



ПОЛТАВСЬКИЙ  
ДЕРЖАВНИЙ МЕДИЧНИЙ  
УНІВЕРСИТЕТ

**Department of Orthodontics**

**Ukraine NOW**

ua

**4 course**

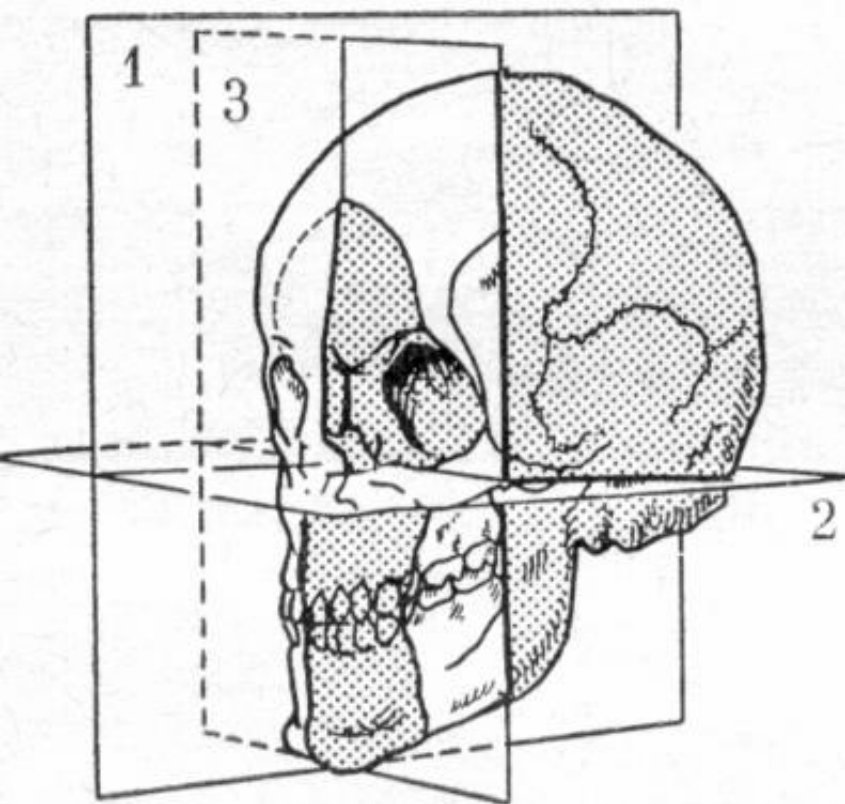
**Transversal malocclusions. Etiology,  
pathogenesis, prophylaxis, clinical  
presentation and diagnostics**

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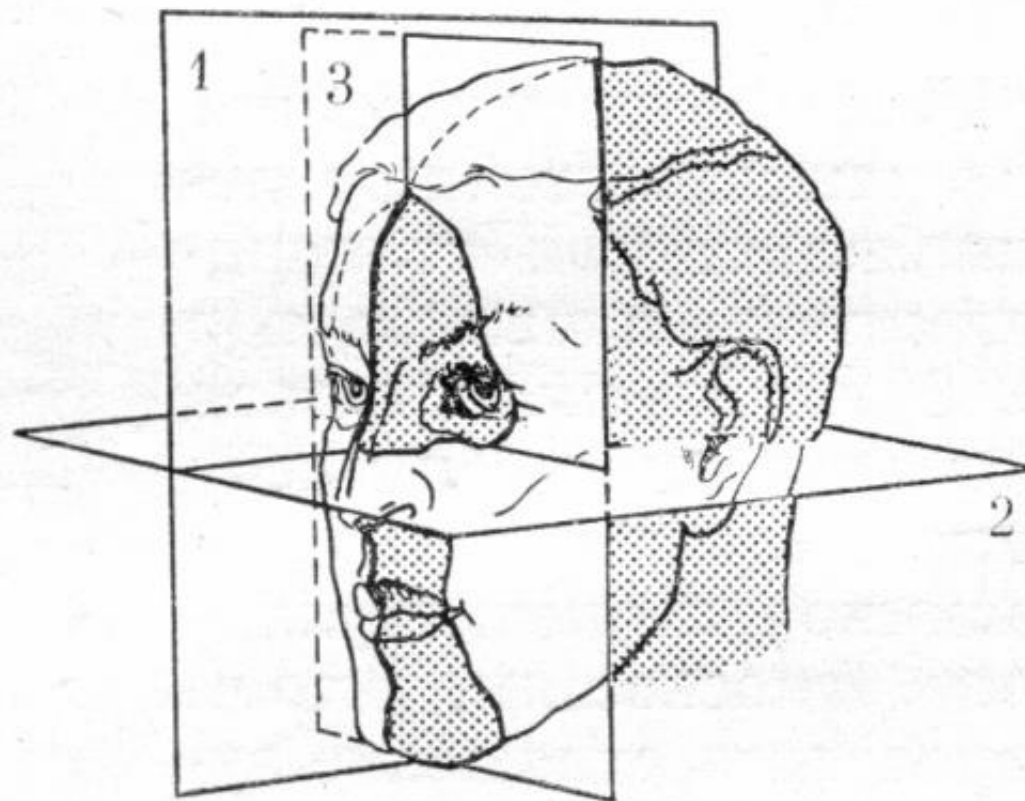
**Poltava 2024**

# Plan of lecture

- Etiology
  - Pathogenesis
  - Clinic
  - Diagnostics
  - Treatment
  - Prophylaxis
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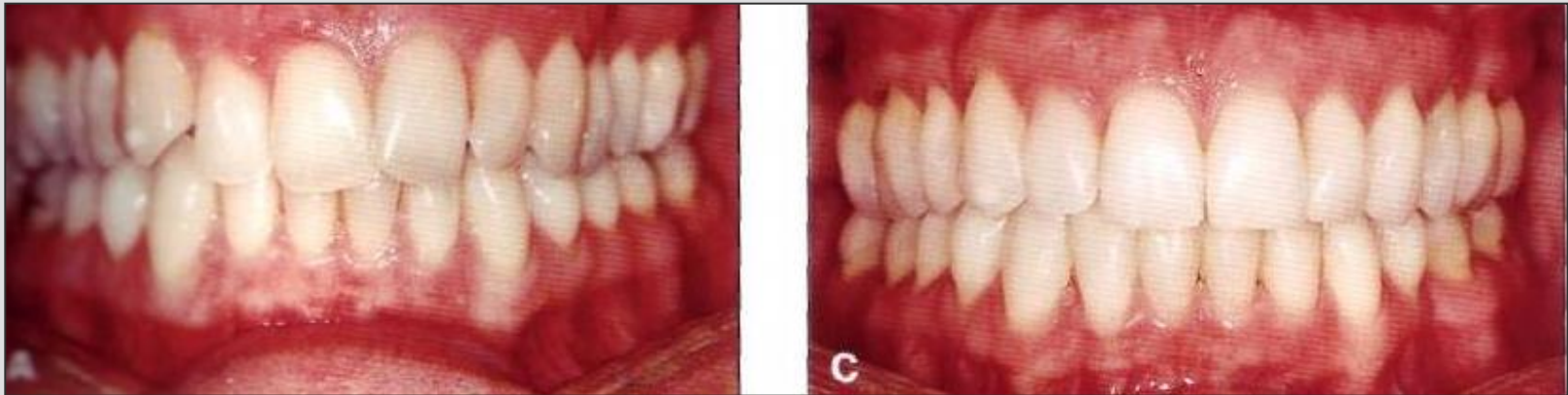


A



Б

## Describing of the bite in transversal plane:



# CROSS BITE

- Anomaly of bite, that is characterized by anomaly of covering in posterior part of dental arches.





**The cross bite** a transverse discrepancy in arch relationship in which the palatal cusps of one or more of the upper posterior teeth do not occlude in the central fossae of the opposing lower teeth .



# Location:

a) anterior



b) posterior

- unilateral

- bilateral



## **In different classifications:**

### **Angle:**

I class – buccal position of upper or lower teeth or lingual position of upper or lower teeth

### **Batelman:**

Two types of cross bite:

The first variant - on one side teeth articulate like while orthognathia, and on other side lower teeth overbite upper ones.

The second variant - on one side lower lateral teeth excessively overbite upper ones, and on other side - upper lateral teeth excessively overbite lower ones, that is closes down not with masticatory cusps, but with lateral surfaces. The variant with hypofunction of one of muscles, that moving a lower jaw to forward

### **Kalvelis:**

Two types of cross bite:

The first variant - narrowed dentition

The second variant - upper and lower dentition width inconformity

- a) lateral teeth from both sides correlation disorder (bilateral cross bite);
- b) lateral teeth from one side correlation disorder (skewed or single cross bite).

### **WHO:**

Lateral teeth cross bite.

Lateral teeth lingvoocclusion.

### **Grigoryeva:**

Cross bite in the frontal area

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Laterognathic

Laterogenic



## Classification of the cross bite:

### **By Uzhumetskene**

#### ***The 1st form — buccal cross bite.***

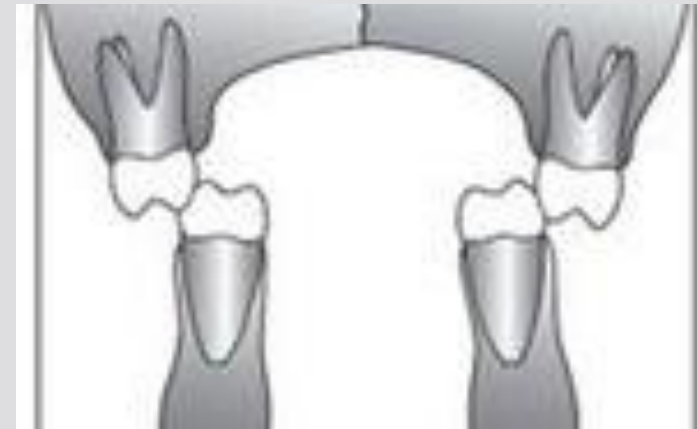
1. *Without lateral lower jaw displacement:*
  - a) unilateral, conditioned by unilateral narrowing of the upper dental arch or jaw, dilation of the lower dental arch or jaw, these signs combination;
    - b) bilateral,
2. *With lateral jaw displacement:*
  - a) parallel to the median-sagittal plane;
    - b) diagonally.
3. *Combined buccal cross bite* — combination of the 1st and 2nd varieties signs.



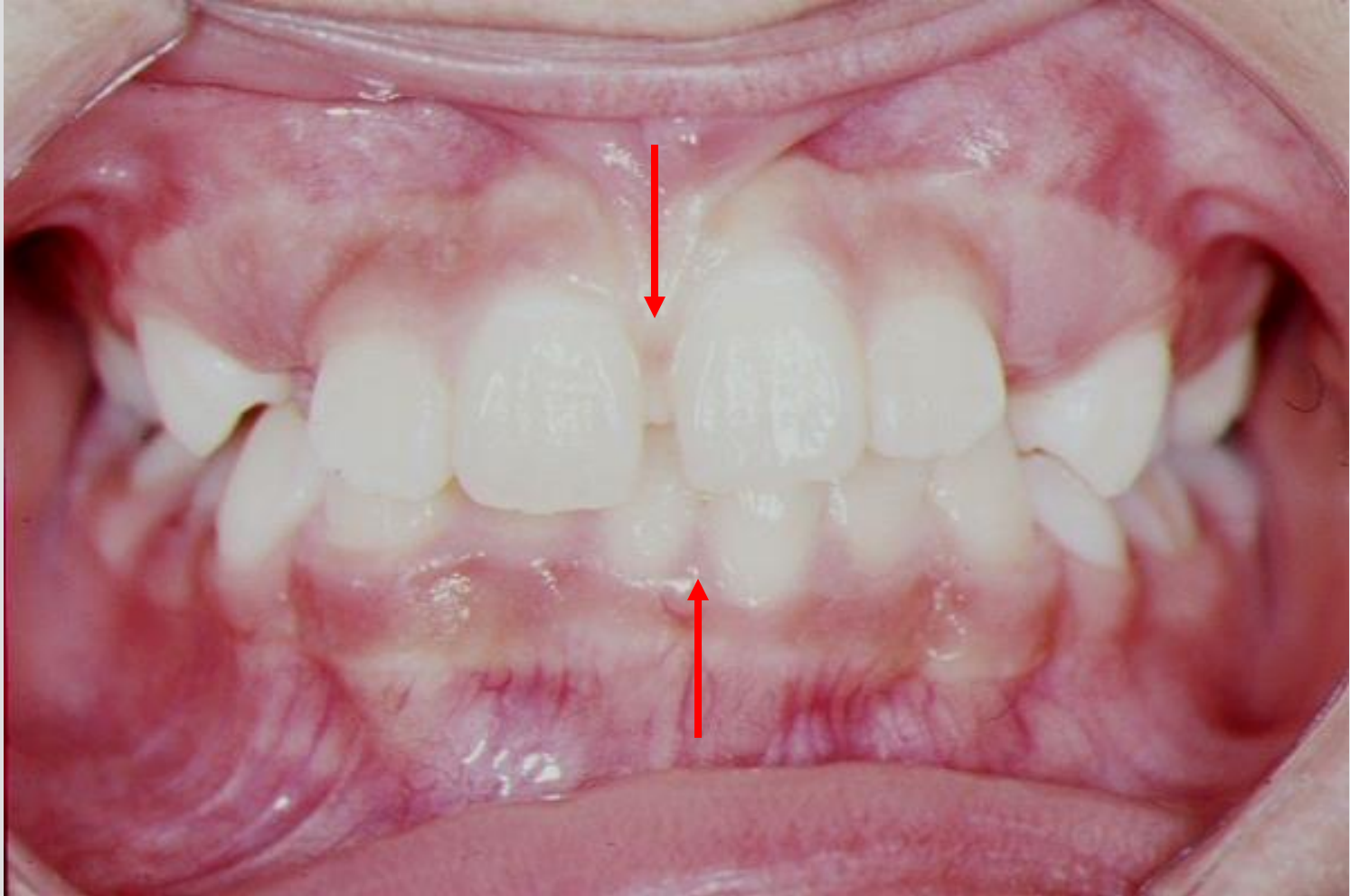
# Classification of the cross bite:

by Uzhumetskene

- *The 2nd form - lingual cross bite.*
  1. *Unilateral*, conditioned by the unilaterally widening of upper dental arch, the unilaterally narrowed lower jaw, or combination of these disorders.
  2. *Bilateral*, conditioned by the wide upper dental arch or jaw, narrowed lower jaw, or these signs combination.
- *The 3rd form — combined (buccal-lingual) cross bite.*



# DENTAL MIDLINES



## Classification of the cross bite:

Three types of cross bite:

1. Dentoalveolar - narrowing or widening of dentoalveolar arch of one jaw;
  2. Gnathic - narrowing or widening of the jaw base;
  3. Jointly - moving of lower jaw to one side.
-

# **Etiology of the cross bite**

Hereditary (Class III skeletal malocclusion).

**Diego Velazquez**



**Philip IV, 1655, Madrid**



**Karl II, son of Philip IV**

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# Cross bite forming beginning in early age





# **Etiology of the cross bite**



**Position during sleeping  
with hand under cheek**



## **Etiology of the cross bite**



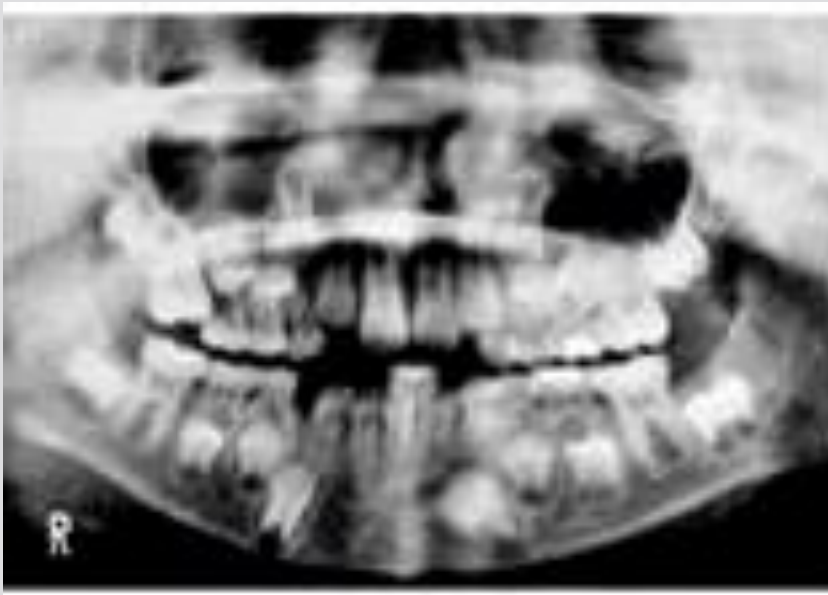
## **Result of a bad habit**



## Etiology of the cross bite



## Atypical teeth position



# Etiology of the cross bite

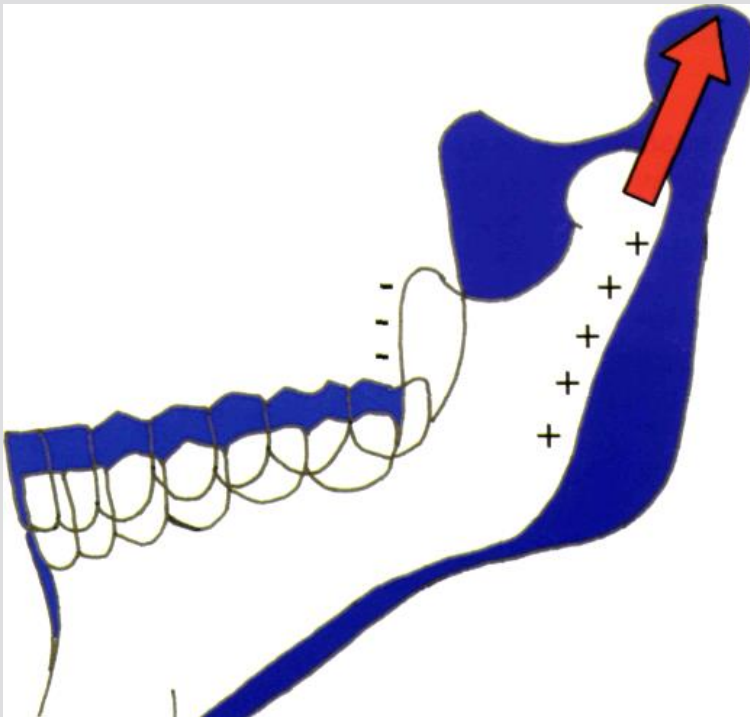
**Atypical teeth eruption' term**





## Etiology of the cross bite

- Unilateral condylar hypoplasia or hyperplasia
- Juvenile rheumatoid arthritis



## **Etiology of the cross bite**

**Untimely, uneven abrasion of the temporary teeth or its absence**

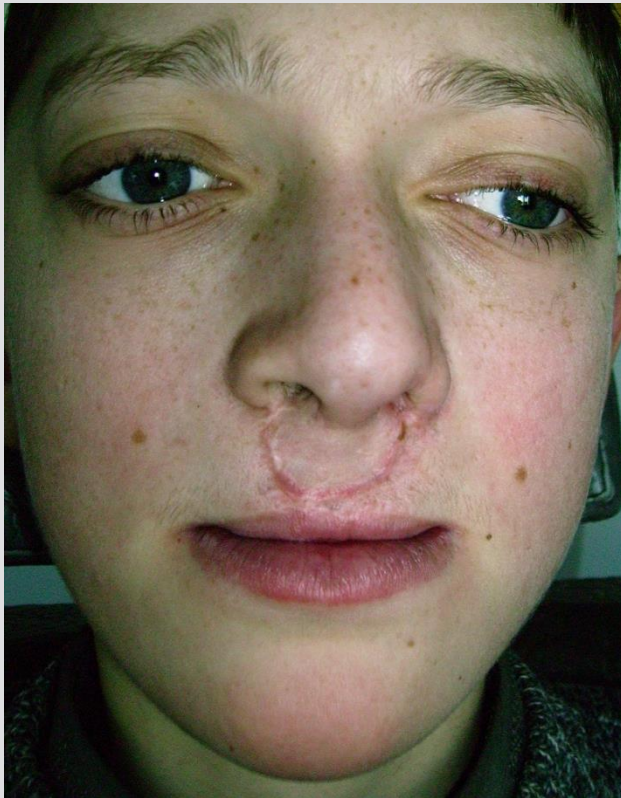




# Etiology of the cross bite

## Condition after uranoplasty

Congenital ( Cleft lip and palate).



# Etiology of the cross bite

## Early extraction of teeth



# Etiology of the cross bite

**Oral breathing**

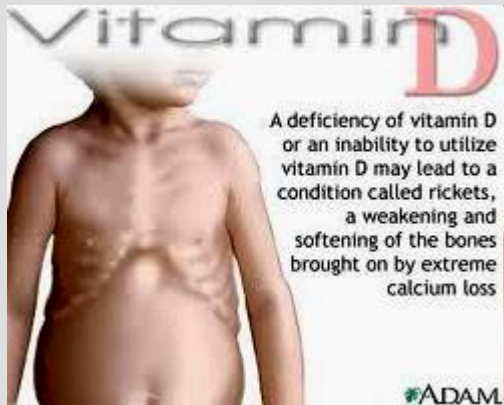


**Infantile swallowing**



# Etiology of the cross bite

## Diseases of childhood (rachitic)





# Etiology of the cross bite

## Ankylosis



Trauma during growth



Trauma at birth (forcep injury leading to ankylosis of TMJ.)

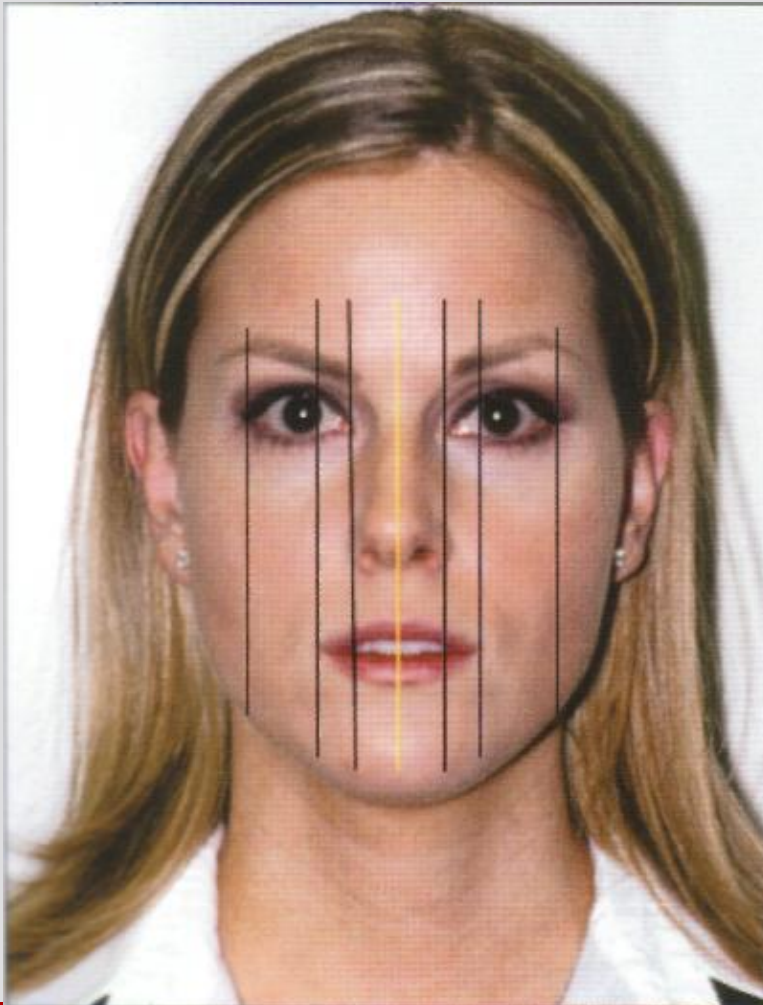
Trauma during growth

Trauma after completion of growth

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# Diagnostic of the cross bite

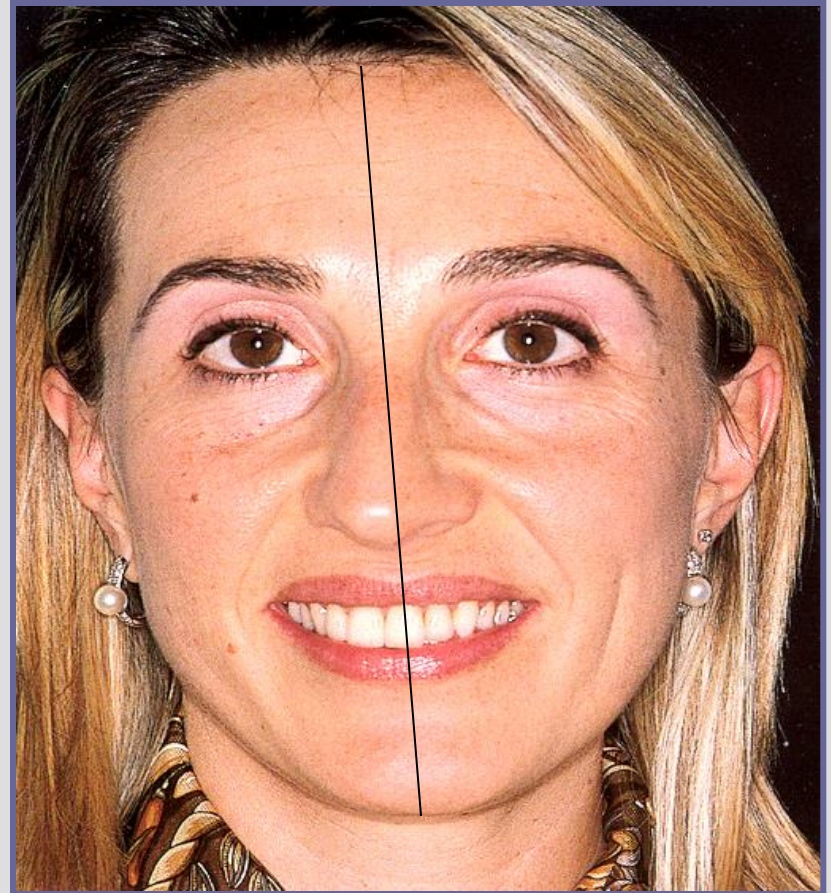
## Photometric method



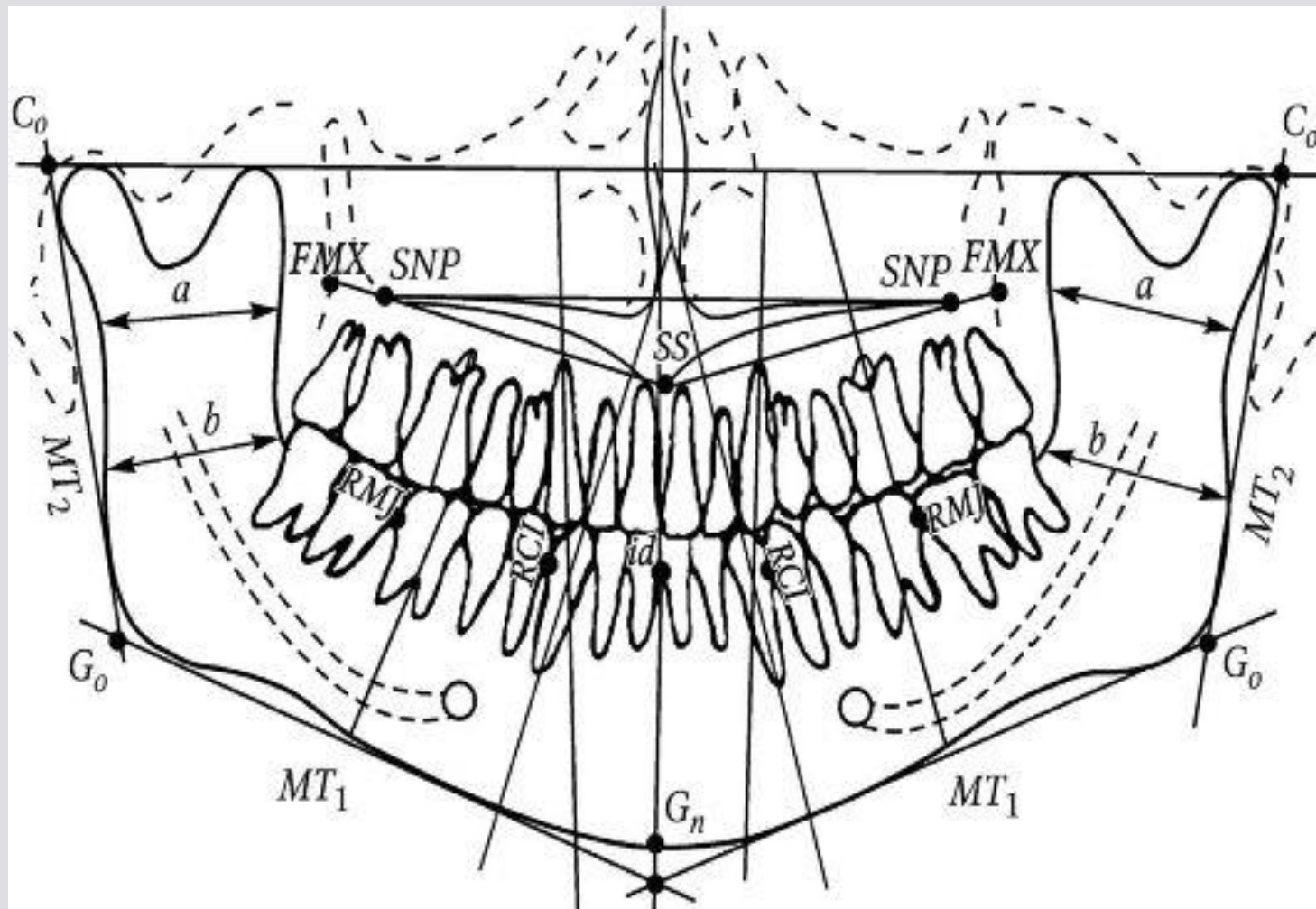


# Asymmetry

A reduction of proportion between the left and right sides of the face.



# Diagnostic of the cross bite

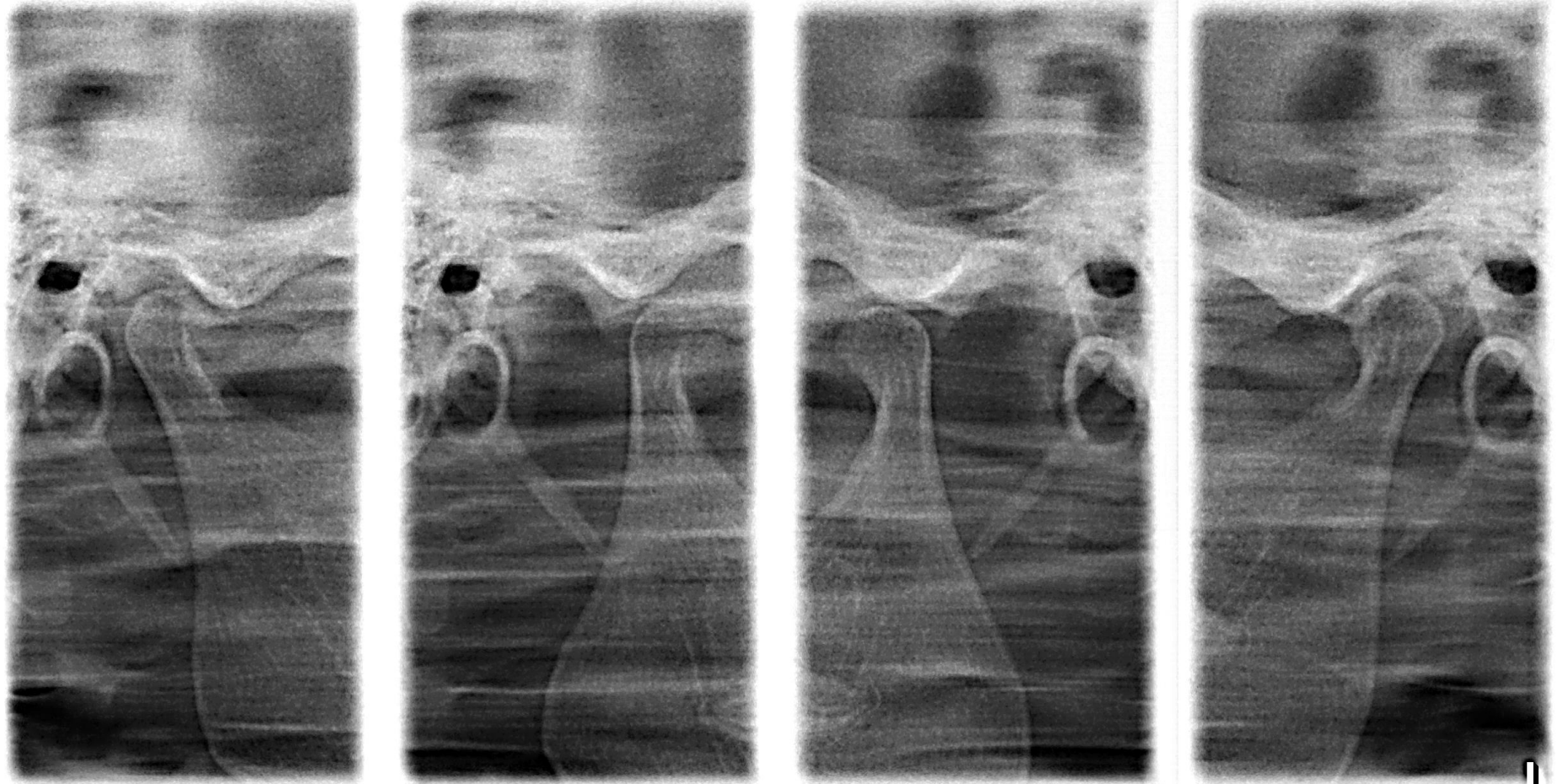




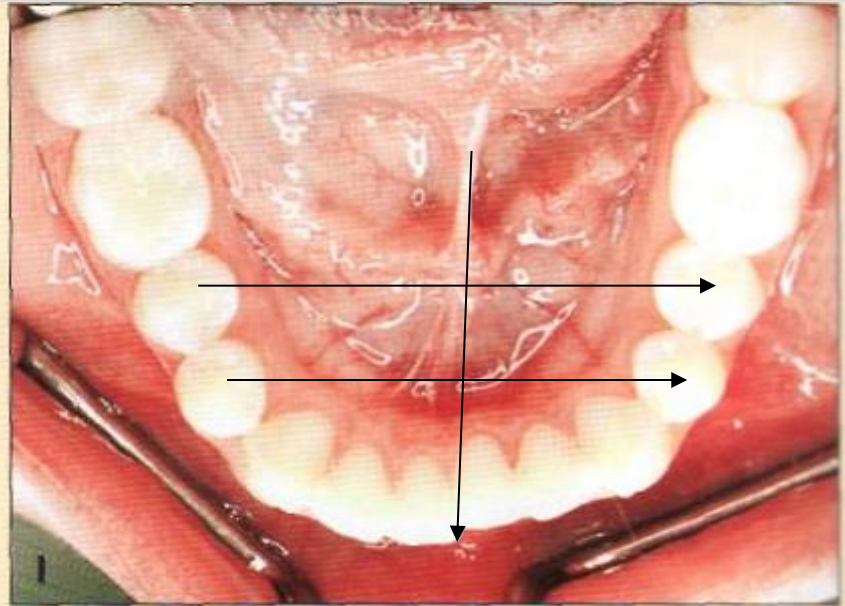
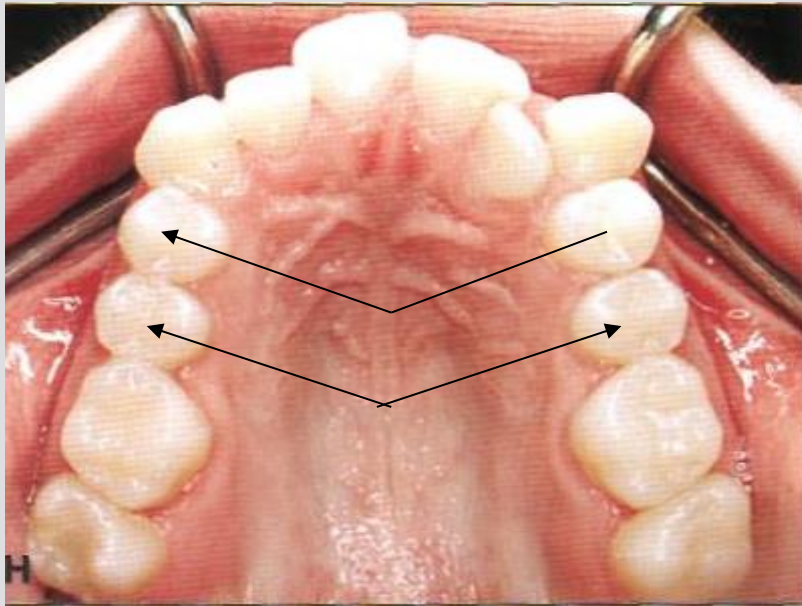
## Diagnostic of the cross bite



## Diagnostic of the cross bite

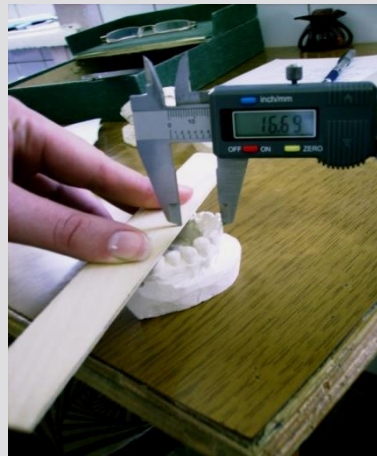


# Diagnostic of the cross bite





# Morfometric method

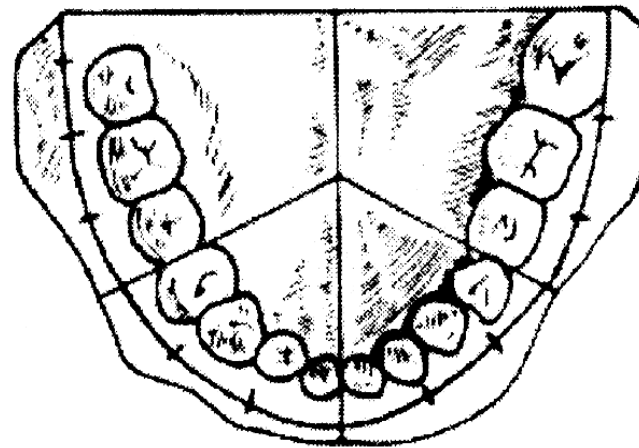
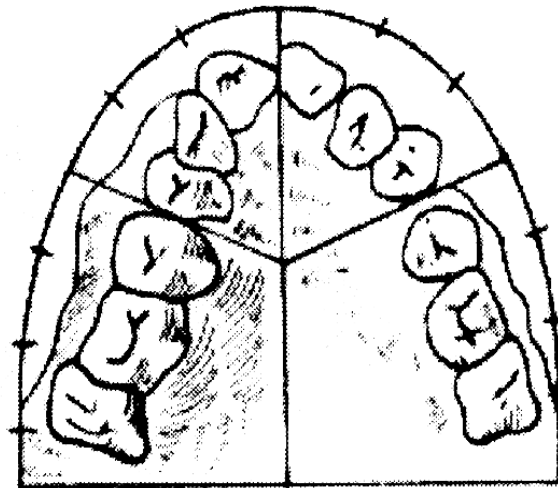
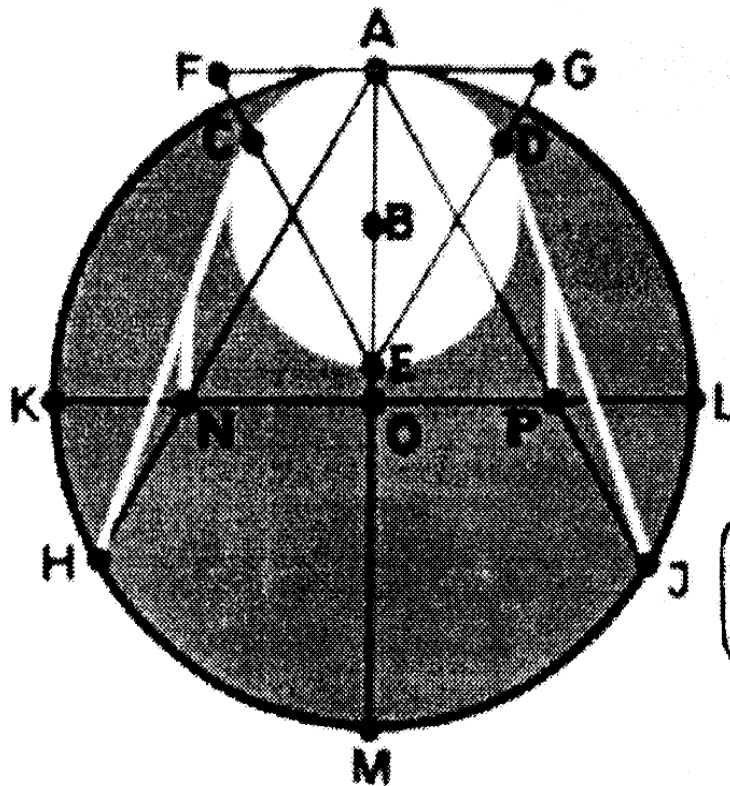




# Morfometric method



# Graphic method



# Diagnostic of the cross bite

## Clinical functional test of breathing (test with cotton)





# Diagnostic of the cross bite

## Clinical functional test of swallowing (test with a sip of water)



# Clinical functional tests by L.V. Illina-Markosyan

***At the first test*** (study in a state of rest) we examine the face of patient in front and profile, paying attention to position of lower jaw at rest, during a talk. We expose the facial signs of anomaly of a bite.

***At the second test*** (study of usual occlusions it is offered to the patient to close teeth, without opening lips. In cases of usual displacement of lower jaw the facial signs of deformation become more expressed according to direction of displacement a jaw. Mesial or distal displacement of jaw is determined by a form of face, profile lateral – by the front form.

***At the third test*** (study of lateral displacements of lower jaw) it is offered to the patient to widely open the mouth and thus we determine displacement of lower jaw aside. At its lateral displacement asymmetry of face increases, diminishes or disappears depending on its cause. We determine the correlation of middle line of face and dental rows.

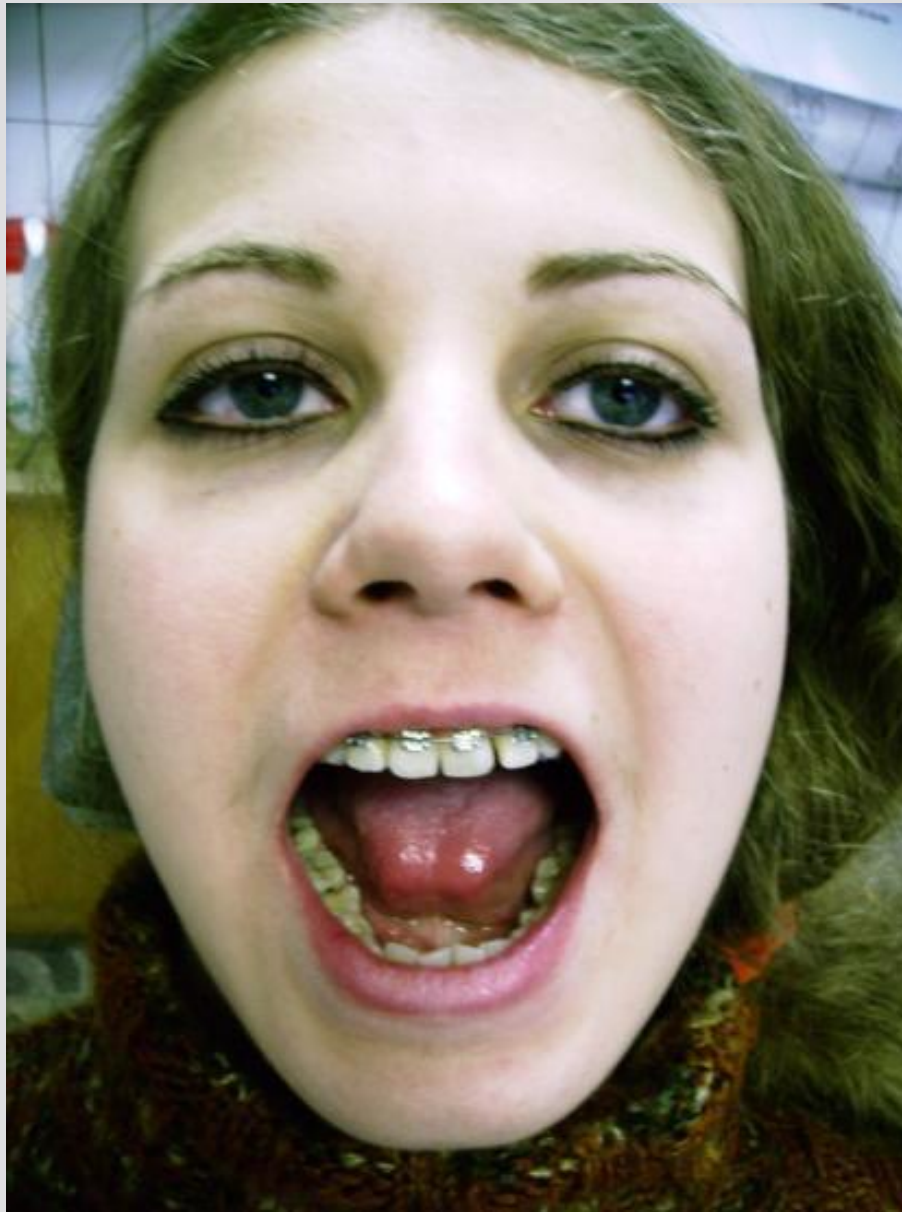
***At a fourth test*** (comparative study of usual and central occlusion) we estimate harmony of face after establishment of lower jaw in correct position (without its usual displacement) and compare them from the aesthetic point of view with harmony of face at establishment of lower jaw in usual occlusion (with displacement of lower jaw).

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## **Aesthetic disorders:**

**1. Without aesthetic disorders if patient has not lower jaw displacement.**

**2. With aesthetic disorders:**

**a) Asymmetry of the face;**

**b) Chin displacement;**

**c) smoothed nose-lip and lip-chin folds;**

**d) increasing of lower jaw angles;**







## Morphological disorders:

**Incorrect teeth relationship in a transversal plane;**



# MANAGEMENT

In normally growing mandible, posterior cross bites should be treated as early as possible to allow the normal growth and development of the dental arches and the TMJ.

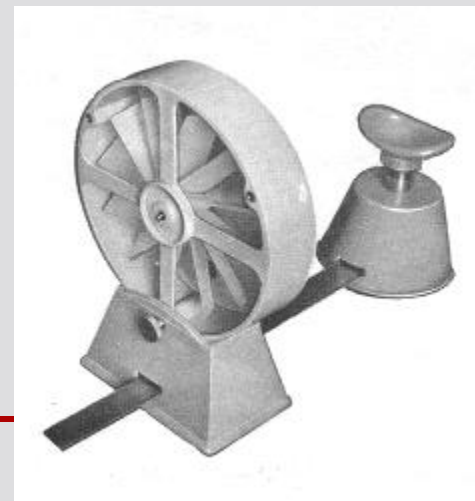
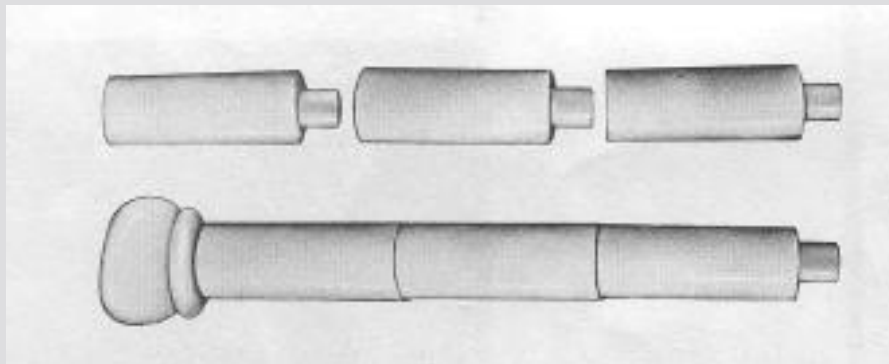
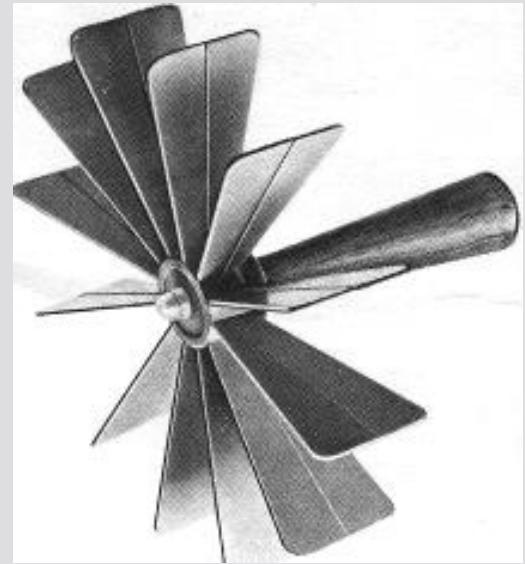
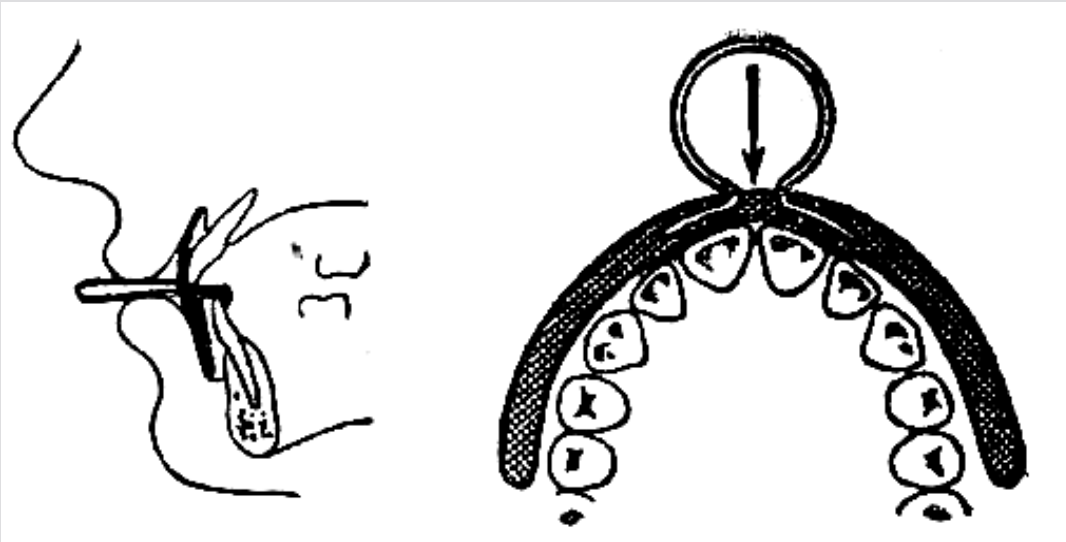
And in areas where mandibular shift is present it should be managed as soon as possible to prevent soft tissue and dental compensation

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## Principles of the cross bite treatment

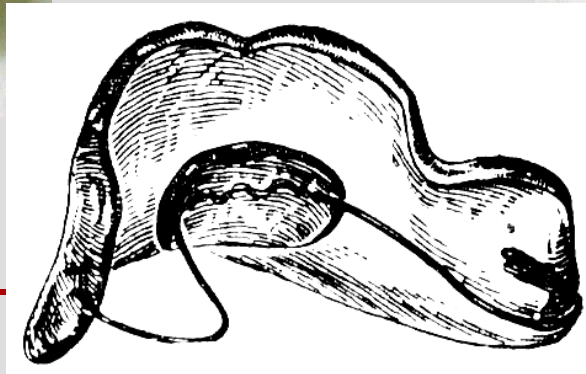
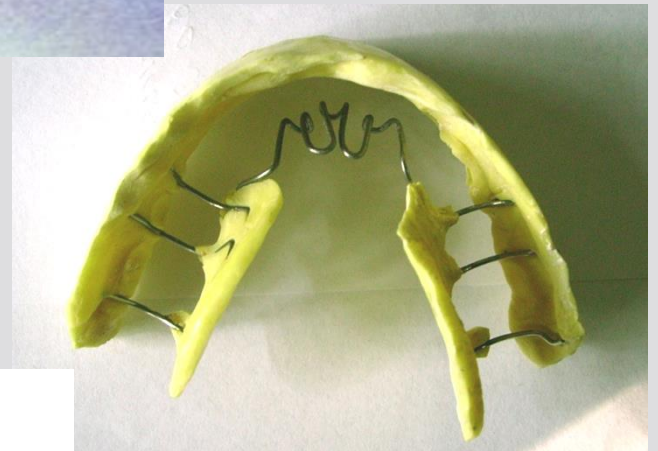
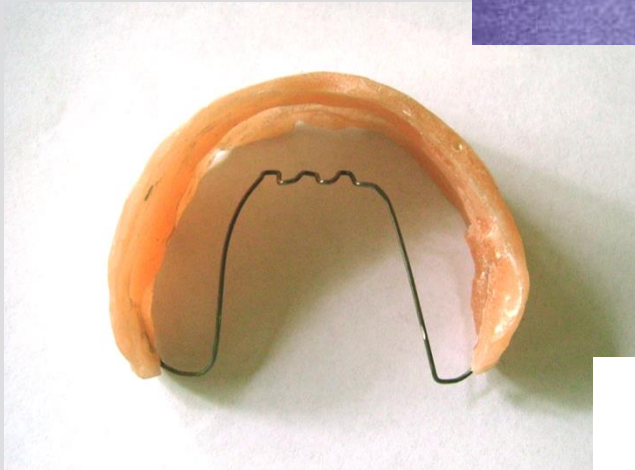
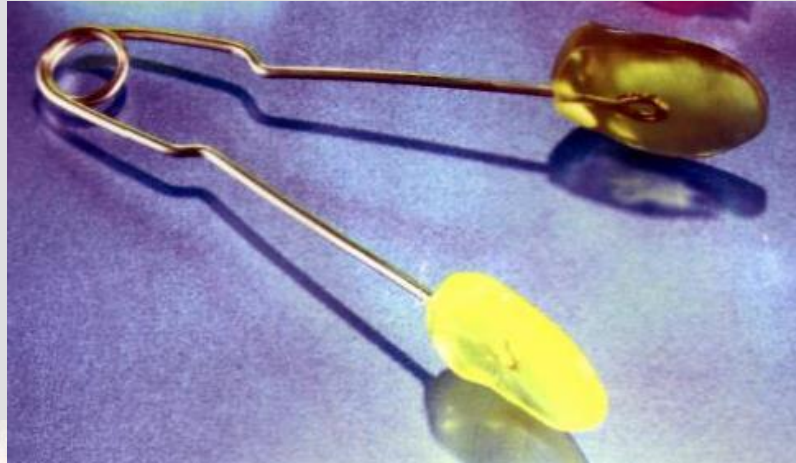
- Etiological factors removing.
  - Restructuring of oral cavity muscles acting
  - Normalizing of lower jaw position.
  - Dental arches shape restructuring.
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## During temporal dentition





## During temporal dentition









Teeth  
abrasion





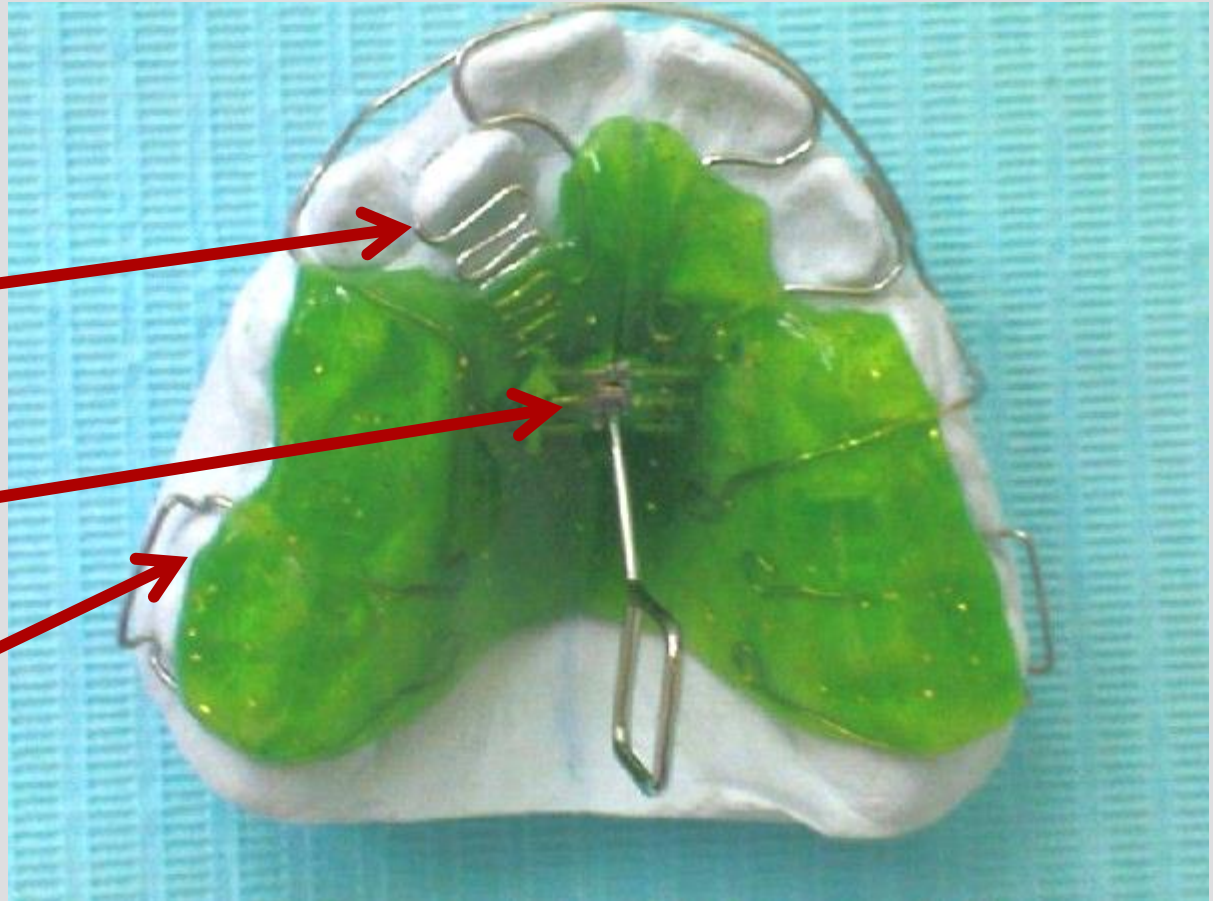
# Removable appliances

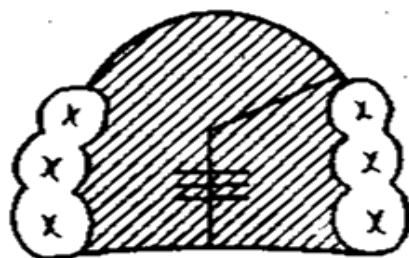
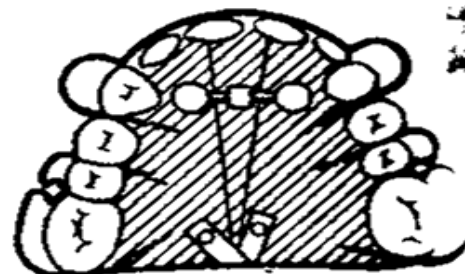
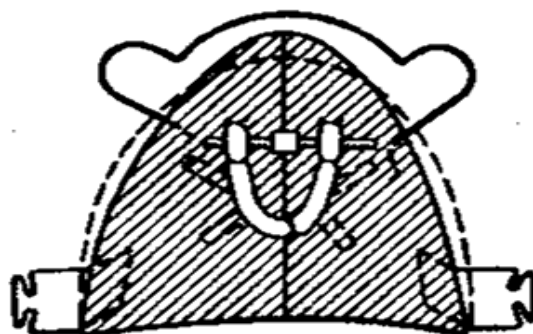
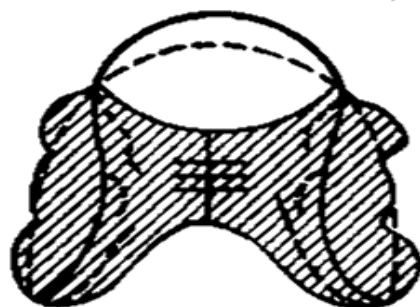
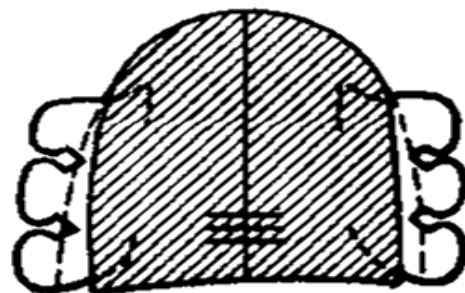
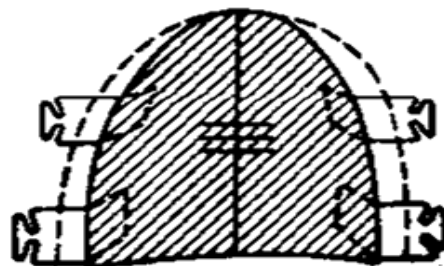
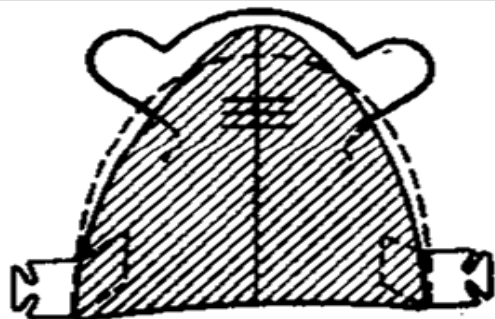
## Z-spring

Repositioning of individual teeth within the arch.

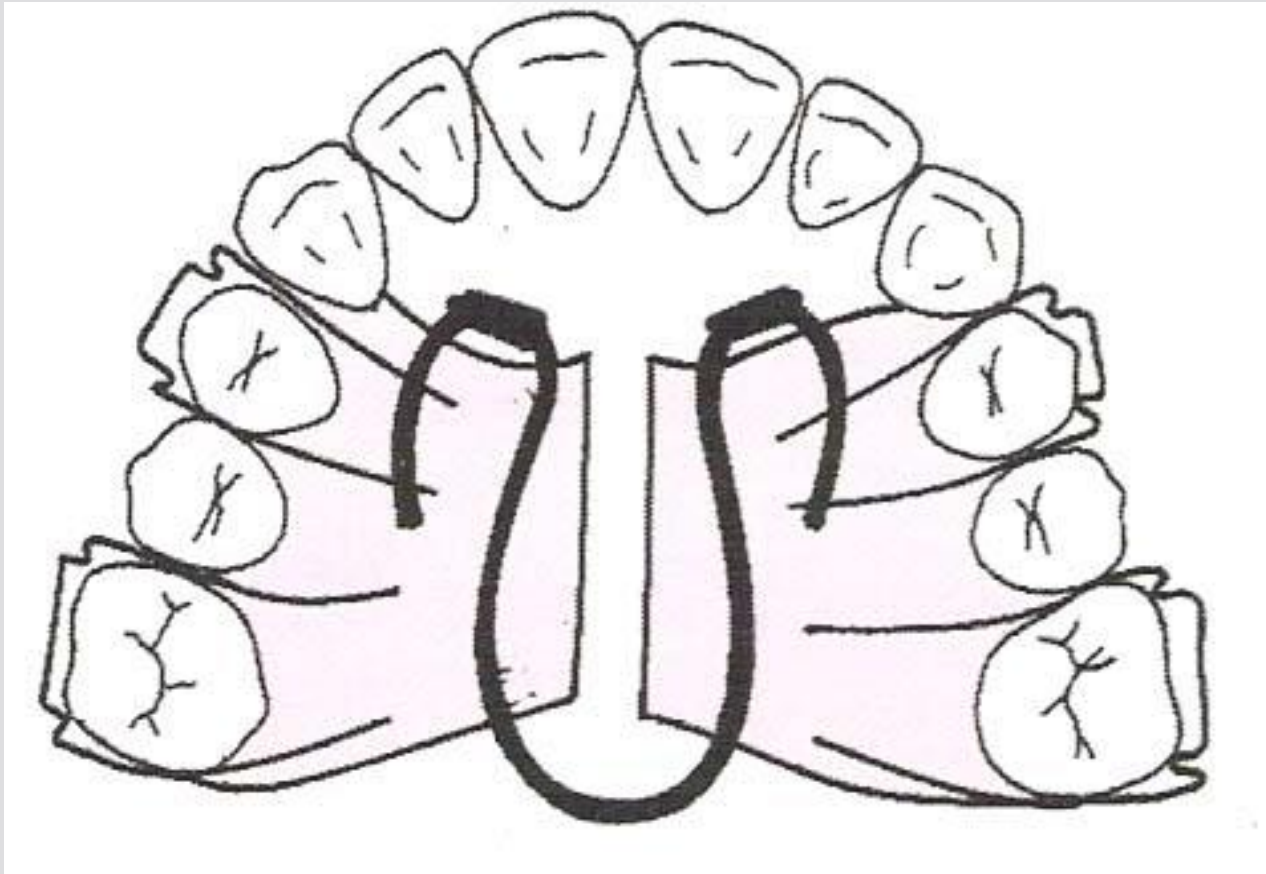
Mid-line screw  
for arch expansion

Posterior bite plane  
to disocclude teeth



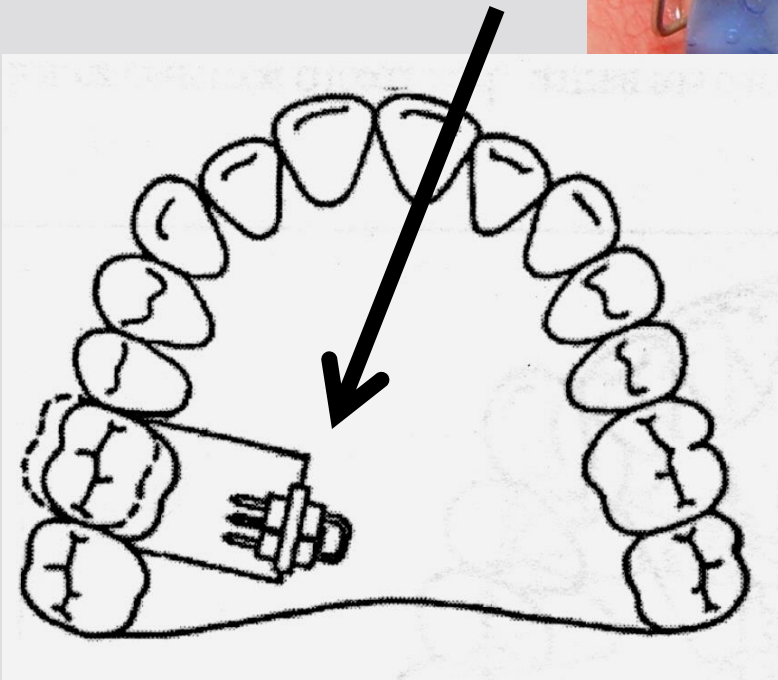
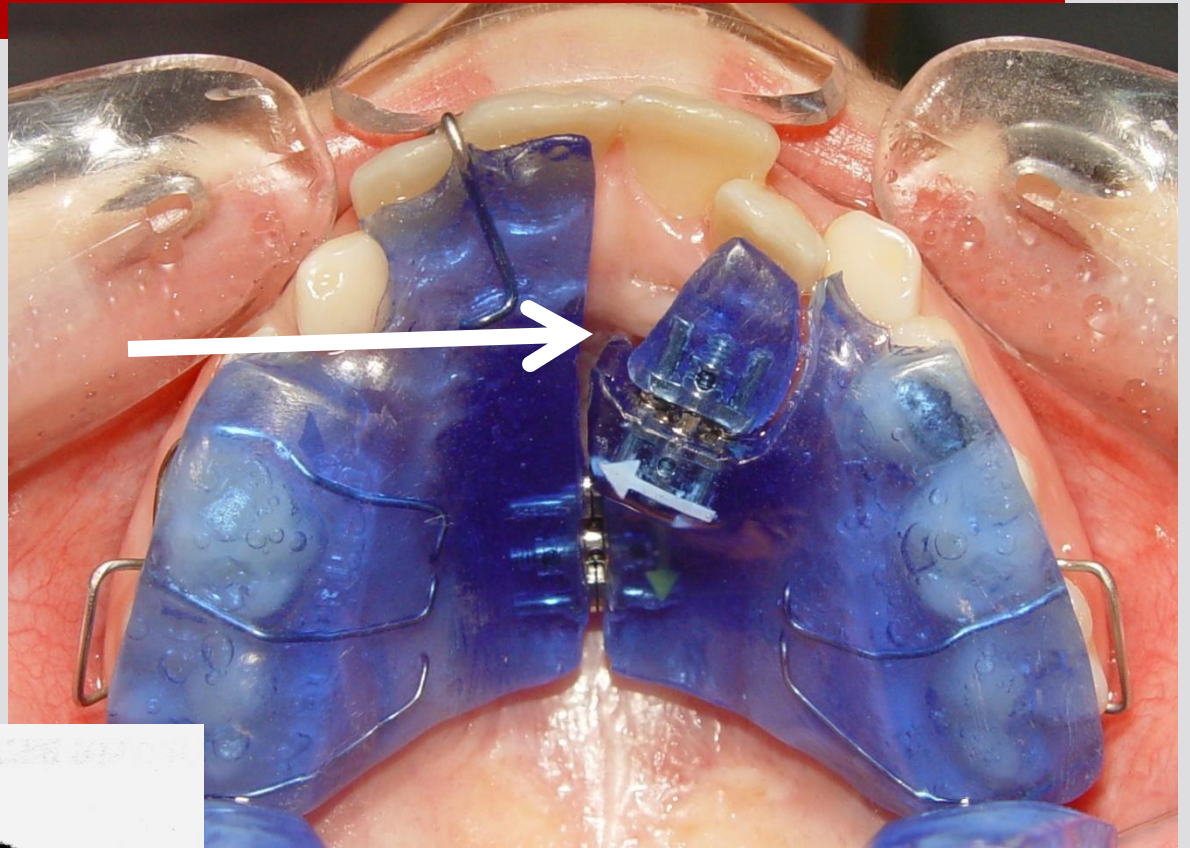


# COFFIN SPRING

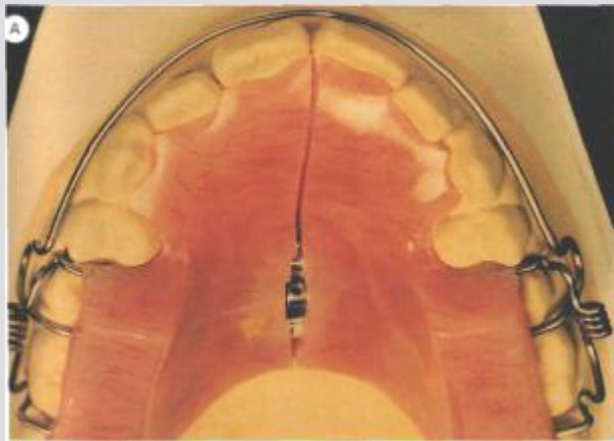
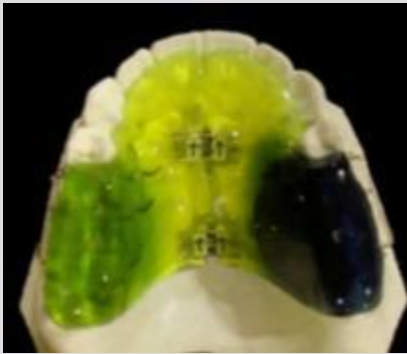


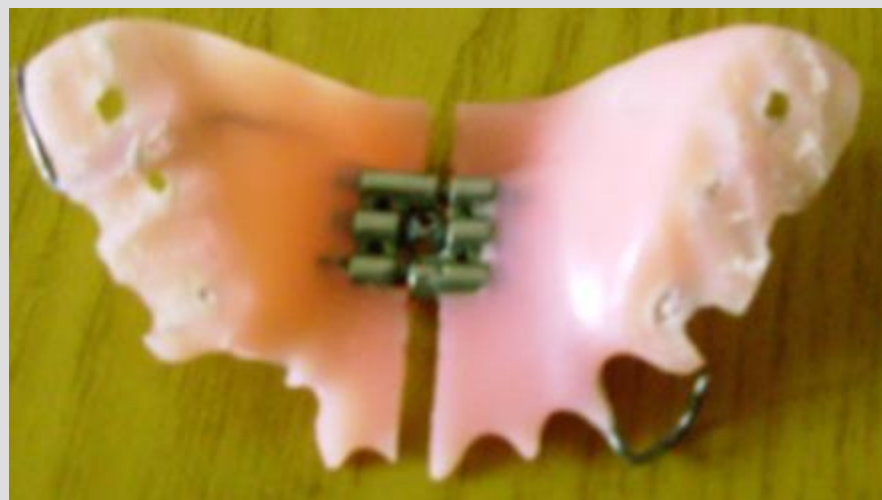


# Mini-screw



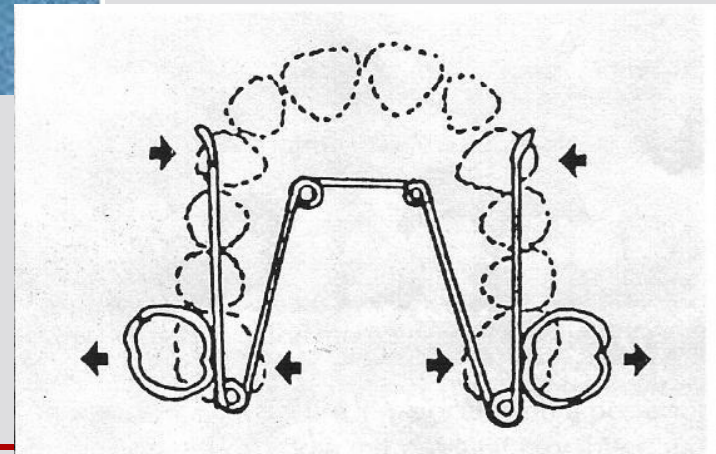
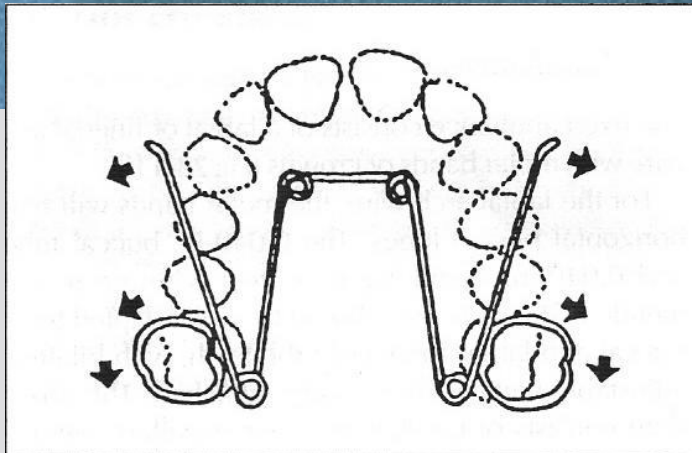








## QUAD HELIX

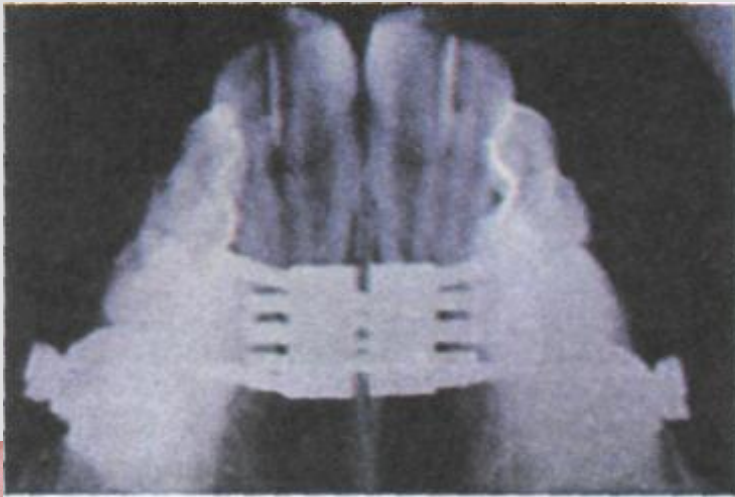








# RAPID MAXILLARY EXPANSION









**Cross elastics**

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**surgery**







**Thanks!**