

# THE INTERCEPTIVE ORTHODONTICS

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IV yr BDS Part I

Def:

as that phase of science and art of orthodontics employed to recognize and eliminate the potential irregularities and malpositions in the developing dentofacial complex.

( by the American Association of Orthodontists 1969)

It include:

- ⦿ Crowding
- ⦿ crossbite
- ⦿ Space regaining
- ⦿ Midline diastema
- ⦿ Orthopedic guidance

# CROWDING

## Incisal liability

Permanent incisor being larger than their deciduous counterparts ,results in crowding.

## Crowding may resolve:

- Interdental spacing - when permanent incisors erupt →deciduous canine shift laterally to align themselves and relieve crowding. If interdental spacing is absent ,shift is not possible.
- Inter canine arch width :increase by 6 mm in maxilla and 4 mm in mandible
- Inclination of the permanent incisors: forward inclination
- Ratio of size between permanent and primary teeth

# MANAGEMENT OF CROWDING

1.Observation :crowding  $<2\text{mm}$  will correct themselves

2.disking of primary tooth

- space required  $\leq 3-4\text{mm}$

- grinding mesial surface of canine

3.extraction of teeth  $\rightarrow$  serial extraction

- $\rightarrow$  timely extraction

- $\rightarrow$  wilkinsons extraction

- $\rightarrow$  balancing extraction

# SERIAL EXTRACTION

## HISTORY

initiated - Bunon(1743)

coined - Kjelgren(1929)

popularised - Nance(1940)

(father of serial extraction )

- ⊙ DEF :
- ⊙ Dewel(1967) orderly removal of selected primary and permanent tooth in a predetermined sequence.
- ⊙ current concept: as a correctly timed planned removal of certain deciduous and permanent teeth in mixed dentition stages with dentoalveolar disproportion i.e teeth to supporting bone imbalance in order to :
  - A)alleviate crowding of incisor teeth
  - B)allow unerupted teeth to guide themselves to improved positions
  - C)lessen the period of active appliances therapy  
or eliminate it

# INDICATIONS

1. Class I with anterior crowding
2. Arch length deficiency
  - a. lingual eruption of LI.
  - b. midline shift potential - unilateral canine loss
  - c. crowded upper and lower anteriors
  - d. lack of physiologic spacing
  - e. anomalies like ankylosis , ectopic eruption
  - f. lower anterior flaring
  - g. abnormal primary canine root resorption
3. Patients with straight profile and pleasing appearance

# CONTRAINDICATIONS

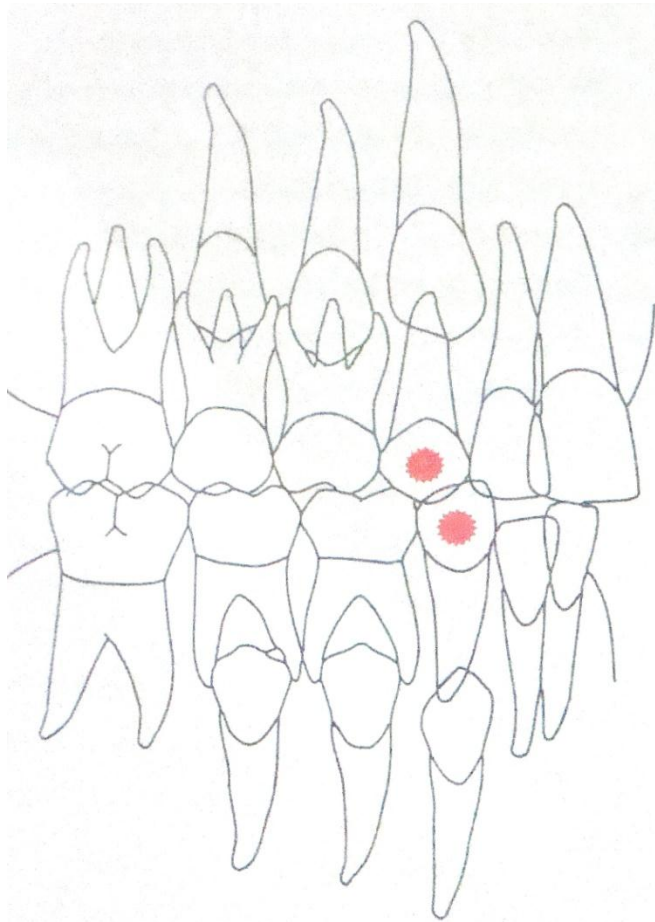
- 1.Mild to moderate crowding
- 2.Congenital absence of teeth providing spaces
- 3.Extensive caries of 1st perm molar
- 4.Open bite /deep bite
- 5.Severe classII or III
- 6.Cleft lip / palate
- 7.Midline diastema
- 8.spaced dentition
- 9.anodontia/oligodontia



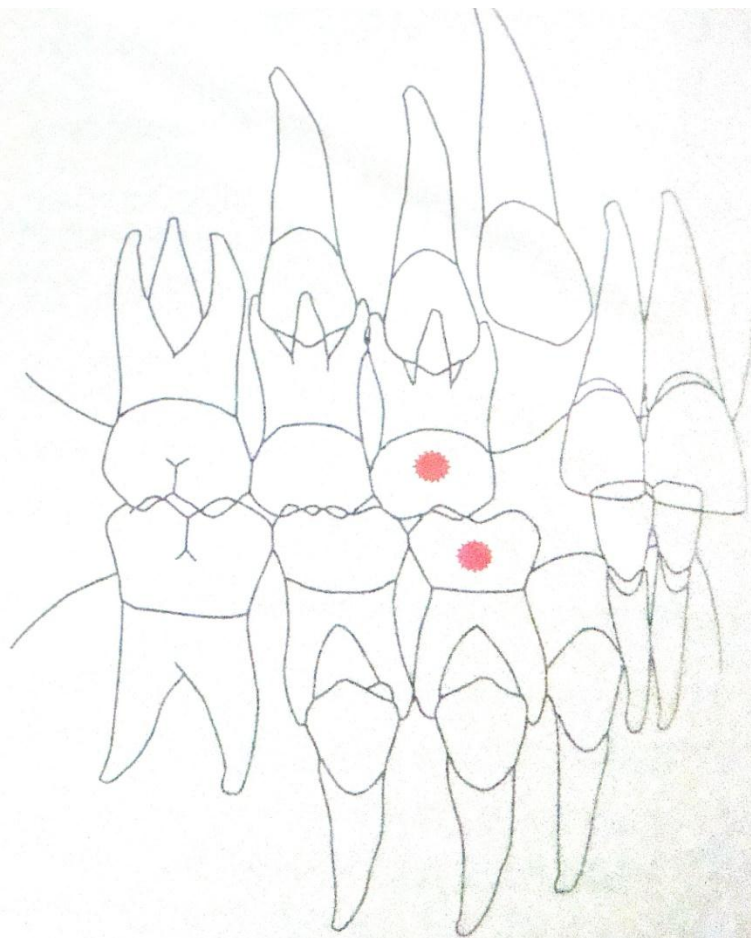
# Procedures

- 1.Dewels method
- 2.Tweeds method
- 3.Nance method
- 4.Dales method

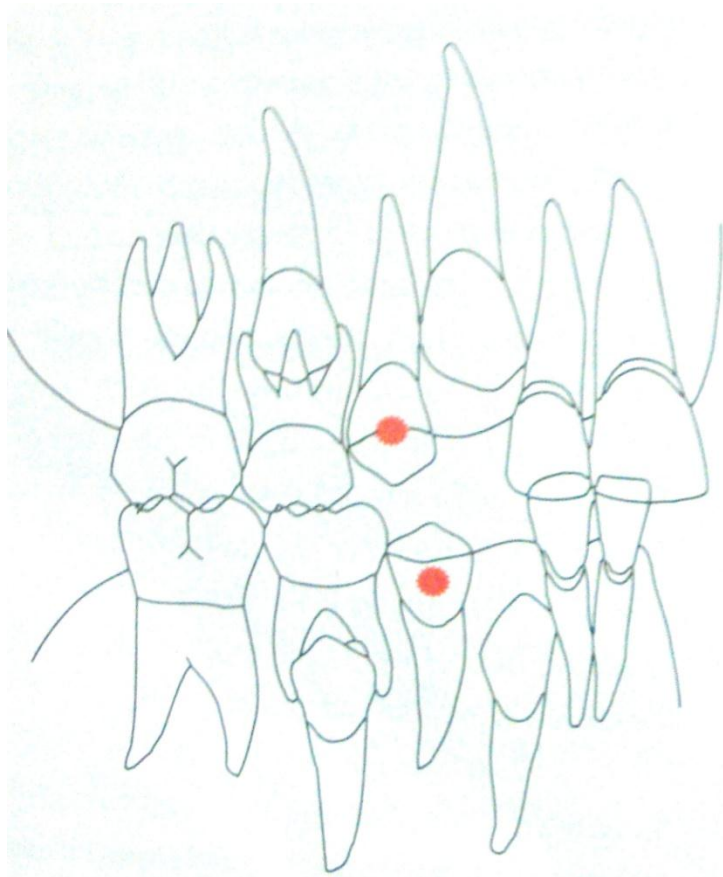
1.Dewels method  
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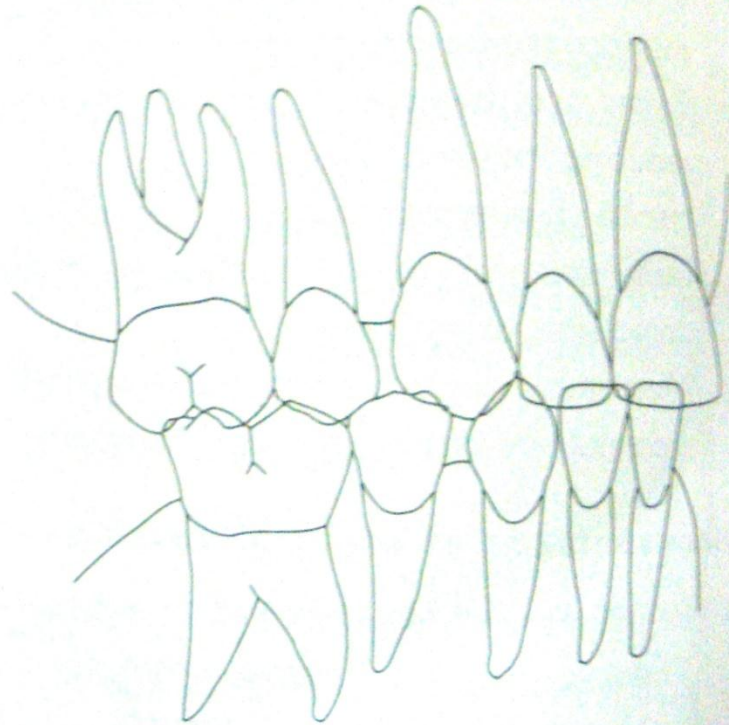
A



B



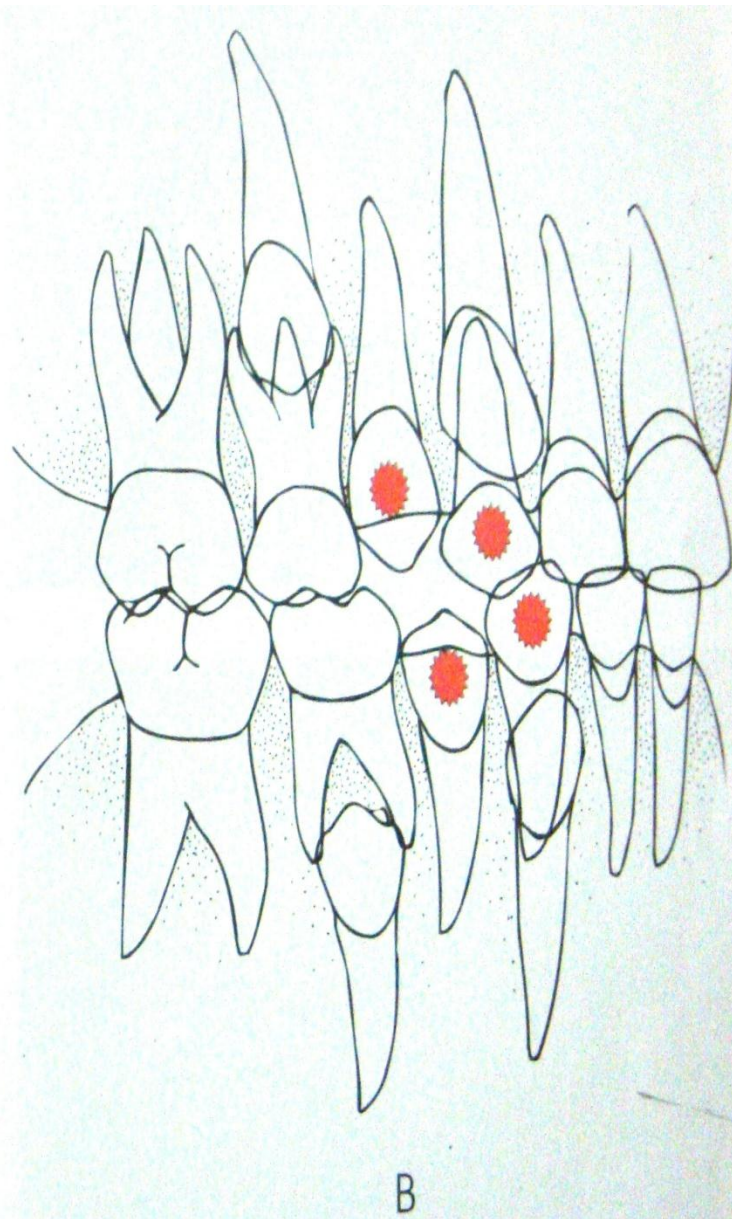
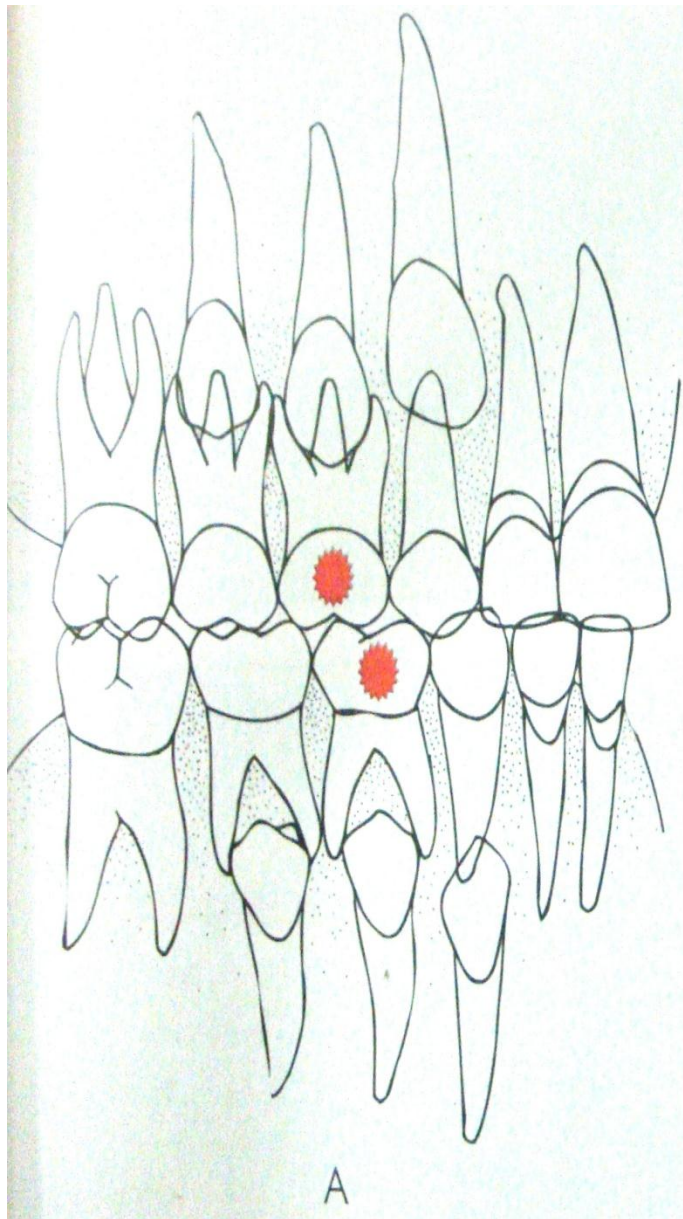
C



D

2. Tweeds method  
sequence:d4c





### 3.Nance method

1st - D    2<sup>nd</sup> - C+4

### 4.Dales method

#### Advantages of serial extraction

- further appliance therapy is minimized /eliminated
- more physiologic
- reduces the duration of multibanded fixed treatment
- Psychologic trauma associated with malocclusion can be prevented

- Better oral hygiene possible

## DISADVANTAGES

- Often followed by fixed appliance therapy
- Used only selectively in class II malocclusion
- Lack of patient cooperation
- Canines may remain impacted
- Chances of developing anterior deep bite with extraction of buccal teeth.
- Ditching:

➤ TIMELY EXTRACTION  
(BY STEMM 1973)

- Similar to serial extraction
- No perm teeth are removed
- Sequential removal of deciduous teeth





**38.8a** Timely extraction—Pretreatment



**Fig. 38.8b** Post-treatment

➤ WILKINSONS EXTRACTION

extraction of all 1<sup>st</sup> permanent molar

➤ BALANCING EXTRACTION

to avoid shift of midline to extraction  
space

# CROSSBITE

## CLASSIFICATION:

- ◉ Anterior /posterior
- ◉ Unilateral/bilateral
- ◉ True/functional
- ◉ Combination

## ANTERIOR CROSSBITE

Should be treated as it is:

- Self perpetuating (deciduous→mixed→permanent)
- Leads to skeletal malocclusion → ortho treatment and surgeries
- Traumatic occlusion → stripping of gingival tissue → pocket formation , unsightly wear facets

# TREATMENT

1. **Occlusal equilibrium:** remove premature tooth contacts-incisal grinding
2. **Tongue blade therapy:**  
Simple tooth anterior crossbite
3. **Lower inclined plane (by catalan)**

Disadvantage

- possibility of opening bite by wearing it longer than 2 or 3 weeks
- exact amount of labial movement is not predictable









4. Stainless steel crown
5. Composite incliners
6. Removable Hawleys appliance-  
with Z springs-wear 24 hrs a day

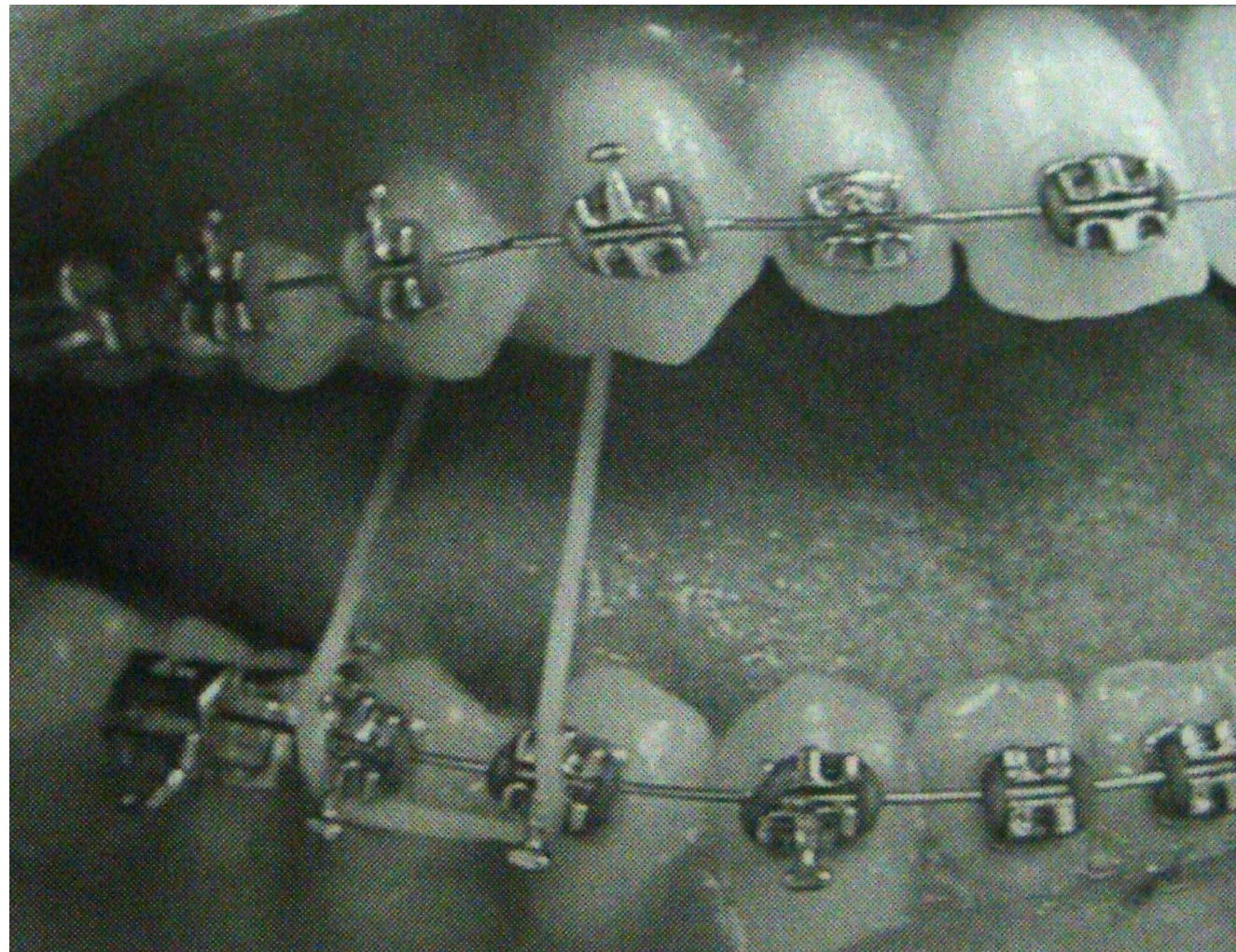




## 7. Fixed appliance-lingual arch or auxiliary springs with lingual or palatal arches

## POSTERIOR CROSSBITE TREATMENT:

- Occlusal equilibrium(bilateral lingual crossbite)
- Removable W arch appliance(bilateral dental crossbite conditions)
- Cross elastic appliance(unilateral crossbite)  
disadvantage-patient cooperation, ↑d armamentarium)



- Removable hawleys appliance with offset jackscrew(two teeth unilateral dental crossbite)  
→appliance should be worn for retention





Skeletal correction-2forms

- a.Slow palatal phase
- b.Rapid palatal phase

Appliance used are:

- minnesota expander
- hyrex jackscrew
- fixed splint palate acrylic appliance

# SPACE REGAINING

- ◉ Space maintenance is necessary in early loss of posterior primary teeth because it contributes to development of occlusal disharmonies. so when space is lost ,therapy should be done to regain it

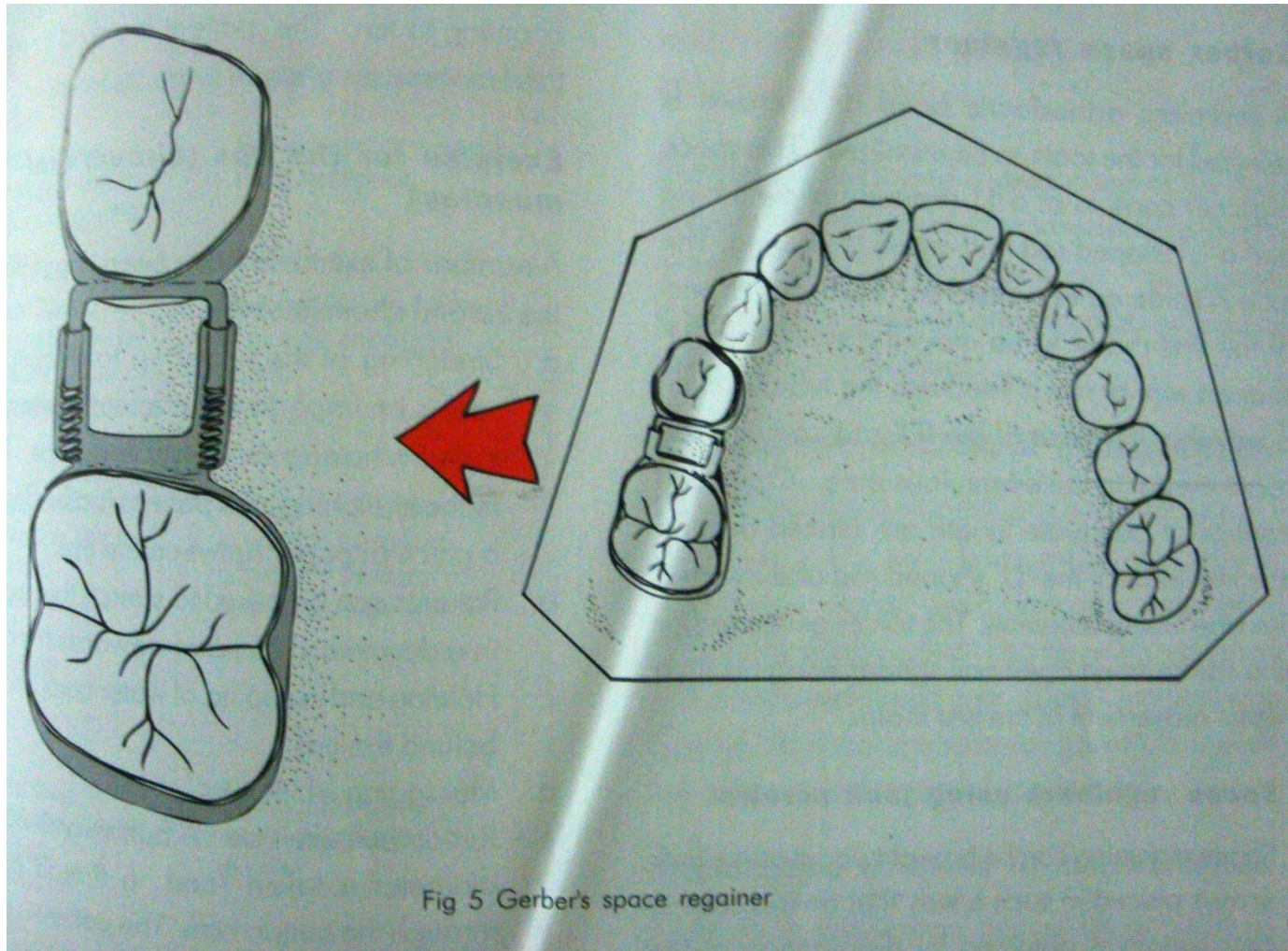
considerations:

- alignment and space needs of the other teeth in the arch
- the relationship of teeth to denture base
- the transverse and sagittal dental relationship
- the vertical relationship

# FIXED SPACE REGAINER

1. Gerber space regainer
  - short appointment





## 2. Opencoil space regainer

used in mandibular arch when the first pre molar has erupted into oral cavity

→ molar band on 1<sup>st</sup> permanent molar -molar tubes

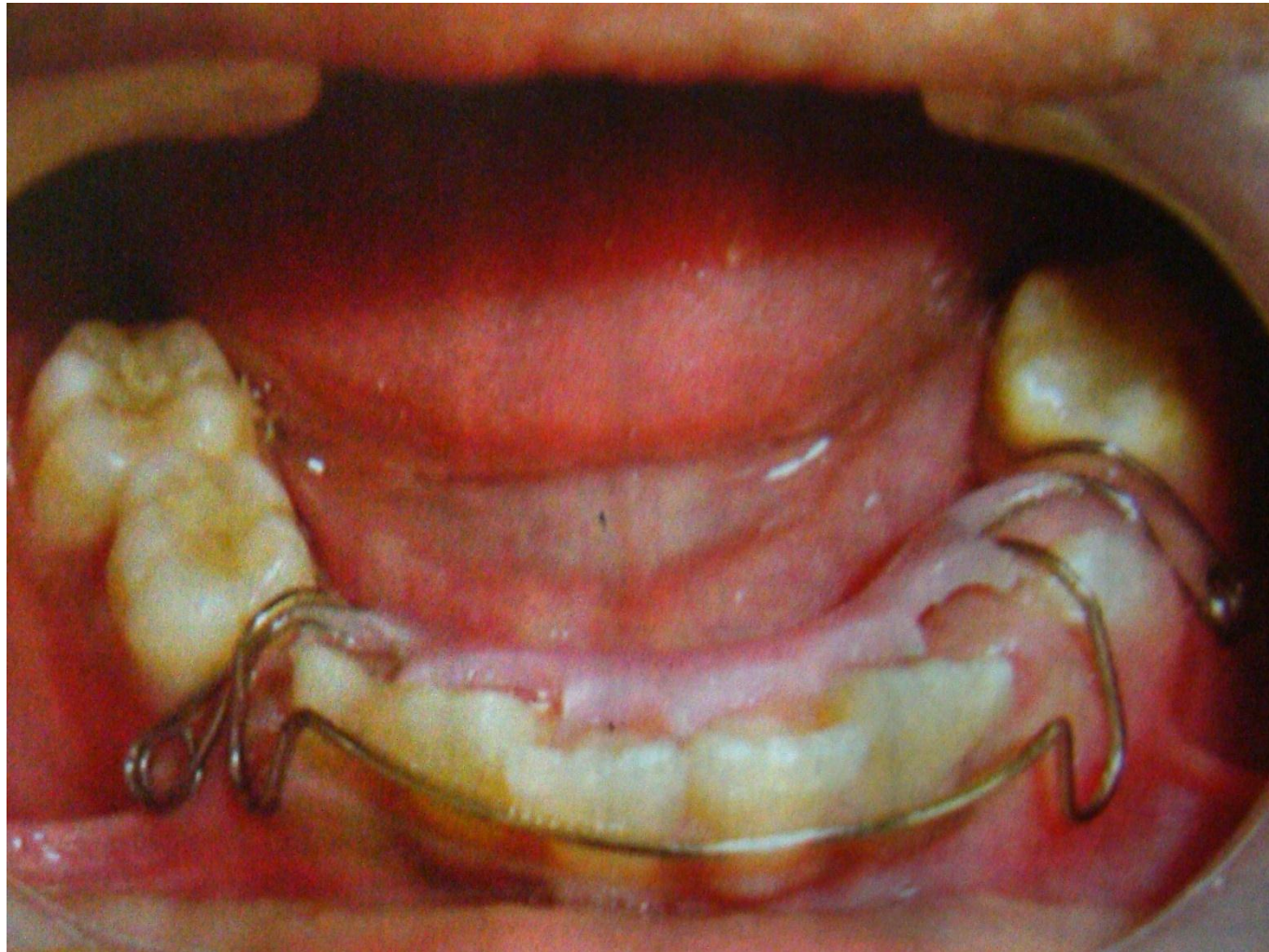
-requires no lab work





### 3. Hotz lingual arch

adv: it facilitate frequent removal of the arch for the purpose of activation





#### 4.sectional arch technique

- upto 4mm space can be regained
- used when 2<sup>nd</sup> molar has erupted

#### 5.lip bumper

- used when bilateral movement is required

#### 6.anterior space regainer

### REMOVABLE SPACE REGAINER

#### 1.Free end loop space regainer

#### 2.Split saddle /split block space regainer

- acrylic block is split buccolingually and joined by no 0.025 wire in the form of a buccal and lingual loop

### 3.Sling shot space regainer:

Here distalizing force is produced by the elastic stretched on the lingual surface of molar to be moved.

### 4.Jack screw

Encorporates expansion screw in edentulous  
space

# MAXILLARY MIDLINE DIASTEMA

as the space greater than 0.5 mm between proximal surface of adjacent teeth.

## ETIOLOGY AND TREATMENT PLAN

1. Normal developing dentition
  - resolves by itself with eruption of permanent canines
2. familial evidence
  - appliance therapy
3. Parafunctional habits
  - correction of habits
  - habit breaking appliance
4. Tooth size discrepancies
  - a) excessive anterior vertical overlap



b) retrognathic or prognathic mandible

5. Frenum attachments

6. mesiodistal angulation of tooth

correction of crown angulation

7. tooth anomalies

supernumerary tooth - removal + closure  
of diastema

peg shaped laterals - orthocorrection  
+ esthetic correction

absence of laterals - fixed  
prosthesis + ortho treatment



# APPLIANCE THERAPY

## I. removable appliance

- ◉ active plate incorporating palatal finger springs or modified cantilever spring
- ◉ Split labial bow
- ◉ Hawleys plate with an active labial bow

## II. Fixed appliance

long term retention needed

# MUSCLE EXERCISE

- ◉ Helps in improving aberrant muscle function

- ◉ MASSETER MUSCLE

clenching of teeth by the patient while counting to ten.repeat this for some duration of time.

- ◉ LIPS

- stretching of upper lips
- holding and pumping of water back and forth behind the lips
- massaging of the lips
- button pull exercise
- tug of war exercise

## ◉ EXERCISE FOR THE TONGUE

### 1. One elastic swallow

- 5/16 inch intra oral elastic plastic placed on tip of tongue
- pt asked to raise the tip of tongue and hold the elastic against the rugae area and swallow

### 2. Tongue hold exercise

- elastic over tongue in a designated spot with lips closed
- pt is then asked to swallow with elastic in place and lips apart.

### 3. Two elastic swallow

- two elastic are placed in tongue-1 in midline and 2<sup>nd</sup> on tip
- pt asked to swallow with the elastics in position

### 4. The hold pull exercise

- the tip of tongue and the midpoint are made to contact the palate and the mandible is gradually opened
- helps in stretching the lingual frenum



# SURGICAL REMOVAL OF SOFT TISSUE/BONY BARRIER

- ◉ Surgical exposure of crown for un erupted tooth
- ◉ Excise soft tissue and remove any bone overlying the crown
- ◉ Surgical wound given a cement dressing for a peroid of 2 weeks

# FUNCTIONAL JAW ORTHOPEDICS

- ◉ A functional appliance can be defined as a removable appliance which favourably changes the position of the soft tissue environment.  
by frankel

## CLASSIFICATION

- ◉ Removable  
fixed
- ◉ Tooth borne passive eg:bionator  
tooth borne active eg:clarks twin block  
tissue borne eg:frankels functional  
regulator

## Components include

1. Eruption bite plane
2. Linguo-facial muscle balance → shields and crowns
3. Mandibular repositioning-construction or working bite.

## INDICATIONS:

1. Use of functional appliance alone  
→ mild skeletal discrepancy, proclined upper incisors , no dental crowding
2. Use of functional appliance + fixed appliance  
→ to improve anteroposterior relationship  
→ useful in class II cases
3. Interceptive treatment  
→ utilises growth enhancing effect  
→ reduce the prominence of proclined upper incisors

# COMMON APPLIANCE IN USE

## 1. ACTIVATOR

Monobloc-Robin 1902

Modified-Andresen 1936

Activator 1957

INDICATION:-

Class II DIV I AND DIV II

CLASS III

OPEN BITE

CONTRAINDICATION:-

## Crowding

Individual tooth movements

### DURATION OF USE:-

- Overjet of 8mm, require 10-12months
- Night wear appliance

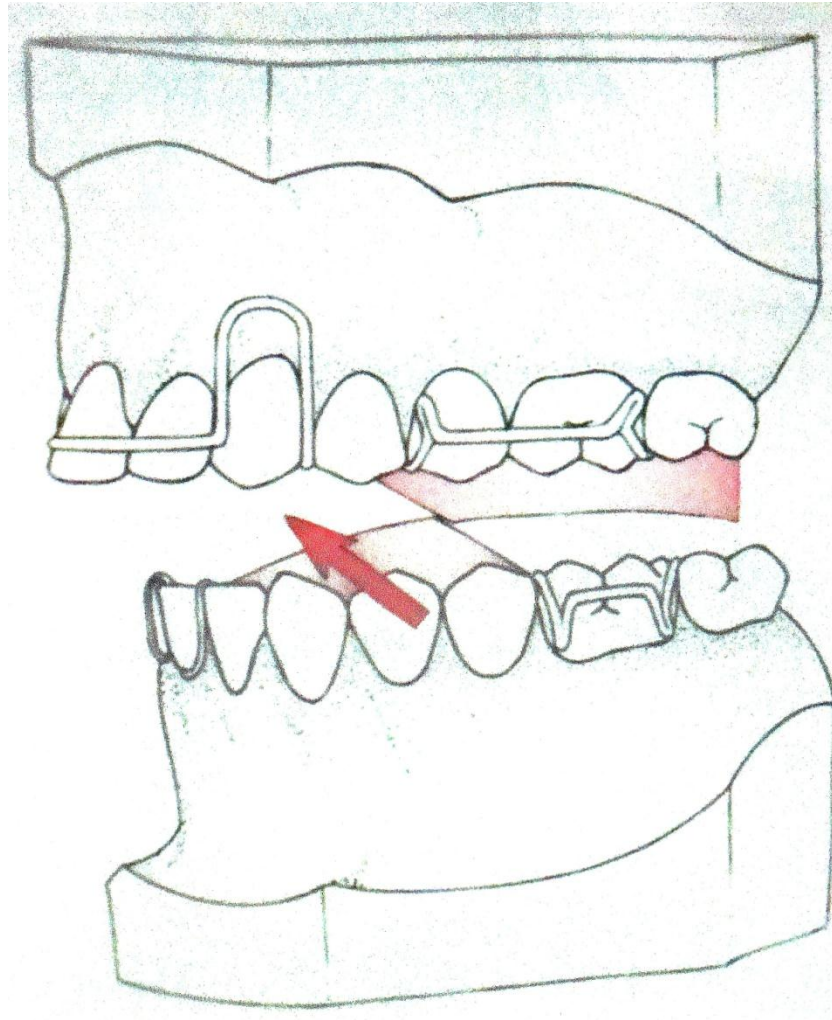
## 2. BIONATOR

Balters 1964

- Less bulky
- 3 types

- ◉ Standard appliance
    - For deficient mandible
  - ◉ Open bite appliance
    - To inhibit abnormal position of tongue
  - ◉ Class III appliance
    - To stimulate the growth of under developed maxilla
3. CLARK'S TWIN BLOCK
- Clark 1988





4. FRANKEL'S FUNCTIONAL REGULATOR

Used to hold away muscle from dentition so that the dento-alveolar structures are free to develop.

5. HORSE SHOE APPLIANCE

Schwartz 1997

For class III molar relation.

6. HEAD GEAR

Extra oral force used to restrict the growth of maxilla

Anchorage in cervical, occipital and parietal regions.

Force is applied through teeth

## 7. PENDULUM APPLIANCE

Used for class I skeletal relation

Class II malocclusion

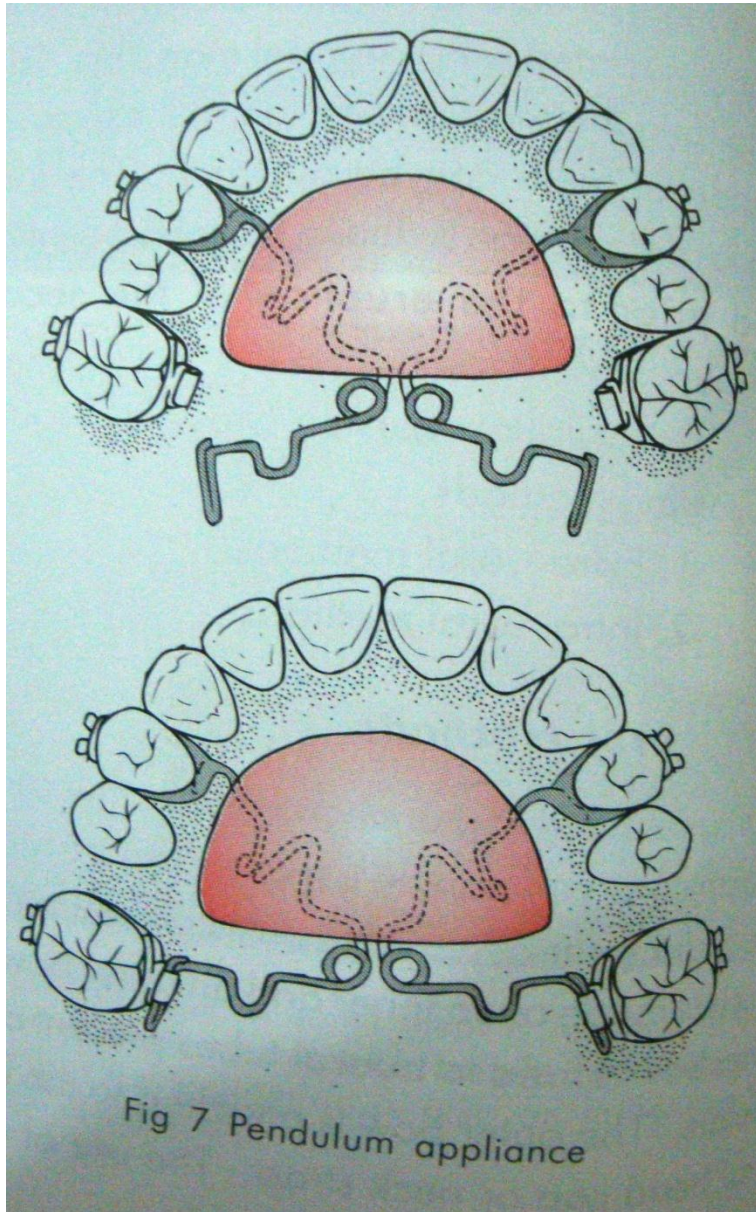


Fig 7 Pendulum appliance

## 8. CHIN CAP

Used in excessive growth of mandible





**Fig. 38.17c** Chin cap in lateral view

## 9. PRE ORTHODONTIC TRAINER

Used to intercept developing malocclusion





Tongue guard  
placed lingually

Starting/Phase I trainer



Finishing/Phase II trainer

(while permanent teeth are erupting and child still growing)

TYPES:-

a) STARTING / PHASE 1

Blue colour

Soft to wear

Imparts lighter force on teeth

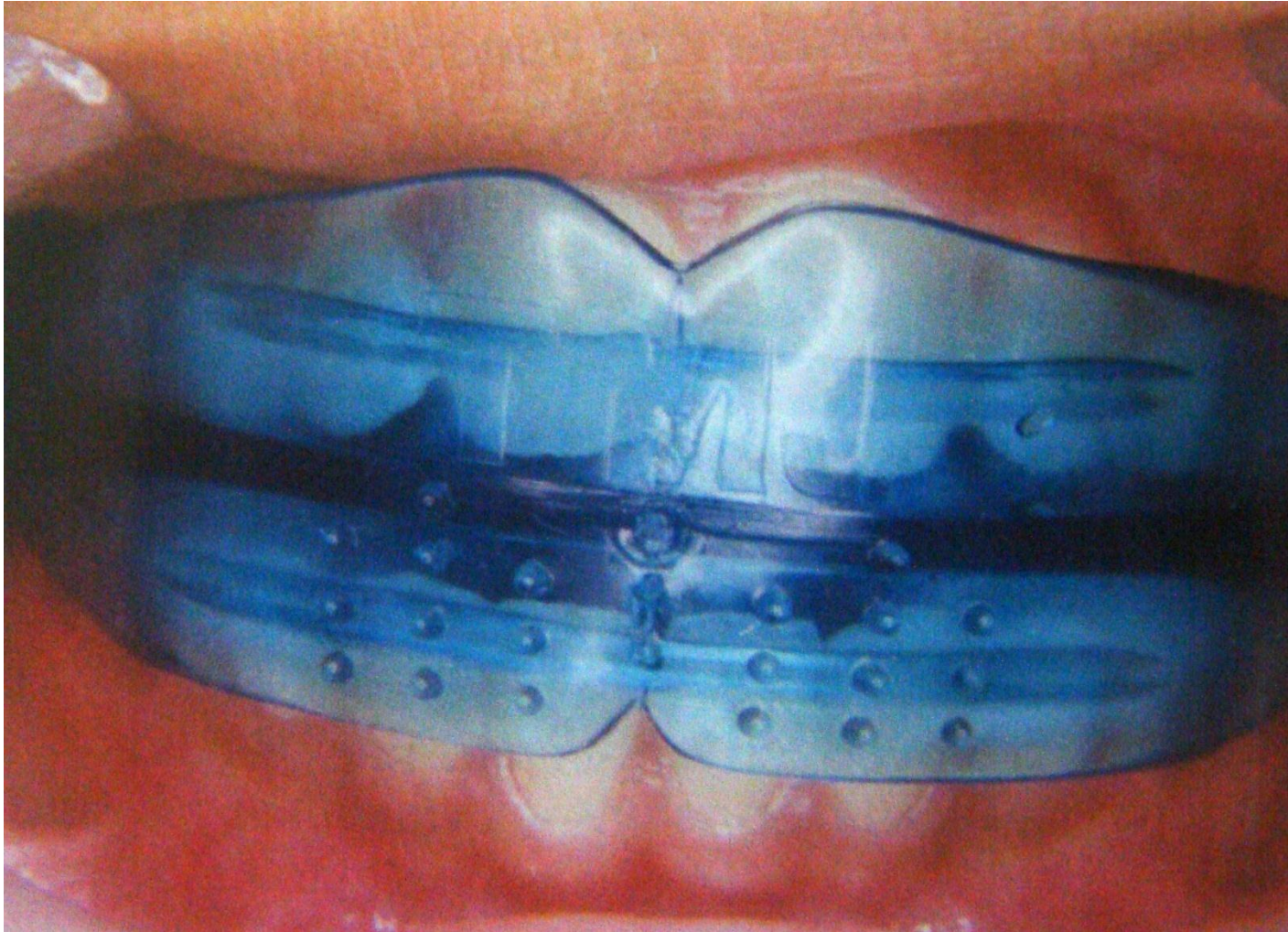
Used for 6-8 months

Flexible to adapt

b) Finishing / phase 2

Pink colour







Harder

Imparts higher force on malaligned teeth

PARTS:-

- i. Tooth channel and labial bows
- ii. Tongue tag and lip bumpers
- iii. Base

APPLICATION:-

- ❖ Early treatment of developing malocclusion
- ❖ Habit correction

- ❖ Dental alignment
- ❖ Prevents extractions
- ❖ Class II/III correction
- ❖ Limits bruxisim
- ❖ Closes open bite and opens deep bite
- ❖ Resolves lower anterior crowding

## FACTORS CONSIDERED WITH FUNCTIONAL APPLIANCE

- ❑ Best time: late mixed dentition
- ❑ Advantage taken of pubertal growth spurt

## LIMITATIONS AND COMPLICATIONS

- Discomfort as both upper and lower teeth are joined together
- Needs patient co operation
- Removed during mastication

- Interfere with speech
- Can be used only if horizontal growth pattern is present
- Prolonged treatment
- Lab and technical resources needed
- High cost

# REFERENCE

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