → esthetic

- the benefit is largely for the parents, not the child
✓ in the mandibular arch ➔ adjustable lingual arch

✓ in the maxilla ➔ either a removable or fixed appliance

✓ rotated incisors usually will **not** correct spontaneously even if space is provided, so early correction would require bonded attachments for these teeth.
Other Tooth Displacements
Spaced and flared maxillary incisors

- spaced and flared maxillary incisors
- class I molar relationship
- good facial proportions
- excessive space available
- narrowing of the maxillary arch (usually)

Prolonged thumb sucking
Physiologic adaptation to the space between the anterior teeth, requires that the tongue be placed in this area to seal off the gap for successful swallowing and speech.

This is not the cause of the protrusion or open bite and should not be the focus of therapy.

If the teeth are retracted, the tongue thrust will disappear.
➢ the habit should be eliminated before attempting to retract the incisors.

➢ if the flared upper incisors have no contact with the lower incisors, a removable appliance can retract the protruding incisors quite satisfactorily.

➢ if there is a deep overbite anteriorly, protruding incisors can not be retracted until it is corrected.
➢ the lower incisors biting against the lingual of the upper incisors prevents the upper teeth from being moved lingually.

➢ even if anteroposterior jaw relationships are class I, a skeletal vertical problem may be present  ➔  complex treatment
Maxillary midline diastema

- **small spaces are normal** before eruption of maxillary canines.

- in the **absence** of deep overbite, these spaces normally **close spontaneously**.

- for spaces **greater** than 2 mm, spontaneous closure is **unlikely**.

- **persistent** spacing correlates with a **cleft** in the alveolar process between the central incisors into which fibers from the maxillary **labial frenum** insert.
➢ for larger diastema surgically removal of the frenal attachment may be necessary to obtain a stable closure of the midline diastema.

➢ the best approach is to do nothing until the permanent canines erupt.

➢ if the diastema does not close spontaneously, an appliance can be used to move the teeth together, and a frenectomy should be considered.

➢ early frenectomy should be avoided.
Posterior crossbite

- in mixed dentition children usually result from narrowing of the maxillary arch

- often observed in children who have had prolonged sucking habits

- if the child shifts on closure or the constriction is severe enough to significantly reduce space within the arch, early correction is indicated.

- if not, especially if other problems suggest that comprehensive orthodontics will be needed later, treatment can be deferred until adolescence.
➢ both **removable** and **fixed** appliances can be effective.

➢ the maxillary arch should be **slightly overexpanded**

➢ **overexpanded position should be held passively for approximately 3 months** before the appliance is removed.
Anterior crossbite

- is rarely found in children who do not have a skeletal class III jaw relationship

- the maxillary lateral incisors tend to erupt to the lingual and may be trapped in that location, especially if there is not enough space

- extraction the adjacent primary canine prior to complete eruption of the lateral incisor usually leads to spontaneous correction
lingually positioned incisors limit lateral jaw movements and they or their mandibular counterparts sometimes suffer significant incisal abrasion, so early correction indicated.

it is important to evaluate the space situation before treatment.

if there is enough space in the arch, it is necessary to remove the maxillary primary canines prematurely.

if enough space is available, a maxillary removable appliance to tip the upper incisors facially is usually the best mechanism.
Anterior open bite

- **simple** anterior open bite: limited to the anterior region with **good facial** proportions

- **the major cause**: prolonged thumb sucking

- **the most important** step: stop sucking habits

- **behavior modification** techniques are appropriate
➢ when the **habit stops**, the open bite gradually closes **without** any treatment

➢ if an intra-oral appliance is needed, the **preferred** method is a **maxillary lingual arch with an anterior crib device**

➢ it is important to present such a device to the child as an **aid**, not as a **punishment**
➢ in about half of the children:
  thumb sucking stops immediately
  anterior open bite closes relatively rapidly

➢ in the remaining children:
  thumb sucking persists for a few weeks

➢ the crib is eventually effective in 85% to 90% of patients.

➢ leave the crib in place for 6 months after the habit has apparently been eliminated.
Over-retained primary teeth and ectopic eruption

➢ general guideline ➔ a permanent tooth should erupt when 3/4 of root completed

➢ primary tooth retained too long ➔ delayed permanent tooth eruption

➢ most likely when the permanent tooth bud is slightly displaced

➢ treatment ➔ remove the primary tooth
➢ in some children the pace of resorption of the primary teeth is slow, for whatever reason almost all the primary teeth have to be removed timely.

➢ if a primary tooth is removed quite prematurely relatively dense bone and soft tissue layer form over the unerupted permanent tooth usually delays but does not prevent the eruption.
➢ if the eruption of a permanent tooth delayed until its root formation is complete

should be given a chance to erupt on its own

may be necessary to place an attachment on it and gently pull it into the arch
Ectopic eruption of permanent molars and canines

➢ the most common site is the maxillary molar region
  the second primary molar blocks the first permanent molar
  suffers root resorption

➢ it should be repositioned

➢ if all else fails, the primary molar extracted ➞ rapid space loss

need for: space regaining or

premolar extraction
- ectopic eruption of maxillary canine is relatively frequent
- it can permanently damage the root of lateral incisor
- the abnormal eruption path may leave the unerupted canine in a lingual position nearer the midline than normal
- it is much easier to prevent this problem than to correct it later
➢ extract the maxillary primary canines when radiographs disclose that the permanent canines are overlapping the permanent lateral incisor roots.

➢ the more the overlap, the less the chance of eventual normal eruption
Planning comprehensive orthodontic treatment
1- Separation of *pathologic* from developmental (orthodontic) problems
2- **Prioritization** of the items on the orthodontic problem list, so that the most important problem receives highest priority for treatment.
3- Consideration of **possible solutions** to each problem, with each problem evaluated for the moment as if it were the only problem the patient had.
Skeletal antero-posterior problem → Growth modification

Before

Surgery

Camouflage

After
4- Evaluation of the interactions among possible solutions to the individual problems
5- Development of alternative treatment approaches, with consideration of benefits to the patient vs. risks, costs, and complexity
6- Determination of a final treatment concept, with input from the patient and parent
7- Selection of the specific therapeutic approach (appliance design, mechanotherapy) to be used
Thanks for your attention