Preventive Orthodontics

By the end of the class you will be able to

- Introduction
- Definition
- Procedures - ***Parent education***

  - Caries control

  - Care of deciduous dentition

  - Extraction of supernumerary teeth

  - Occlusal equilibration

  - Maintenance of quadrant wise tooth shedding time table

  - Management of ankylosed tooth

  - Management of abnormal frenal attachments

  - Checkup for oral habits

  - Prevention of damage to occlusion, e.g. Milwaukee braces

  - Management of deeply locked first permanent molar

  - Space maintenance

Introduction

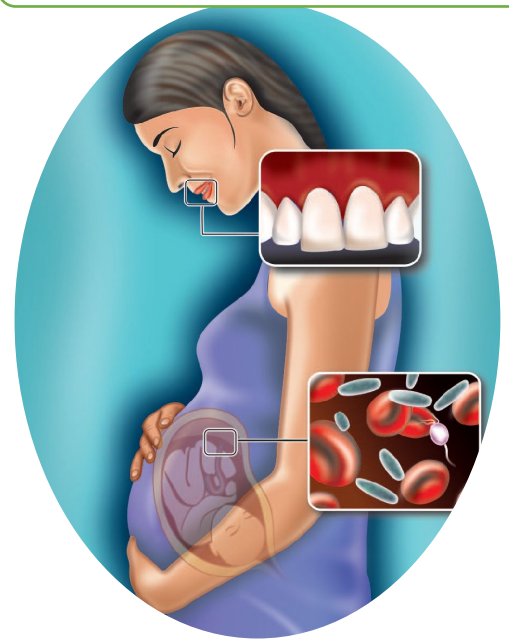
Definition

- **Graber** (1966) - can be defined as the action taken to preserve the integrity of what appears to be normal occlusion at a specific time.

- Proffit and **Ackerman** (1980) - Preventive orthodontics as the prevention of potential interference with occlusal development.

Parent Education

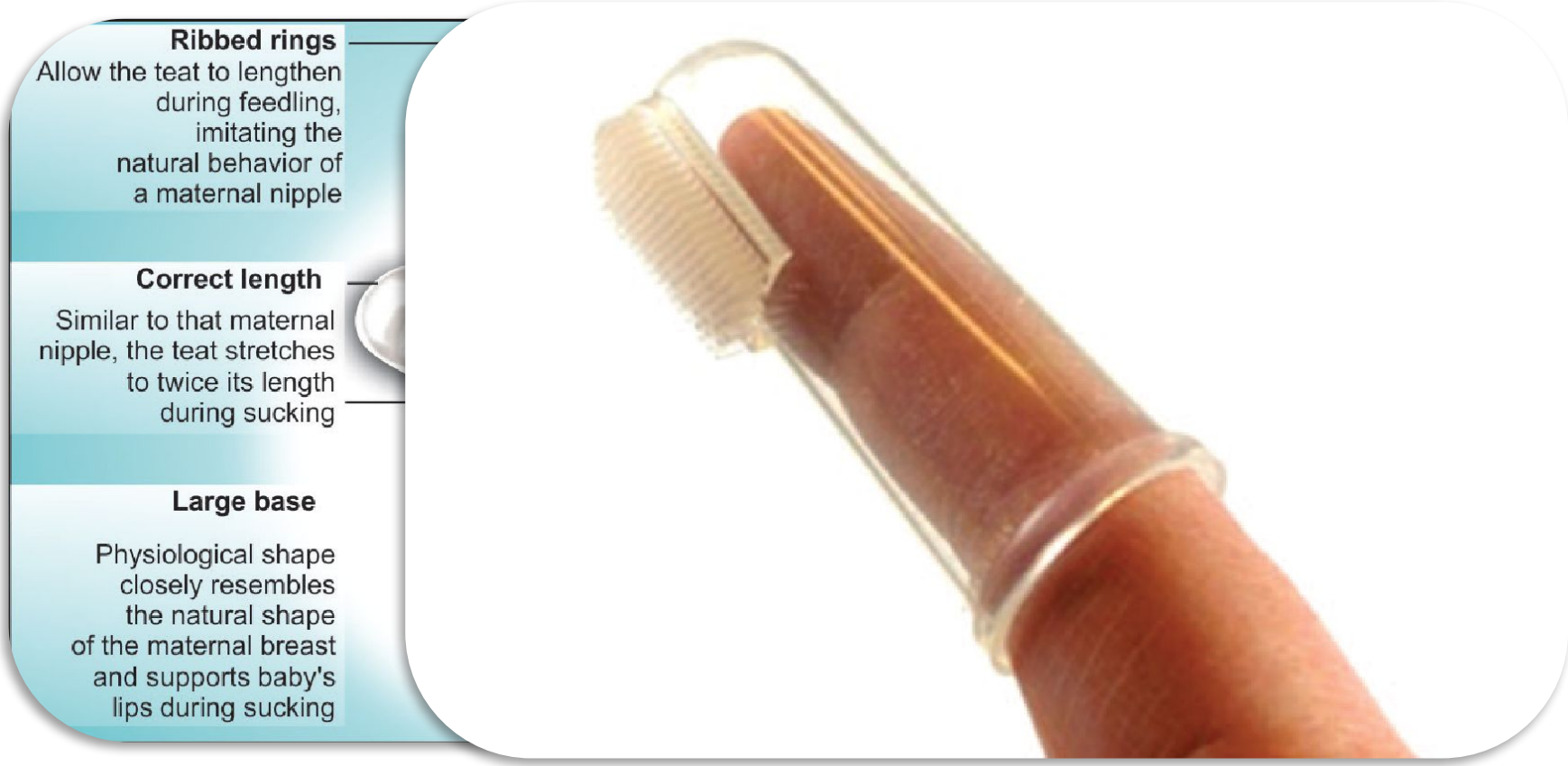
PRE NATAL



POST NATAL

- Birth to one year
- One to three years
- Three to six years
- Six years onwards

Birth to One Years



3-6 Years

6 years onwards

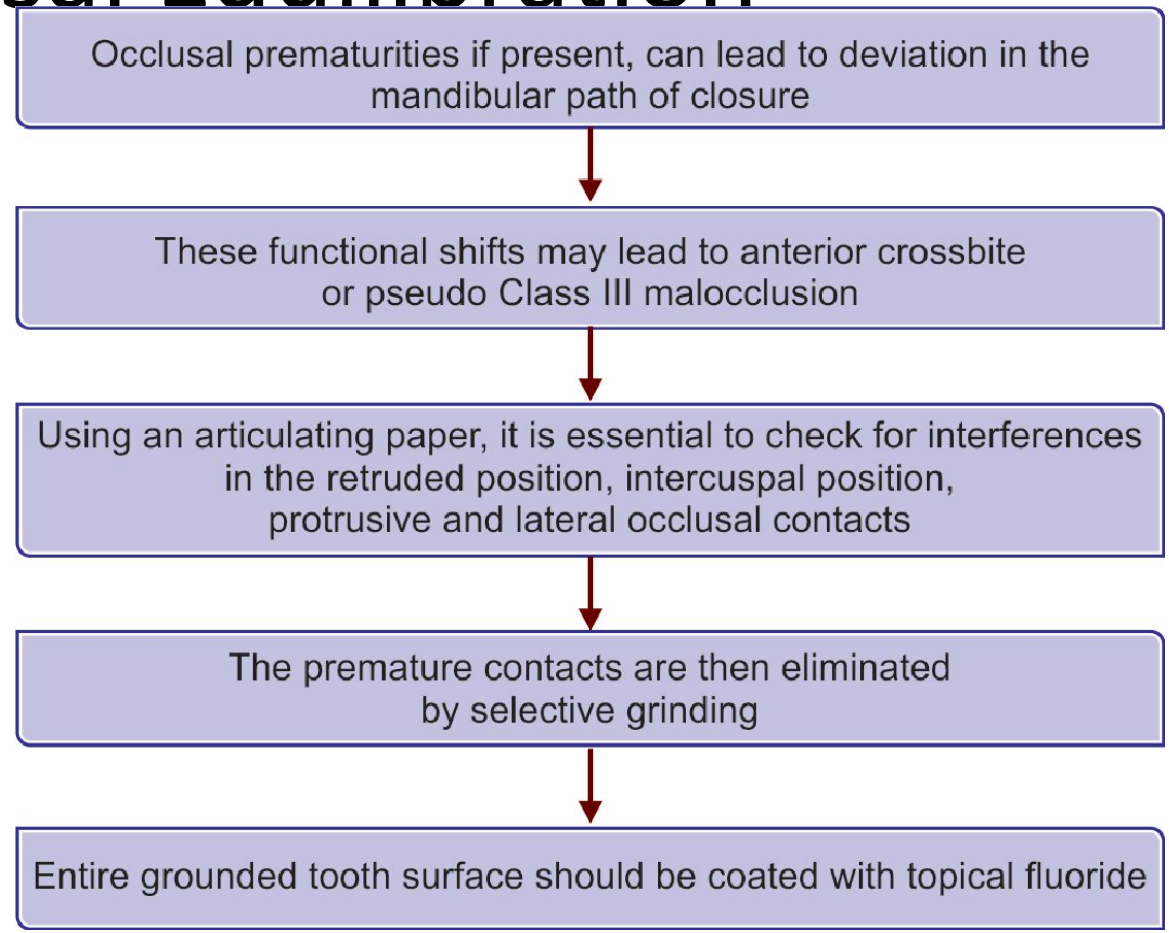
Caries Control

Care of Deciduous Teeth

- The deciduous teeth are excellent natural space maintainers until the developing permanent teeth are ready to erupt into the oral cavity. Thus all efforts should be taken to prevent early loss of deciduous teeth.

Extraction of Supernumerary Teeth

Occlusal Equilibration



Maintenance of Quadrant Wise Tooth Shedding Time Table

Not more than 3 months difference in shedding of deciduous teeth and eruption of permanent teeth in one quadrant as compared to the other is considered normal.Hence needs to be investigated immediately.

Delay might be due to:

1.over retained deciduous tooth or roots.

2.supernumerary teeth

3.cysts

4.over-hanging restoration in deciduous teeth

5.Fibrosis of gingiva

6.Ankylosed primary teeth

7.Improperly erupting succedaneous tooth

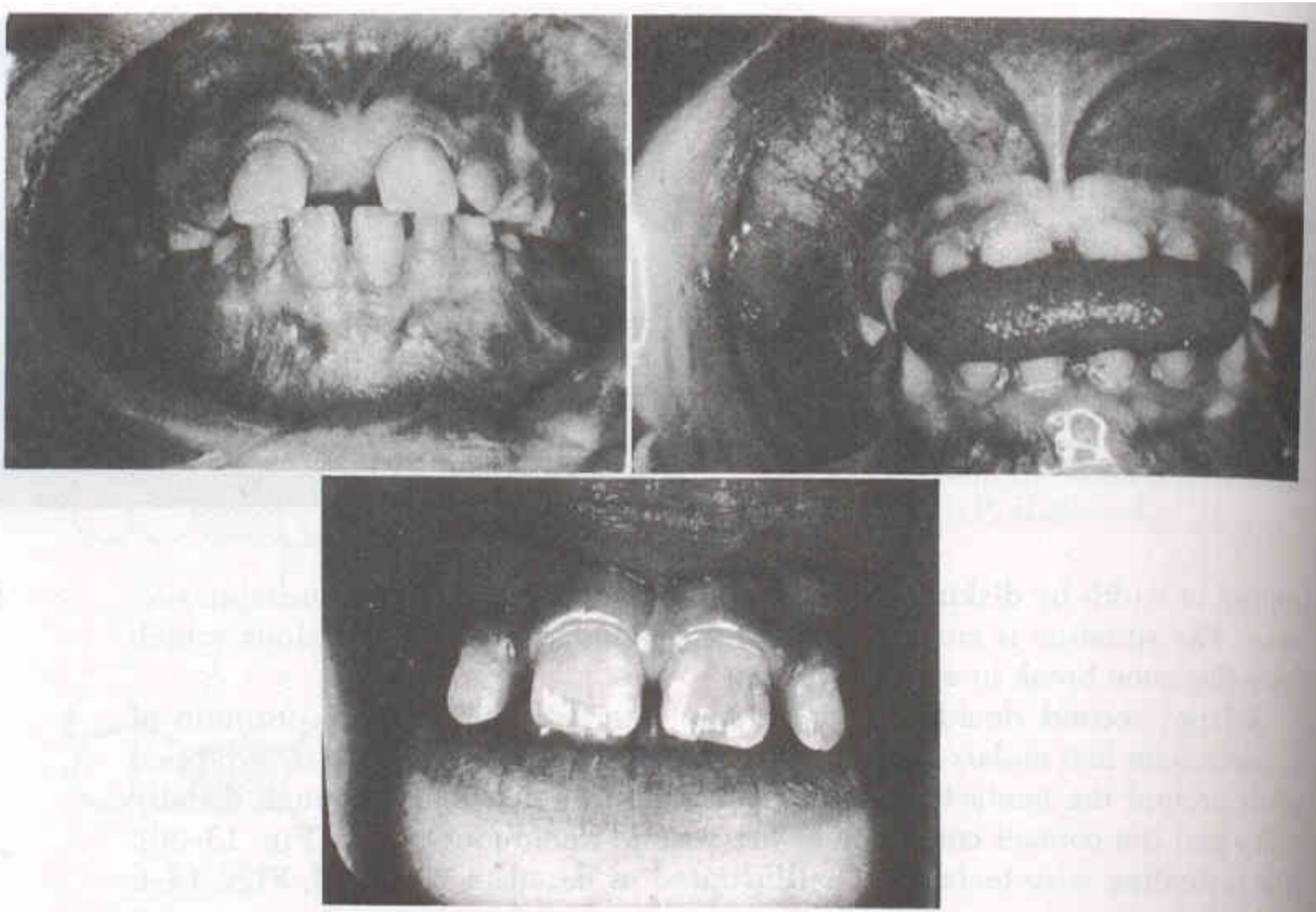
Management of Ankylosed Teeth

- Ankylosis is a condition characterized by the absence of the periodontal membrane in a small area or whole of the root surface leading to fusion of the tooth to the bone.As a result tooth does not get resorbed .
- This in turn will either prevent the deciduous teeth from erupting or deflect the eruption of the permanent teeth.
- Hence the ankylosed tooth should be diagnosed and surgically removed at an apppropriate time to allow the permanent tooth to erupt normally.

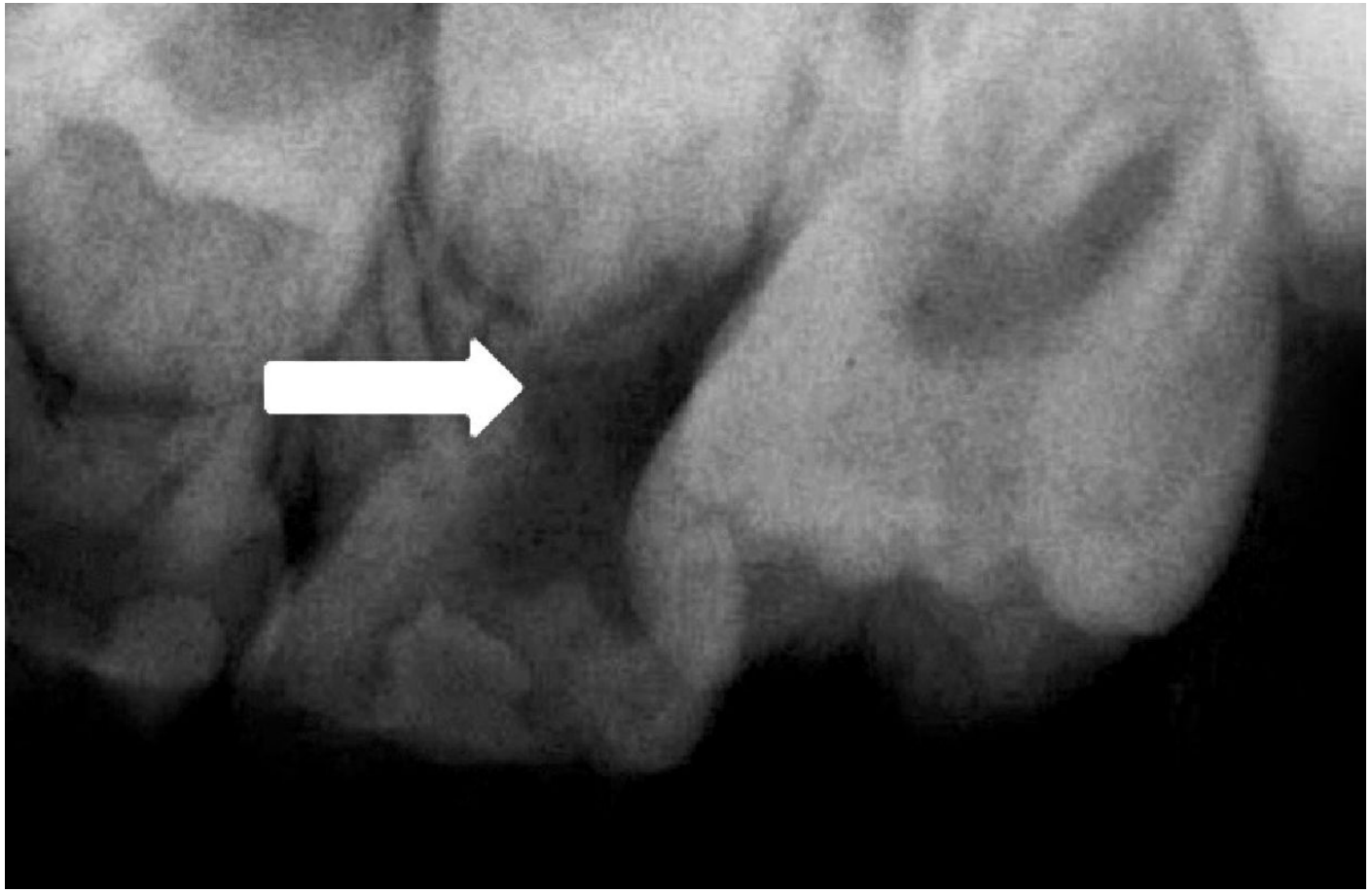
FRENAL ATTATCHMENTS

- In a newborn the labial frenum is literally attached to the crest of the alveolar ridge.As the teeth erupt the alveolar bone is laid down and hence leads to increase in the vertical dimension ,the frenum migrates superiorly with respect to the ridge
- The fibres of the frenum pass through the mucosa between the central incisors and into the lingual papilla.But usually are confined to a narrow band which might have minimal effect on incisor position.

- But the presence of thick and fleshy labial frenum might prevent the maxillary central incisors from approximating with each other leading to midline diastema.Usually abnormal frenal attachments are caused due to hereditary factors.
- Ankyloglossia also prevents normal functional development due to lowered position of the tongue and also abnormal speech and swallowing.
- Early detection and correction would prevent a full fledged malocclusion.

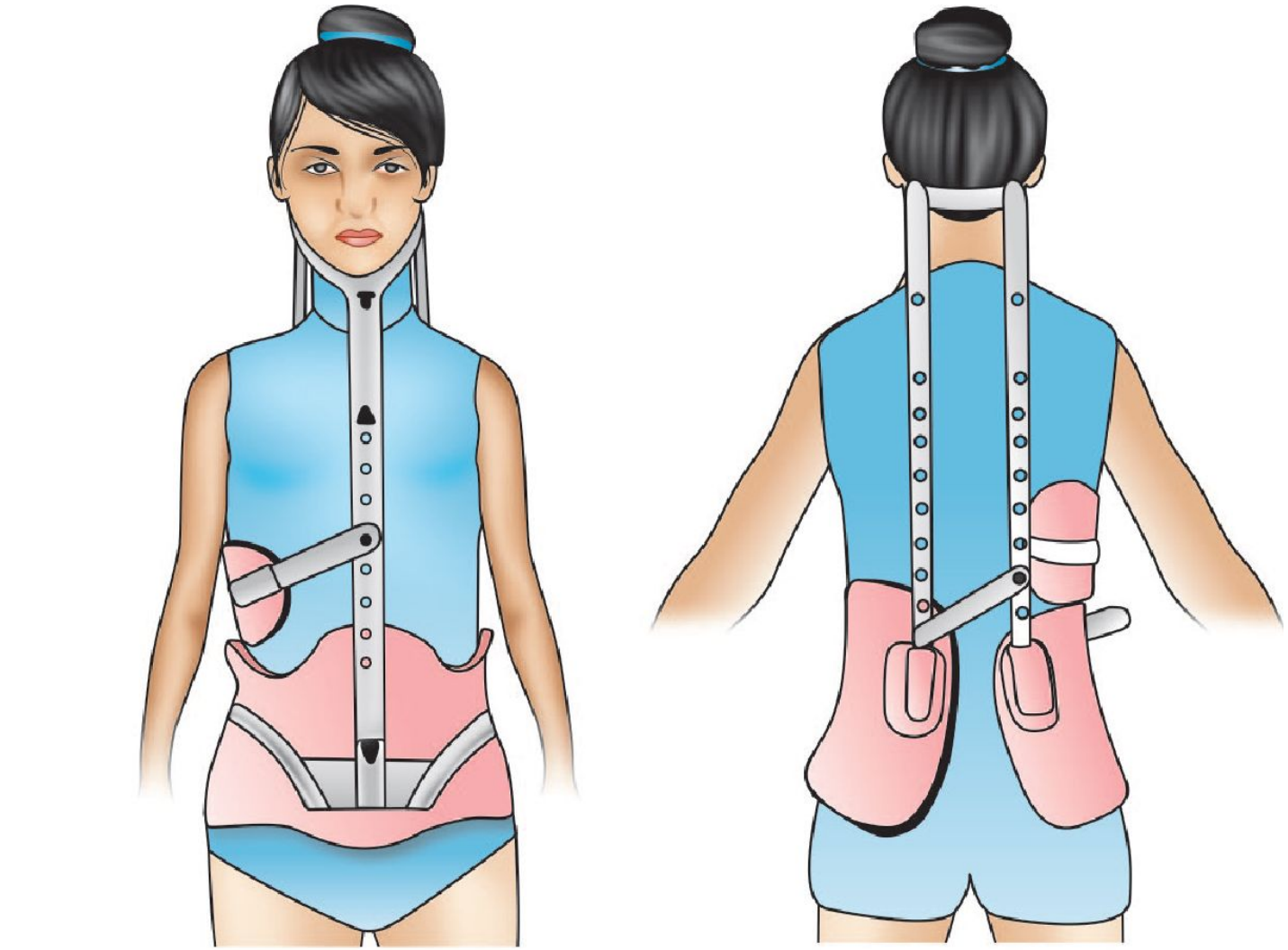


Management of Deeply Locked Permanent First Molars



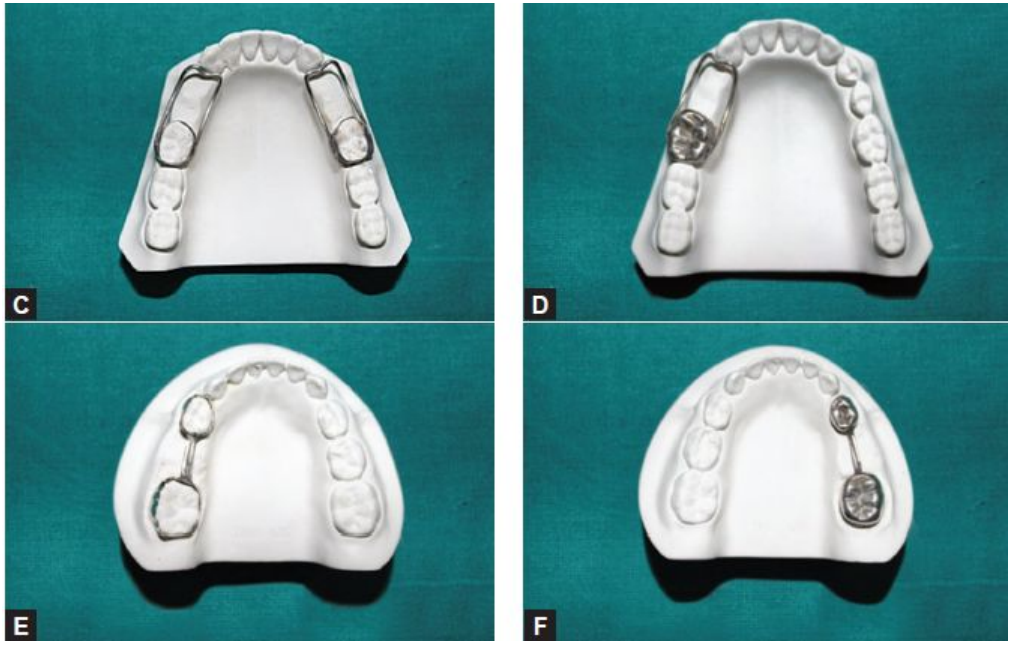
Oral Habits Check-up and Education

Preventing Milwaukee Brace Damage



Space Maintainers

SPACE MAINTAINERS



Space Maintenance

- *term was coined by **JC Brauer** in 1941. It is defined as the process of maintaining a space in a given arch previously occupied by a tooth or a group of teeth.*

Space Control

***Gainsforth** in 1955 defined it as careful supervision of the developing dentition; it reflects an understanding of the dynamic nature of occlusal development.*

Space Maintainer

*According to **Boucher** it is a fixed or removable appliance designed to preserve the space created by the premature loss of a primary tooth or a group of teeth.*

Objectives of space maintenance

- *Preservation of primate space.*
- *Preservation of the integrity of the dental arches.*
- *Preservation of normal occlusal planes.*
- *In case of anterior space maintenance, it should aid in esthetics and phonetics.*

INDICATIONS

- If the space after premature loss of deciduous teeth shows signs of closing.
- If the use of space maintainer will aid in or make the future orthodontic treatment less complicated.
- If the need for treatment of malocclusion at a later date is not indicated.
- When the space for a permanent tooth should be maintained for two years or longer.
- To avoid supra eruption of a tooth from the opposing arch.
- To improve the physiology of a child's masticatory system and restore dental health optimally.

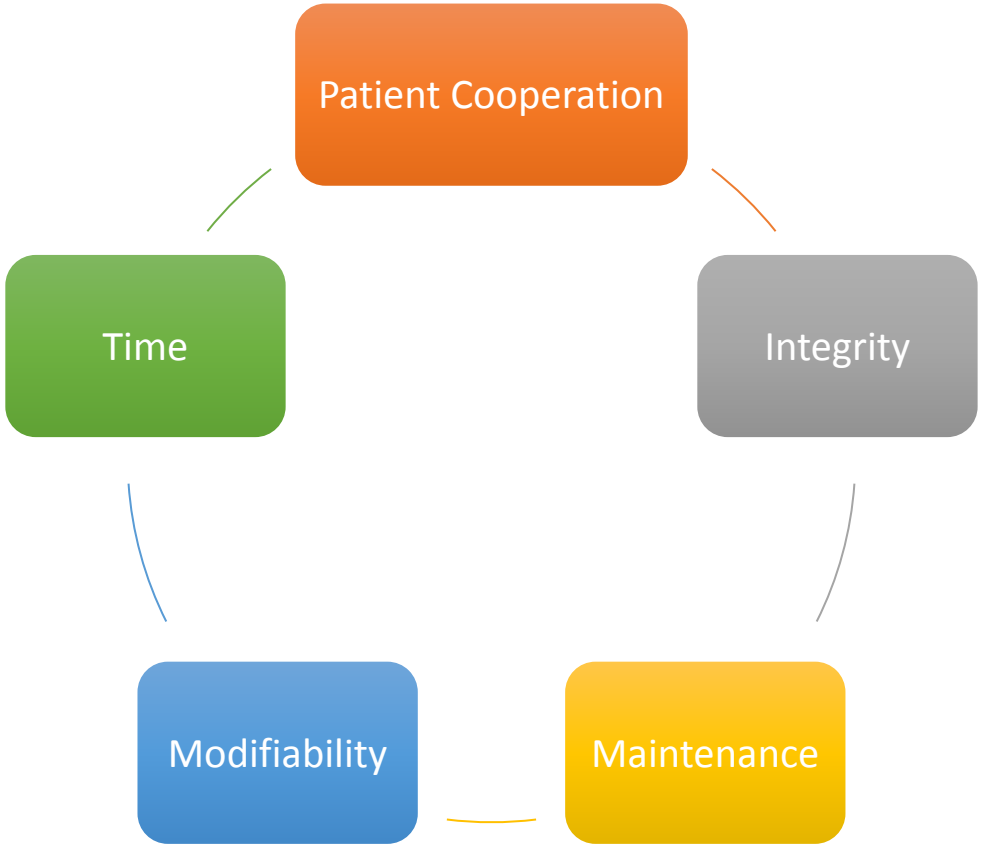
CONTRAINDICATIONS

- If the radiograph of extraction region shows that the succedaneous tooth will erupt soon.
- If the radiograph of extraction region shows one third of the root of succedaneous tooth is already calcified.
- When the space left by prematurely lost primary tooth is greater than the space needed for the permanent successor as indicated radiographically.
- If the space shows no signs of closing.
- When succedaneous tooth is absent

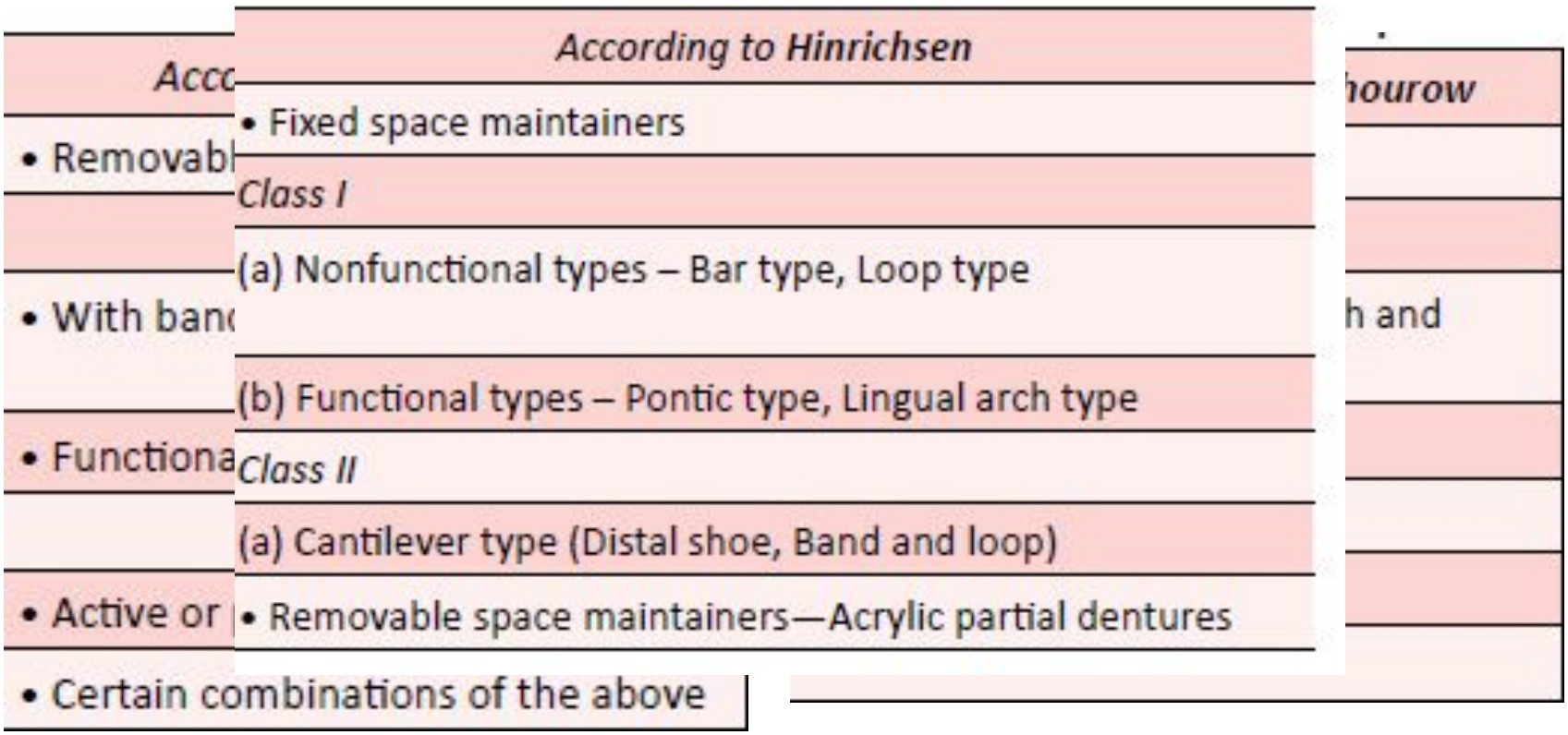
Requirements of space maintainers

- *It should maintain the entire space created by the lost tooth*
- *It must restore function*
- *Prevent supraeruption of opposing tooth*
- *It should be simple in construction*
- *Should be strong enough to withstand occlusal forces*
- *Should permit maintenance of oral hygiene*
- *Must not restrict the growth of jaws*
- *It should not exert undue forces of it's own.*

DETERMINANTS OF APPLIANCE SELECTION



CLASSIFICATION



FACTORS CONTRIBUTING FOR SPACE CLOSURE

- Path of eruption of molars
- Premature loss of primary molars
- Influence of buccal musculature
- Path of least resistance

FACTORS AFFECTING PLANNING OF SPACE MAINTAINERS

- Time elapsed since tooth loss
- Amount of space loss
- Rate of space closure
- Direction of space closure
- Eruption status of the adjacent teeth
- Amount of bone coverage
- Eruption status of succedaneous tooth
- Dental age of patient

	Maxilla		*Mandible*	
	D	E	D	E
First year	1.3 mm	2.8 mm	1.8 mm	2.4 mm
Second year	1.8 mm	4.5 mm	2.7 mm	3.1 mm
Third year	3.2 mm	8.0 mm	3.3 mm	4.5 mm

- Sequence of eruption
- Delayed eruption
- Available space
- Arch length adequacy
- Curve of Spee
- Abnormal oral habits

FIXED SPACE MAINTAINERS

Advantages

- Bands require no tooth preparation
- Do not interfere with eruption of abutment teeth
- Jaw growth is not hampered
- Succedaneous tooth is free to erupt
- Can be used in uncooperative patients.

Disadvantages

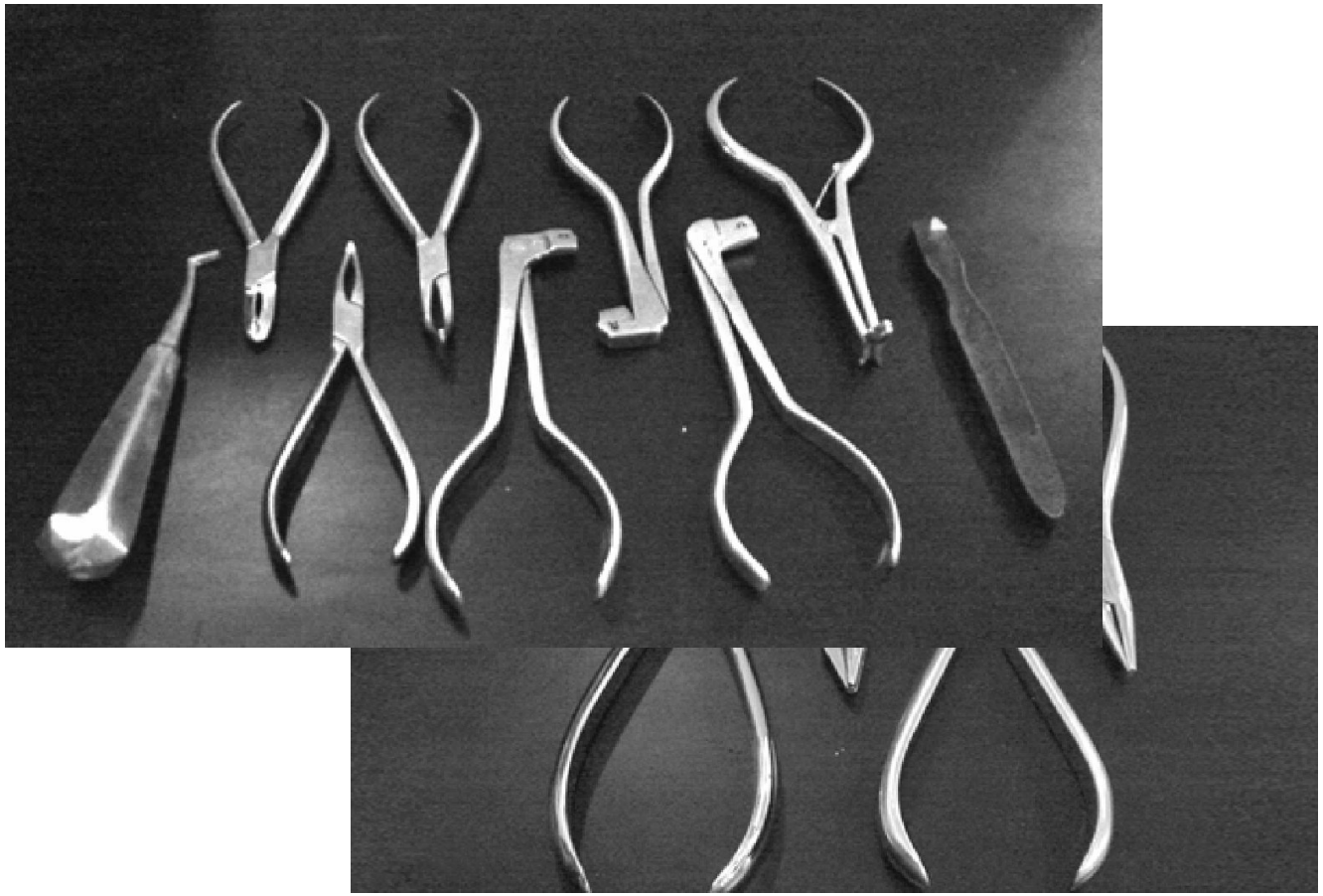
- Elaborate instrumentation and skills required
- Banded tooth is more prone to caries and decalcification
- Supraeruption of opposing tooth.

Fabrication

- Band construction
- Taking the impression and cast preparation
- Loop fabrication
- Soldering
- Polishing
- Cementation

Armamentarium

- Stainless steel band material or preformed bands
- Pliers — contouring pliers, band forming pliers, band seater or pusher, band adapter, hoe pliers straight and curved, band cutting scissors, bird beak pliers, crimping pliers, three pronged pliers, universal pliers.
- Stainless steel wires (round)
- Spot welding unit, soldering unit, silver solder, fl ux
- Wire cutter
- Finishing burs, polishing stones.



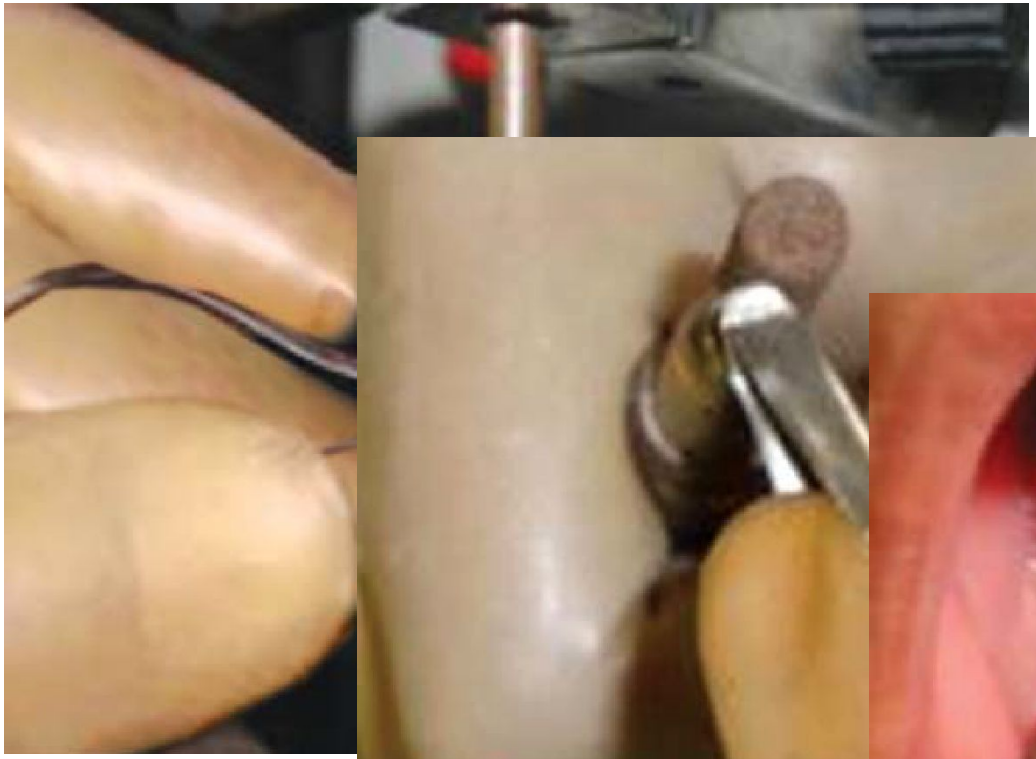
BAND CONSTRUCTION

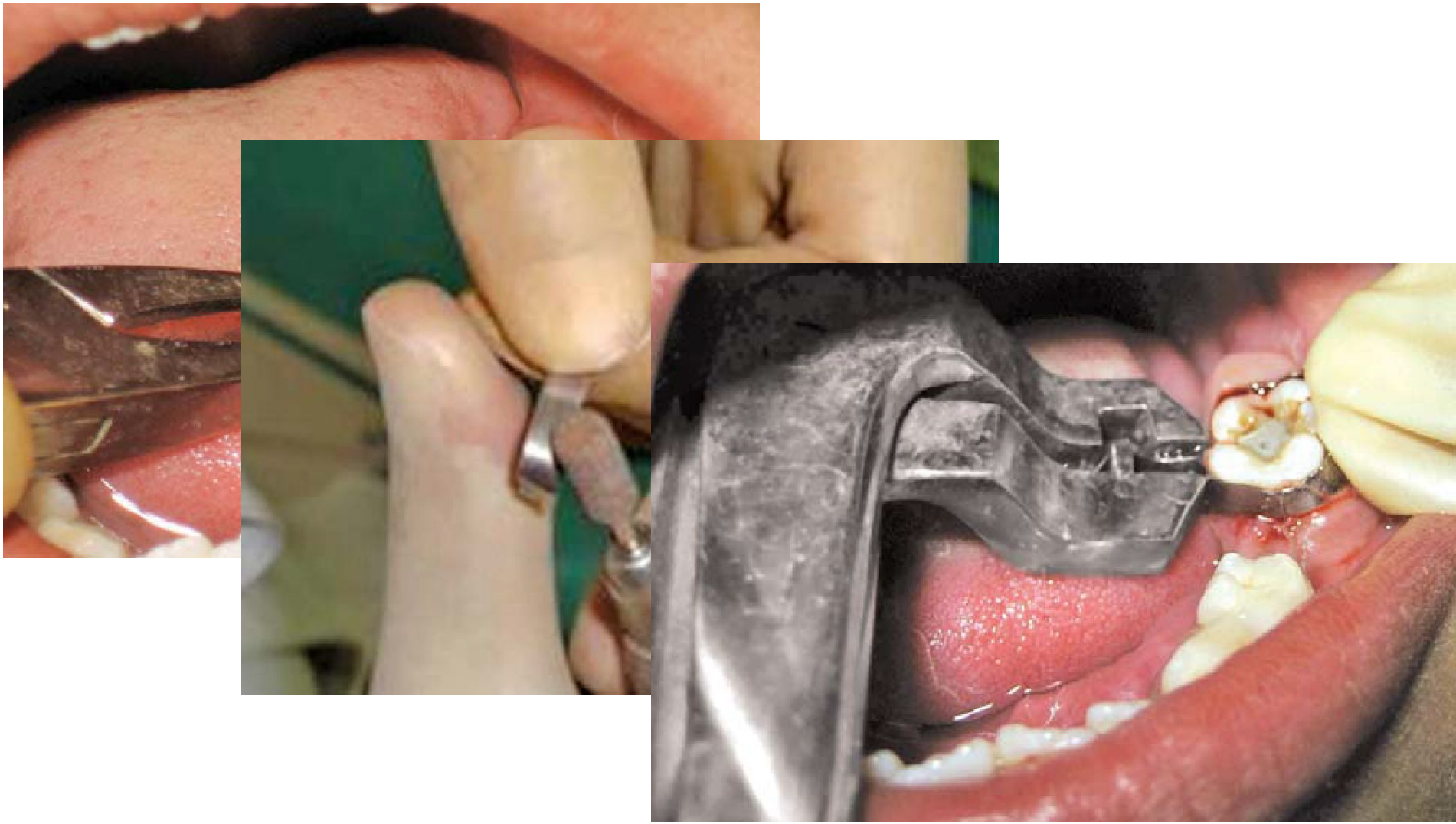
According to Fabrication

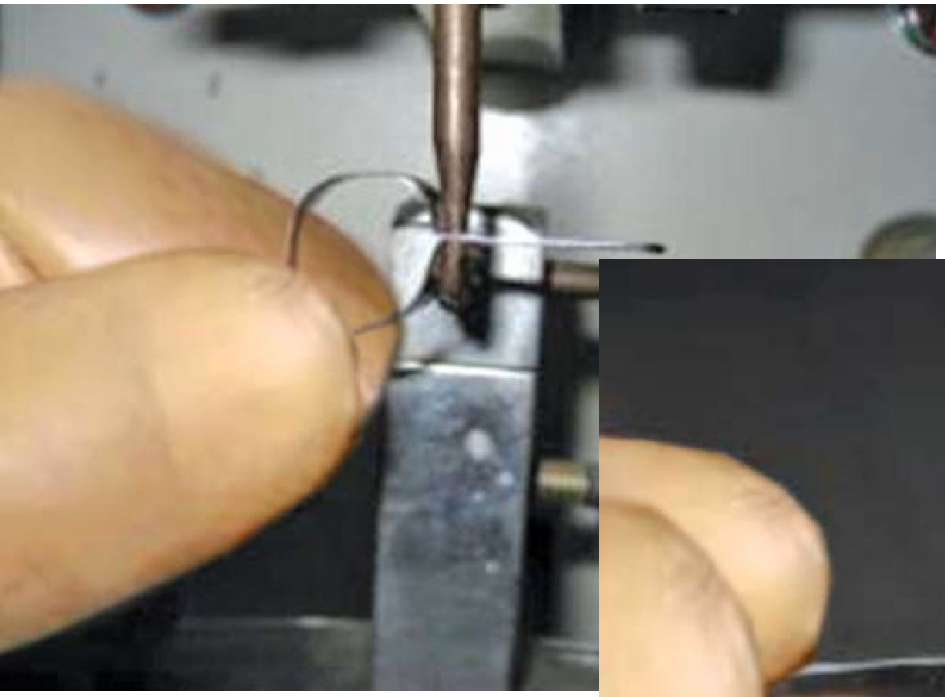
- *Loop bands*
  - Precious metal (first introduced by Johnson)
  - Chrome alloy bands.
- *Tailored bands*
  - Precious metal
  - Chrome alloy.
- *Preformed seamless bands*

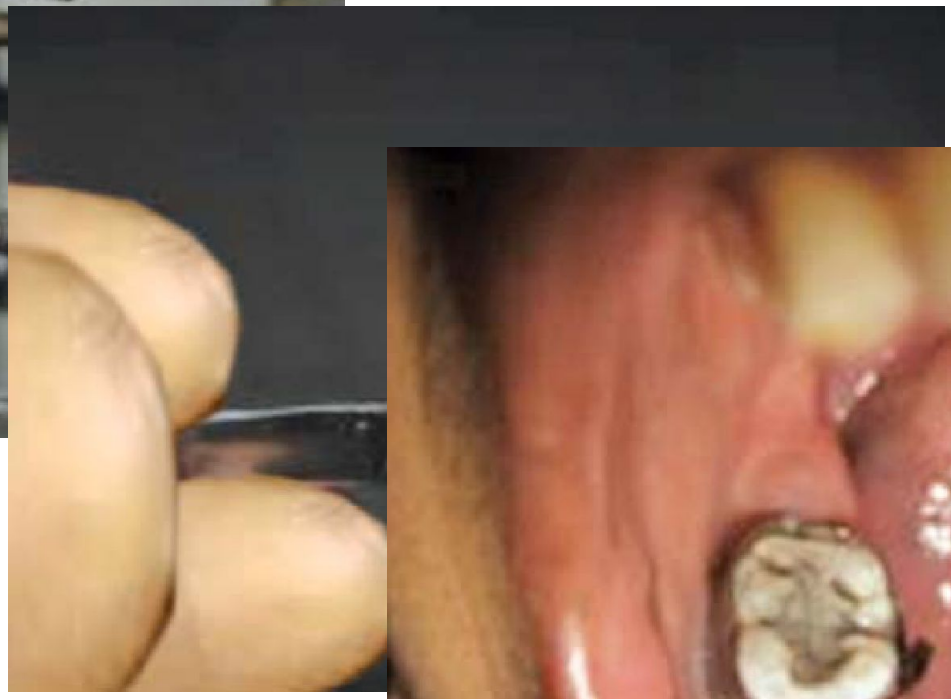
According to Band Material

- *Anterior teeth*: 0.003 × 0.125 × 2 inches
- *Bicuspids*: 0.004 × 0.150 × 2 inches
- *Primary molars*: 0.005 × 0.180 × 2 inches
- *Permanent molars*: 0.006 × 0.180 × 2 inches.

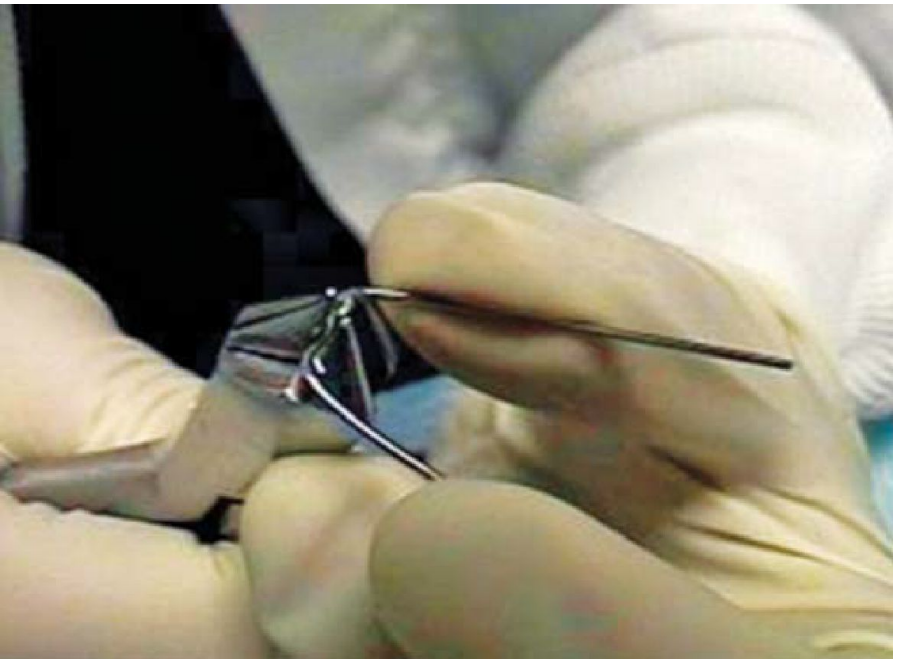


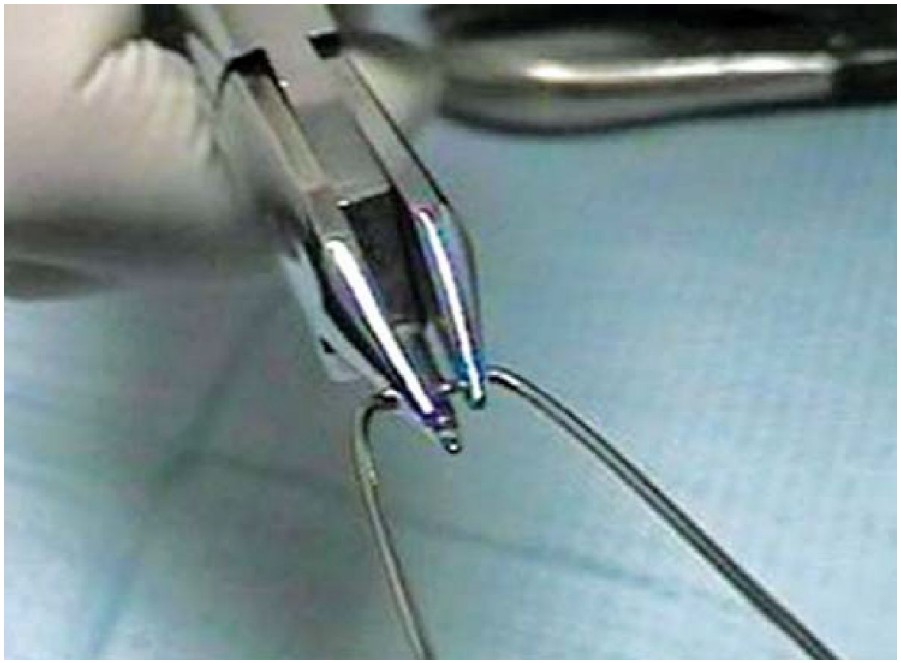


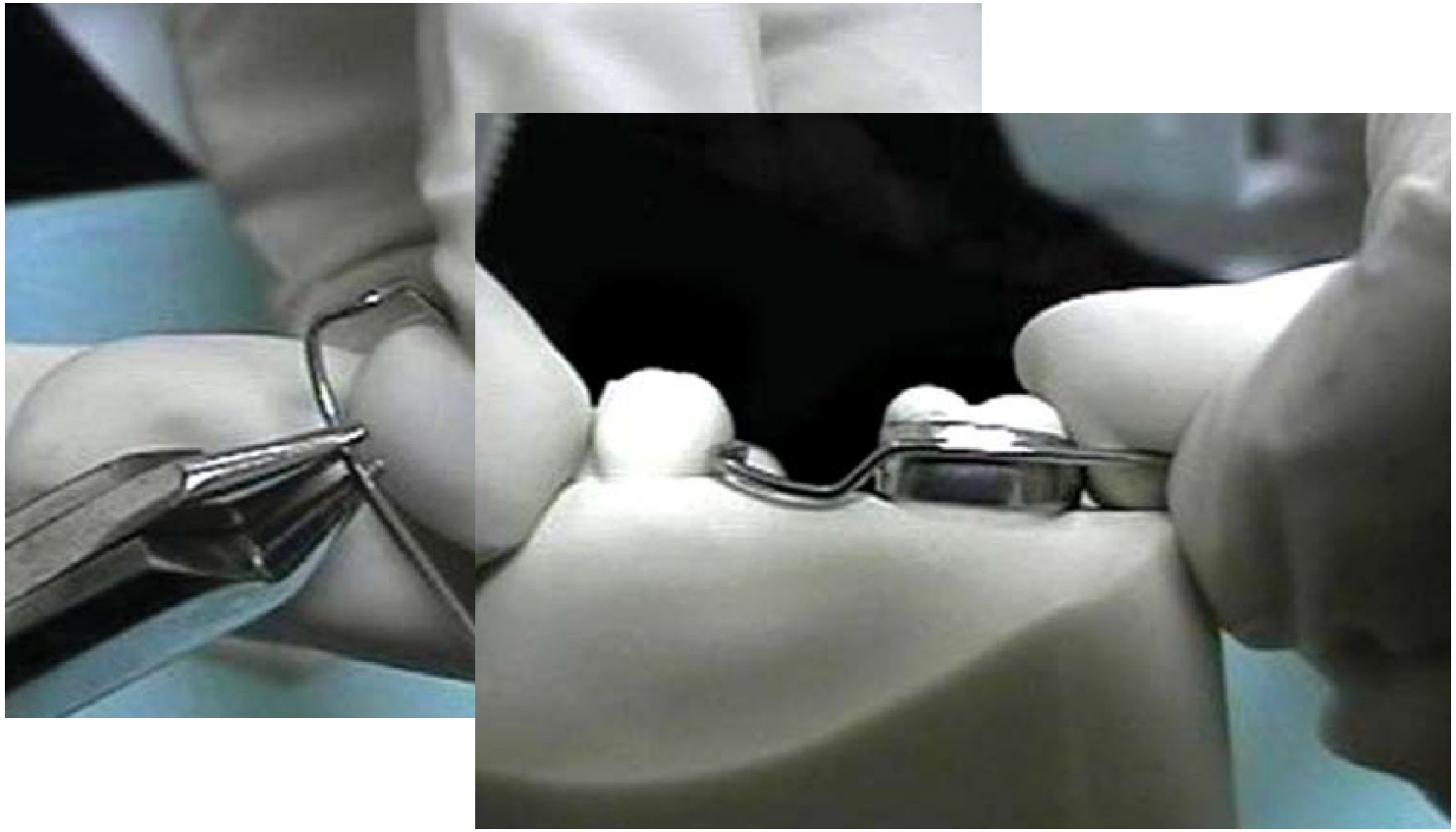




LOOP FABRICATION







BAND & LOOP

- unilateral, non-functional, passive, fixed

Indications

- It is usually indicated for preserving the space created by the premature loss of single primary molar.
- Bilateral loss of single primary molar before eruption of permanent incisors. This is because the developing succedaneous tooth buds are placed lingually to permanent incisors so other space maintainers like lingual arch can lead to obstruction of these teeth.
- It is also indicated when 2nd primary molar is lost after the eruption of 1st permanent molar.

Advantages

- Construction is easy and faster
- Few appointments by patient
- Many modifi cations are possible.

Disadvantages

- Cannot stabilize the arch
- Non-functional
- Slippage of loop by masticatory forces
- Cannot be used for multiple loss of teeth
- Most of the time primary 2nd molar (E) is lost before eruption of premolar.

Modifications

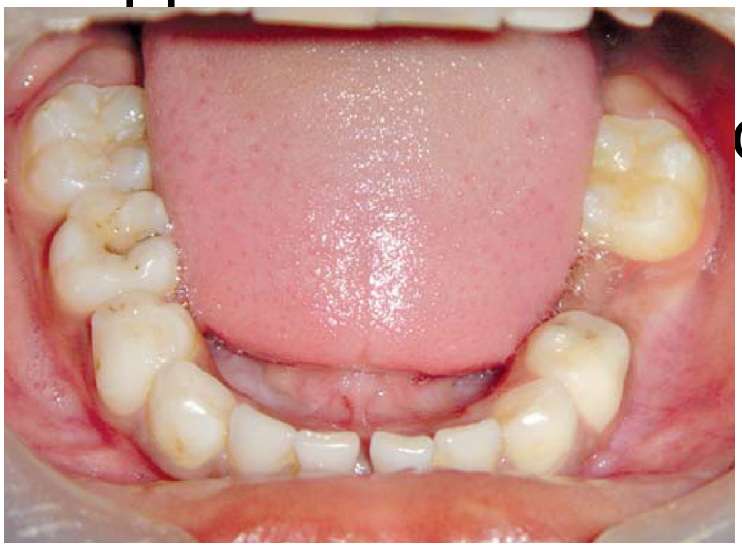
- *Robert Rapp and Isik Demiroz (1983):* Stoppers can be used to prevent gingival as well as buccal movements of loop.

- *Crown and loop:* Same as band and loop but a stainless steel crown is used on abutment tooth instead of a band

- *Crown-band and loop:* Stainless steel crown is first placed on abutment tooth and then it is banded

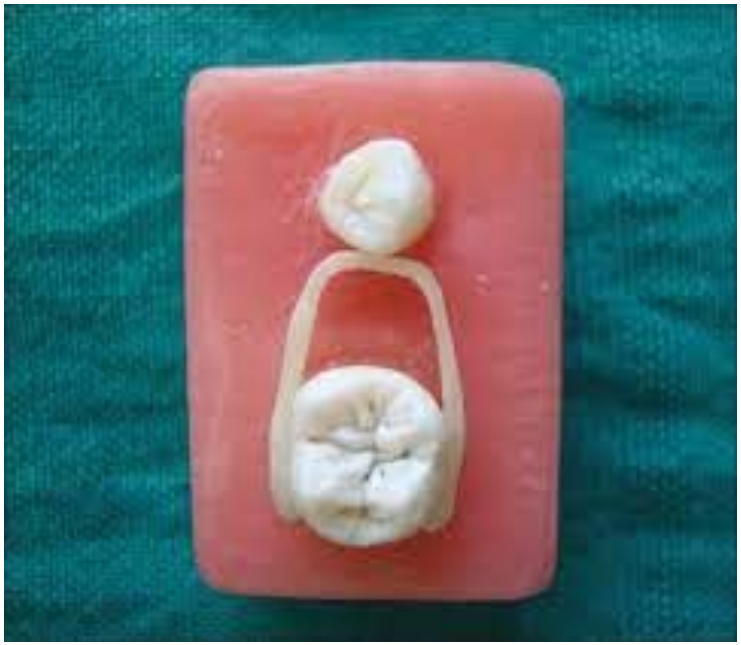
- *Meyne's space maintainer:* Band and loop but the loo

- *Reverse band and loop:* Given when there is premature loss of primary 2nd molar and the permanent molars have not erupted fully to support a band. In such cases primary 1st molar is ma dge of



- *Band and bar:* Prevents eruption of premolar

- Bonded band and loop



- Long band and loop

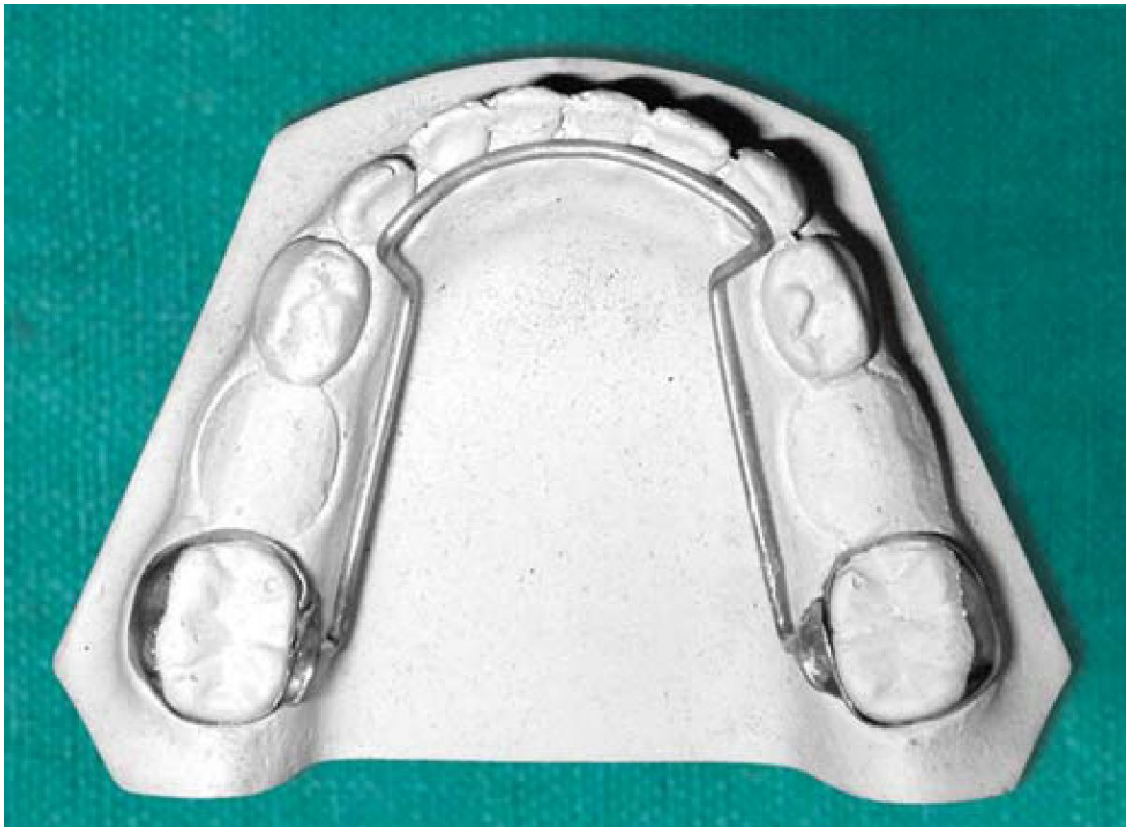
LINGUAL ARCH SPACE MAINTAINER

- bilateral, non-functional, passive/active, mandibular fixed appliance

Indication

- The appliance is usually indicated to preserve the space created by multiple loss of primary molars when there is no loss of space in the arch. Th e use of the lingual arch is a good preventive measure, since it helps in maintaining the arch perimeter by preventing both mesial drifting and lingual movement of the molar teeth and also lingual collapse of the anterior teeth.
- Bilateral loss of primary molars after eruption of lower lateral incisors.
- Unilateral loss of primary molars after eruption of lowerlateral incisors.
- Minor space regaining.

Design of the Wire Loop



Advantages

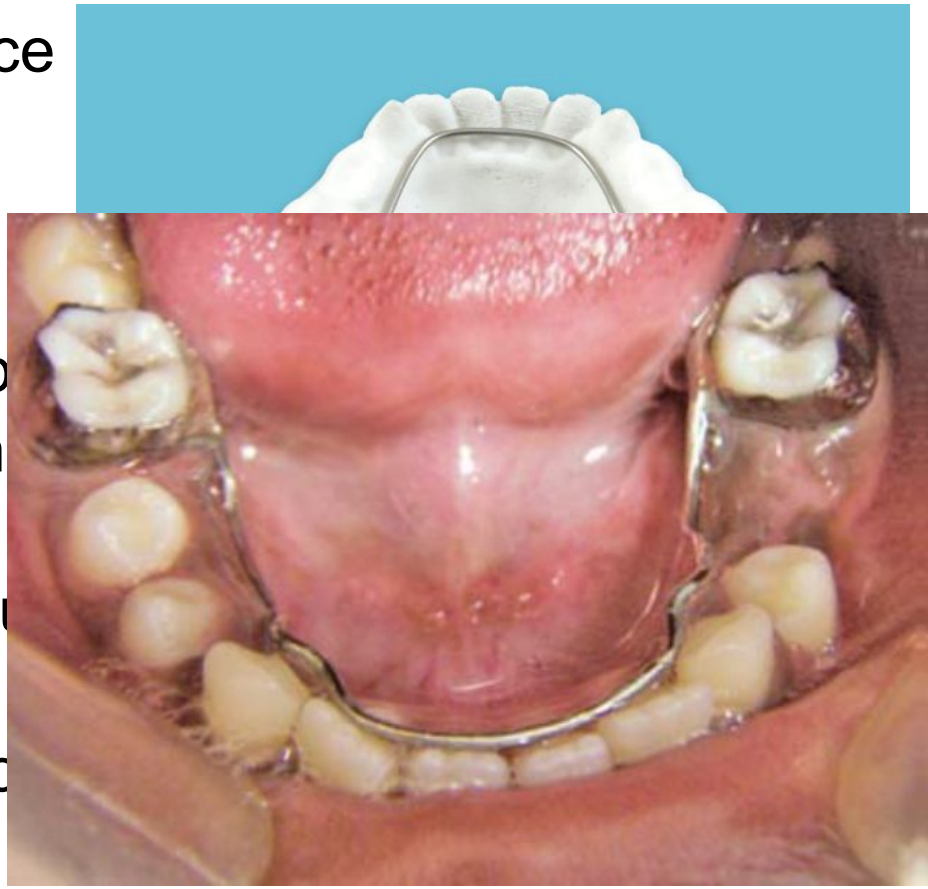
- Many modifi cations are possible
- Can also be used to regain space
- Arch holding space maintainer.

Disadvantages

- Construction is diffi cult
- More chances of distortion of ap
- May cause unwanted movemen

Modifications

- Hotz lingual arch — with U-loop
- Removable lingual arch
- Omega bends — in canine regio



NANCE PALATAL ARCH SPACE MAINTAINER

- Bilateral, non-functional, passive, maxillary fixed appliance
- **Indications**
- Nance palatal arch may be used in maintaining the maxillary 1st permanent molar positioning when there is bilateral premature loss of primary teeth with no loss of space in arch and a favorable mixed dentition analysis.

Advantages

Arch stabilizing.

Disadvantages

- May cause tissue hyperplasia
- Irritation to palatal tissues
- Pressure effects
- Cannot be used in patients allergic to acrylic.

Modifications

Modified Nance appliance for unilateral molar distalization

TRANSPALATAL ARCH

- Unilateral, non-functional, passive, maxillary fixed appliance

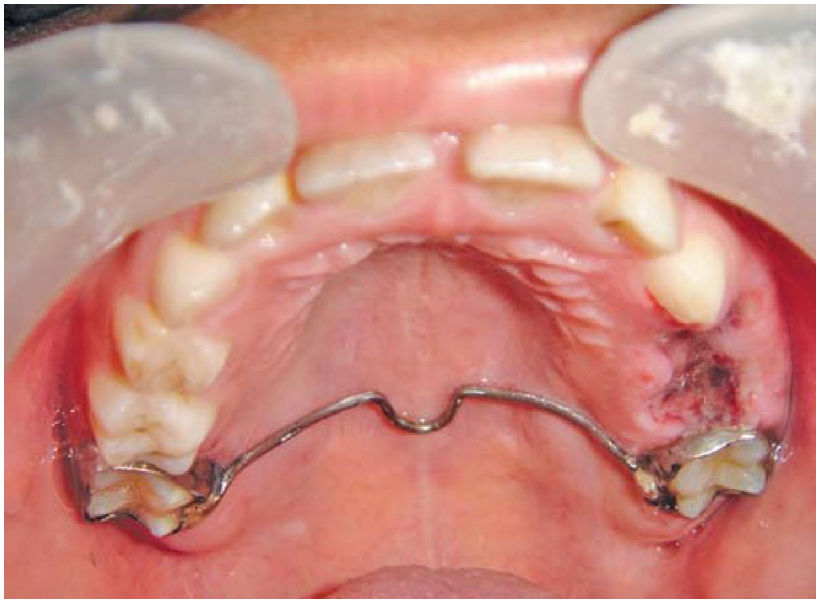
Indications:

- It is best indicated when one side is intact, and several primary teeth of the other side are missing.
- Also indicated when primary molars are lost bilaterally
- Designed to prevent the molars from rotation

Advantages: It stabilizes the maxillary first permanent molars when primary molars require extraction

Disadvantages: Rotation of molars

Both molars may tip together.



DISTAL SHOE SPACE MAINTAINER

- Intra-osseous space maintainer. Roche's appliance
- Indications: When the second primary molar is extracted or lost before the eruption of 1st permanent molar.
- Contraindications

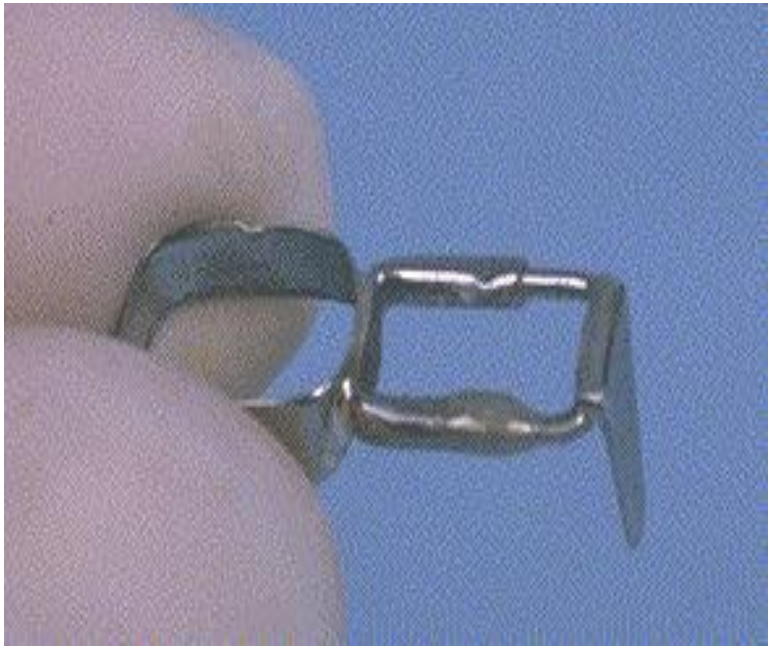
- Inadequate abutments due to multiple losses of teeth.
- Poor oral hygiene
- Lack of parent and patient cooperation.
- Medically compromised patients like patients with congenital heart disease, kidney problems, juvenile diabetes, history of rheumatic fever, generalized debilitation and haemophiliacs.
- Congenitally missing 1st permanent molar.

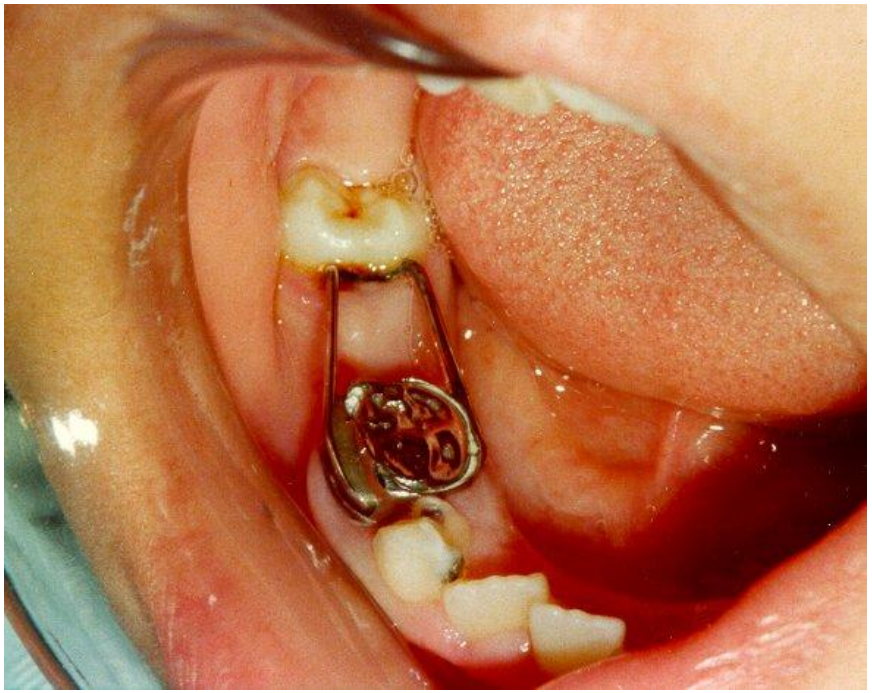
Fabrication:

- The first primary molar is used as an abutment.
- It is prepared to receive a stainless steel crown, carefully contoured and cemented.
- A band is placed over the steel crown on the abutment tooth.
- A compound impression is made ,the band is removed and placed in the impression and a stone model is poured.
- If the second primary molar has not been extracted then it is cut off the model.
- A hole that simulates the distal root of the tooth is made by a bur in the model.

- **If the second primary molar is absent then the positioning of the tissue extent is decided with the help of dividers and a bite wing radiograph.**
- **If the corresponding second primary molar is present then the correct mesiodistal width can be measured from it. the tissue bearing loop is next contoured with a 0.040-inch wire extending distally and into the prepared opening on the model.**
- **The free ends of the loop are soldered onto the band**
- **The V of the tissue extension is filled with soldered 0.040 inch wire.**

- **A knife edge is formed at the apex of the V if the extraction site has already healed. If the appliance is delivered at the time of extraction then the edge of the V is just polished .**
- **Before the final placement of the appliance a radiograph is taken with the appliance to determine if the tissue extension is in proper relation with the unerupted first permanent molar.**
- **The depth of the intragingival extension should be about 1 to 1.5mm below the mesial marginal ridge of the molar or just touch the mesial surface as it erupts and moves forward**





Advantages

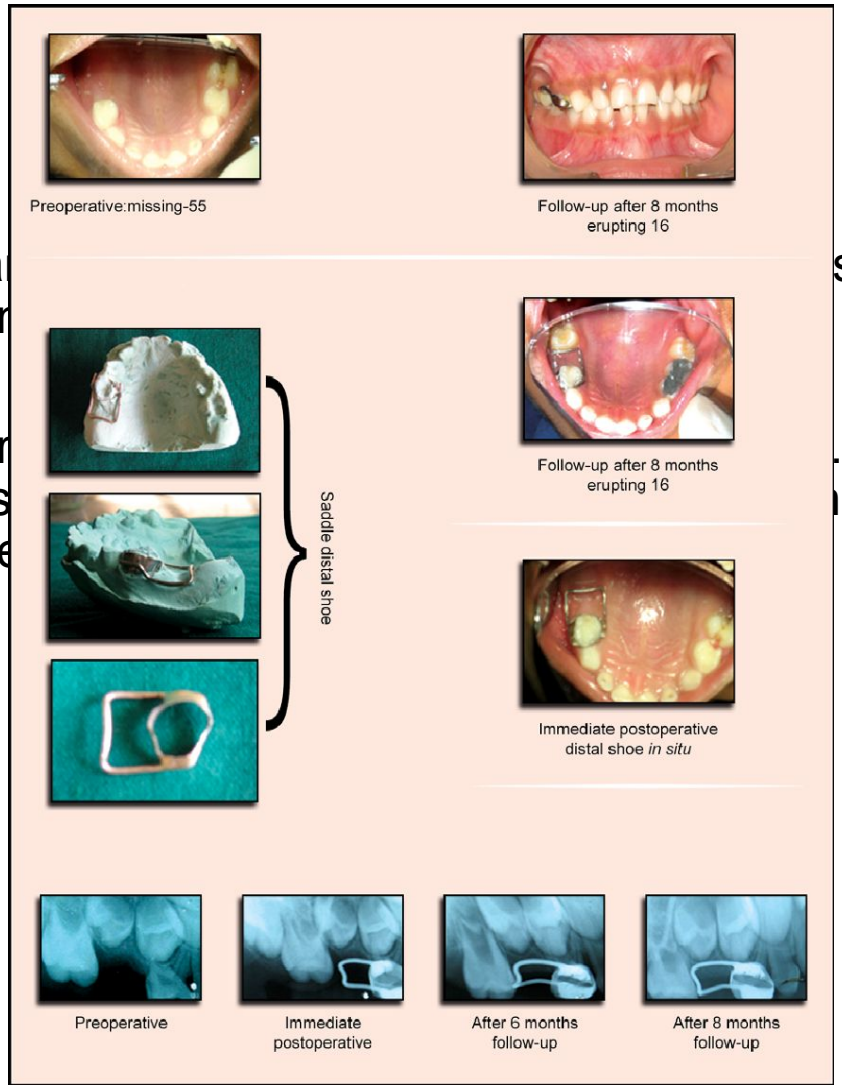
- Only space maintainer, which can be used if there is premature loss of primary 2nd molar before eruption of permanent molars.

Disadvantages

- Can cause deviation of permanent tooth bud
- May permit tipping if not placed properly
- Interfere with epithelialization of socket
- Can cause infection
- Can only be used in specific patients
- Retention is not good
- Construction is difficult.

Controversy

- Placing loops in the horizontal a… s will permit the precise adjustmer… molar.
- Space maintainer is placed after… . Vertical extension is short and is… es the mesial surface of erupting pe…
- Gingival saddle appliance



RECENT ADVANCES

Fig 2: CAD-CAM Band and loop space maintainer

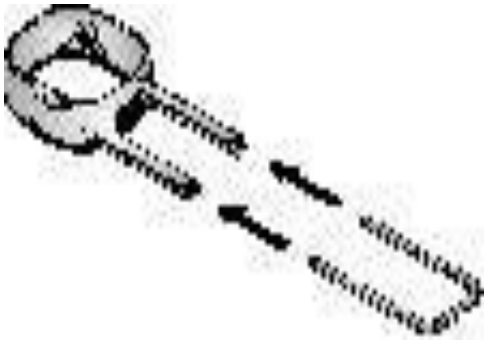
Fig 4: Functional Band and Loop space maintainer

CHAIRSIDE SPACE MAINTAINER SYSTEM

- The Unitek Corporation offered the Gerber Space Maintainer system in the 1960's. Developed by Dr. Warren Gerber,
- This system provided the first chair side fabrication of space maintainers available.

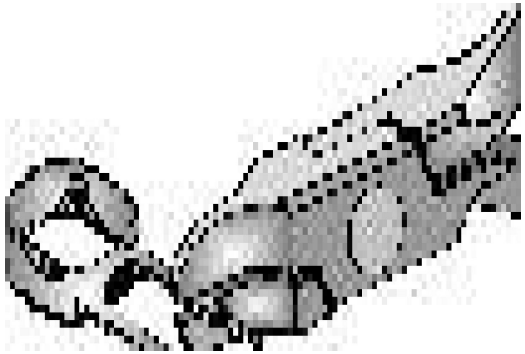
TECHNIQUE

- **Step 1) Select the correct size band or crown and trial fit to tooth. Bands should fit the tooth tightly. A properly seated band will be difficult to dislodge or push gingivally. Do not apply pressure to the space maintainer (tube section).**



- Step 2) Insert maintainer wire into tube and trial fit assembly in mouth .NOTE: There are two width sizes for wires; narrow and wide. Wide wires go on the larger size bands and crowns. Check that wire width matches the tube width. Slide wire to desired length. If the wire is too long ,trim the wire with a DENOVO Wire Shear. In applications involving very small spaces, the tube may need to be trimmed as well (we recommend using a diamond disk for cutting the tube) .Use a marker or file to mark the wire where it enters the tube. Unseat the band and remove the appliance.

- Step 3) Using the Tube Crimping Plier, crimp both tubes firmly, making sure tube is crimping on the inserted wire. Check appliance for stability. Wire should not move



- Step 4) Re-seat appliance on tooth. The entire appliance should be free of occlusal contact with the opposing arch. Cement band or crown. A properly crimped space maintainer device will hold the space securely for the life of the appliance. As with any dental appliance, patient must be informed not to chew on hard or sticky candy, ice, etc.

Fig 3: Tube and Loop Space Maintainer

Fig 5: EZ space maintainer

Functional Space Maintainers

(A) Examine the patient and check occlusion

(B) Prepare the abutment teeth for steel crowns

(C) Adapt steel crowns to the abutment teeth

(D) Compound impression of the quadrant with the crowns in mouth

Place the crowns in the compound and secure when necessary before pouring the model

(E) Solder pontic to abutment teeth and polish space maintainer

(F) Crimp pontic where necessary fill with self curing acrylic and cement into place

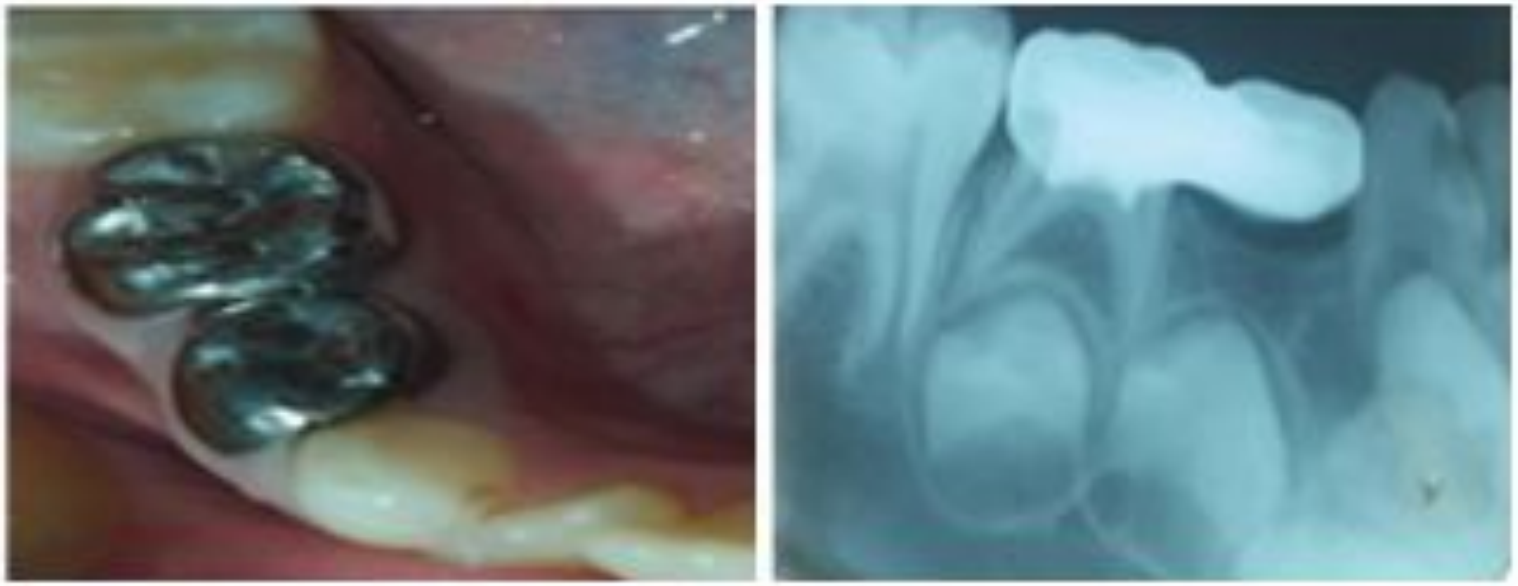


Fig 6: Pontic Crown Fixed Space Maintainer

Dir
Abu

Double abutment

(A) Examine the patient and check occlusion

(B) Prepare the abutment teeth for Asteel crowns

(C) Adapt steel crowns to the butment teeth

(D) Spot weld a two centimeter piece of 0.030 Blue elgiloy wire to the buccal, occlusal, gingival middle third of the distal stainless steel crown molar

(E) Bend wire to conform to the curve of the arch and cross the buccal middle third of canine

Mark where the wire crosses the canine with a wax pencil
Use pencil marks to relate wire to canine on the welder and spot weld the wire to the canine crown

Try in the stainless crowns with wire to check fit

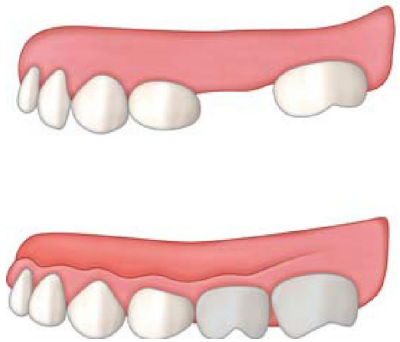
(F) Select pontic to fil space, trim as necessary, relate to wire and mark with wax pencil
Spot weld pontic to wire. Try in space maintainer

Take another piace of two centimeter piece of 0.030 blue elgiloy wire and pot weld it to the lingual faces of all three stainless steel crowns

After trying in the space maintainer and checking the fit solder all the welded areas and polish

(G) Crimp pontic where necessary fill with self curing acrylic cement into place

Direct technique Cantilever type



(A) Cantilever

Examine the patient and check occlusion

No preparation is required because a first permanent molar is used. Adapt stainless steel crown and crimp as necessary

Select a stainless steel crown as a pontic and spot weld one half centimeter piece of 0.030 Blue elgiloy wire to the mesial surface, then bend at a right angle to make occlusal rest on 1st primary molar

(B) Cut off excess wire

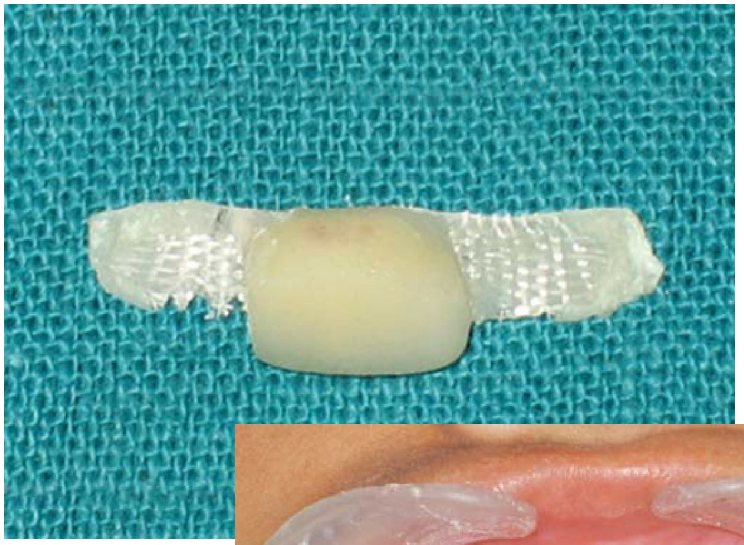
(C) Relate pontic to stainless steel crown abutment and mark with pencil

Orient stainless steel crown abutment and pontic on spot welder with pencil marks. Weld and try in space maintainer

Solder wire occlusal rest to pontic and to abutment crown and polish

(D) Crimp pontic where necessary fill with self curing acrylic and cement into place

Fixed anterior aesthetic space



Removable Space Maintainer

Classification of RemovableSpace Maintainers

Brauer classifi ed removable dentures for children as follows:

- Class 1: Unilateral maxillary posterior.
- Class 2: Unilateral mandibular posterior.
- Class 3: Bilateral maxillary posterior.
- Class 4: Bilateral mandibular posterior.
- Class 5: Bilateral maxillary anterior posterior.
- Class 6: Bilateral mandibular anterior posterior.
- Class 7: One or more primary of permanent anterior.
- Class 8: Complete primary

Indications

- Esthetics is of importance.
- Th e abutment teeth cannot support a fi xed appliance.
- A cleft palate patient.
- Child has reached a mental age of 2½ years.
- Permanent teeth are not fully erupted for adaptation of bands.
- Multiple loss of deciduous tooth.

Contraindications

- Lack of patient parent cooperation.
- It the child has not attained a mental age of 2½ years.
- It the patients are allergic to acrylic materials.
- Epileptic patients.
- Children with possible caries activity.

- **Advantages of Removable Space Maintainers**
- Easy to clean and permit maintenance of proper oral hygiene.
- Restore vertical dimension.
- Help in mastication.
- Post insertion check up is easy.
- Stimulate eruption of underlying tooth.
- Band construction and elaborate skills and instrumentation are not required.
- Alterations can be made without changing the appliance.

Disadvantages of Removable Space Maintainers

- May be lost or broken by the patient.
- Cannot be used in uncooperative patients.
- Patient may not wear them.
- Lateral jaw growth may be hampered.
- May cause irritation and allergy to underlying tissues





INTERCEPTIVE ORTHODONTICS

- Introduction

Definition

- American Association of Orthodontists defined Interceptive orthodontics as "*That phase of the science and art of orthodontics employed to recognize and eliminate potential irregularities and malpositions in the developing dentofacial complex".*
- According to **Graber**, Interceptive orthodontics refers to the "*Measures undertaken to intercept a malocclusion that has already developed or is developing, and the goal is to restore a normal function".*
- According to **Ackerman** and **Proffit** (1980), Interceptive orthodontics can be defined as, "*Elimination of existing interferences with the key factors involved in the development of the dentition"*

Procedures undertaken in interceptive orthodontics

- ***Serial extraction***
- ***Correction of developing cross bite***
- ***Control of abnormal habits***
- ***Space regaining***
- ***Muscle exercises***
- ***Interception of skeletal malrelation***
- ***Removal of soft tissue or bony barrier to enable eruption of teeth***

Serial Extraction

- **Serial extraction** *can be defined as the correctly timed removal of certain deciduous and permanent teeth in mixed dentition cases with dentoalveolar disproportion in order to alleviate crowding of incisor teeth; allow unerupted teeth to guide themselves into improved positions; lessen (or eliminate) the period of active appliance therapy.*

Serial extraction

History: Robert Bunon (1743)was the first to describe serial extraction.

Kjellgren coined the term ‘ serial extraction’ Nance is considered as the father of serial extraction in the USA.

Other pioneers have been : Hotz, Tweed, Dewel and Jack Dale.

PRINCIPLES OF SERIAL EXTRACTION

Arch Length : Tooth Material Discrepancy

Physiologic Tooth Movement

INDICATIONS

- Premature loss of deciduous teeth
- Arch length deficiency and tooth size discrepancy
- Absence of physiologic spacing
- Lingual eruption of lateral incisors
- Unilateral deciduous canine loss and midline shifting
- Canines erupting mesial to the lateral incisors
- Mesial drift of buccal segment
- Abnormal eruption direction and eruption sequence

- Gingival recession on labially displaced incisors
- Flaring, ectopic eruption, ankylosis, etc.
- Abnormal or asymmetric primary canine root resorption
- Crowded maxillary and mandibular incisors with extreme labial proclination
- Deleterious oral habits
- Class I malocclusion showing harmony between skeletal and muscular system.

CONTRAINDICATION

- Congenitally absent/missing lower 2nd premolars
- Extensive caries of permanent 1st molars
- Severe class II and III malocclusions of dental as well as skeletal origin
- Unilateral congenital absence of teeth
- Abnormal tooth size, shape, color, etc.
- Cleft lip and cleft palate cases

- Reverse overjet, deep bite, open bite, rotation, gross malposition, cross bite, etc.
- Spaced dentition
- Class I malocclusions with minimal space deficiency
- Mild disproportion between arch length and tooth material that can be treated by proximal stripping.

ADVANTAGES

- Treatment is more physiologic as it involves guidance of teeth into normal positions making use of the physiologic forces.
- The removal of deciduous canine allows spontaneous alignment of crowded incisors which simplify later appliance treatment.
- The extraction of 1st premolar before crowding allows permanent canines to drift into natural alignment without any appliance.
- It lessens the period of future appliance therapy and cost of treatment.
- Psychological trauma associated with malocclusion can be avoided by treatment of the malocclusion at an early age.
- Better oral hygiene is possible thereby reducing the risk of caries.
- Health of investing tissues is preserved.
- Lesser retention period is indicated at the completion of treatment.

Disadvantages

- This procedure cannot be applied in Class II and III malocclusion cases. It is avoided in Class II division 2. Serial extraction may cause an increase in overbite.
- *Psychological trauma:* It is unpleasant for a child to have four teeth extracted each time or at three or four occasions.
- If extractions are carried out too early this result in space loss or delayed eruption of permanent successors.
- Lower permanent canines may erupt ahead of 1st premolar into extraction space of the first deciduous molar, impacting premolar and making its removal difficult.
- Quite frequently patients require appliance treatment.
- There is no single approach that can be universally applied to all patients. Each patient has to be assessed and a suitable extraction time table planned.
- Treatment time is prolonged as the treatment is carried out in stages spread over 2 to 3 years.
- It requires the patient to visit the dentist often
- Thus patient cooperation is needed.
- As extraction spaces are created that close gradually, the patient has a tendency of developing tongue thrust.
- Ditching or space can exist between the canine and 2nd premolar.

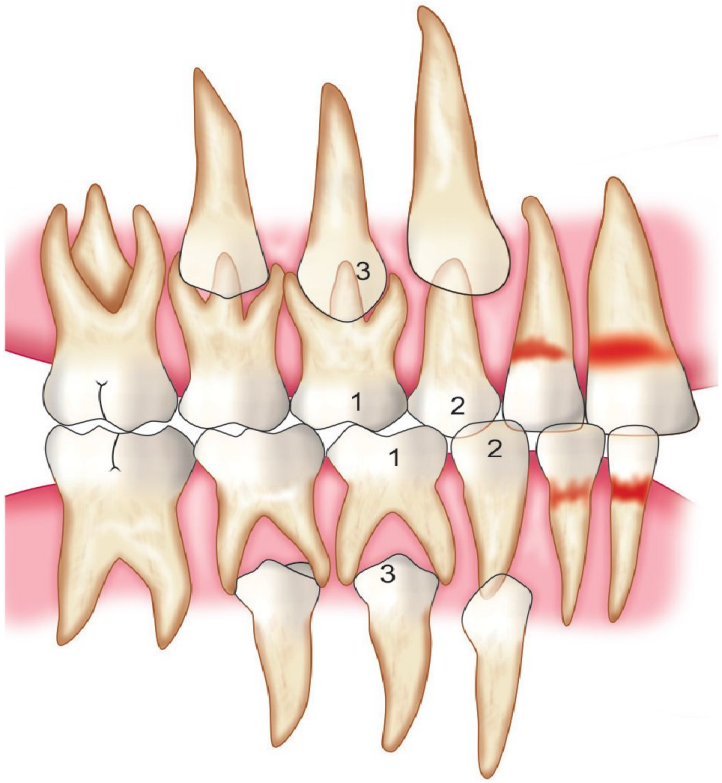
Diagnosis for an ideal case

- Cephalometric analysis
- Arch discrepancy model analysis

Methods:

- Nance method
- Tweed method
- Dewel method

TWEED METHOD -1966



Tweed's technique

↓

At 8 years

↓

All 1st deciduous molars are extracted

↓

Manitain the deciduous canine to retard the eruption of permanent canines

↓

After 4 to 10 months

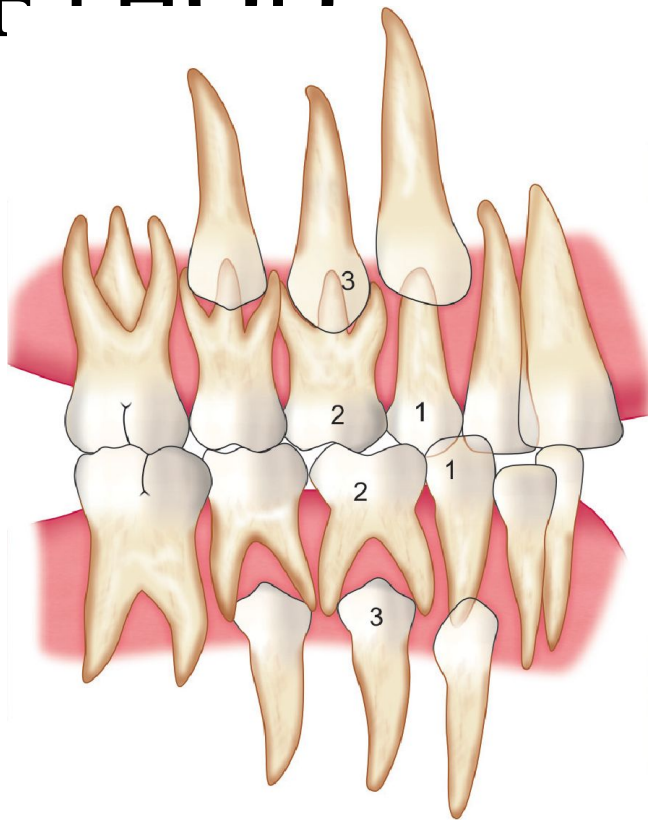
↓

Extract all four erupting 1st premolar teeth along with all four deciduous canines

↓

Canines and incisors are aligned

DEWEL METHOD



Dewel's method

↓

At 8–9 years of age

↓

Deciduous canines are extracted

↓

After 1 year

↓

Deciduous 1st molars are extracted

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Eruption of 1st premolars is accelerated

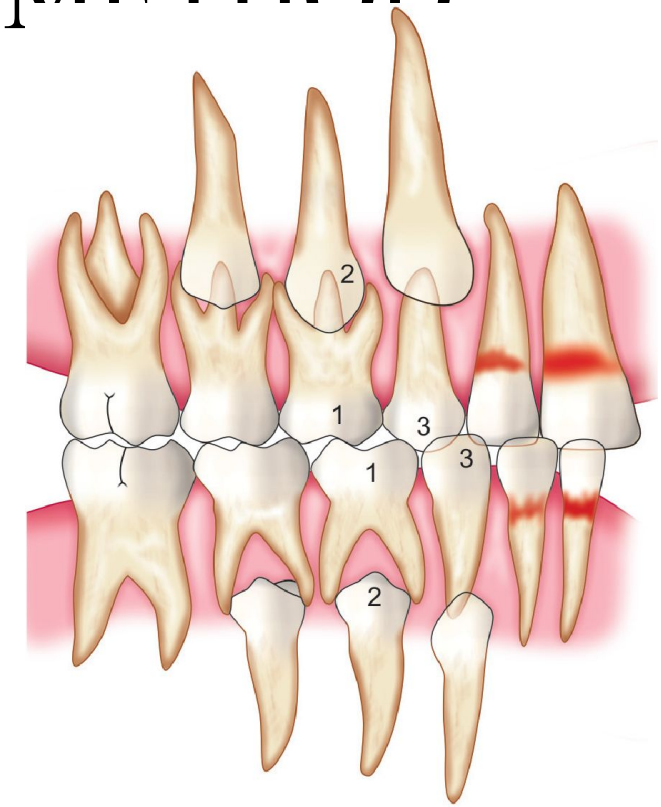
↓

Extraction of the erupting 1st premolars

↓

Canines erupt in alignment

NANCE METHOD



Nance method

↓

Extraction of the deciduous first molars

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Extraction of the 1st premolars

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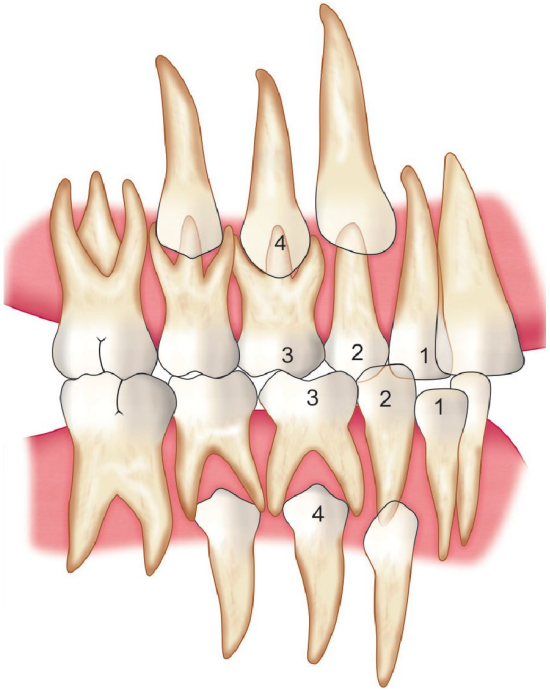
Extraction of deciduous canines

↓

Canines erupt in alignment

MOYER's METHOD



Moyer method

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Extract all deciduous lateral incisors

↓

Wait for 7–8 months

↓

Extract all deciduous canines

↓

Extract all deciduous 1st molars

↓

Extract all 1st premolars

↓

Provide space and align canines

SPACE REGAINERS

- Space regainers are used to regain the space lost by drift of teeth
- Extra-oral or intra oral appliances are used

Indications:

One or more primary teeth has been lost.

Some amount of space loss has occurred due to drifting of the adjacent teeth

SPACE REGAINING

- Loss of arch perimeter usually is the result of caries or premature loss of primary teeth.
- The most frequent cause of arch perimeter loss in the mixed dentition is caries of the primary molars.
- A carious lesion on the distal surface of the second primary molar, in particular allows the first permanent molar to tip mesially.
- Usually when several primary teeth are lost, the arch perimeter is shortened and space regaining is indicated.

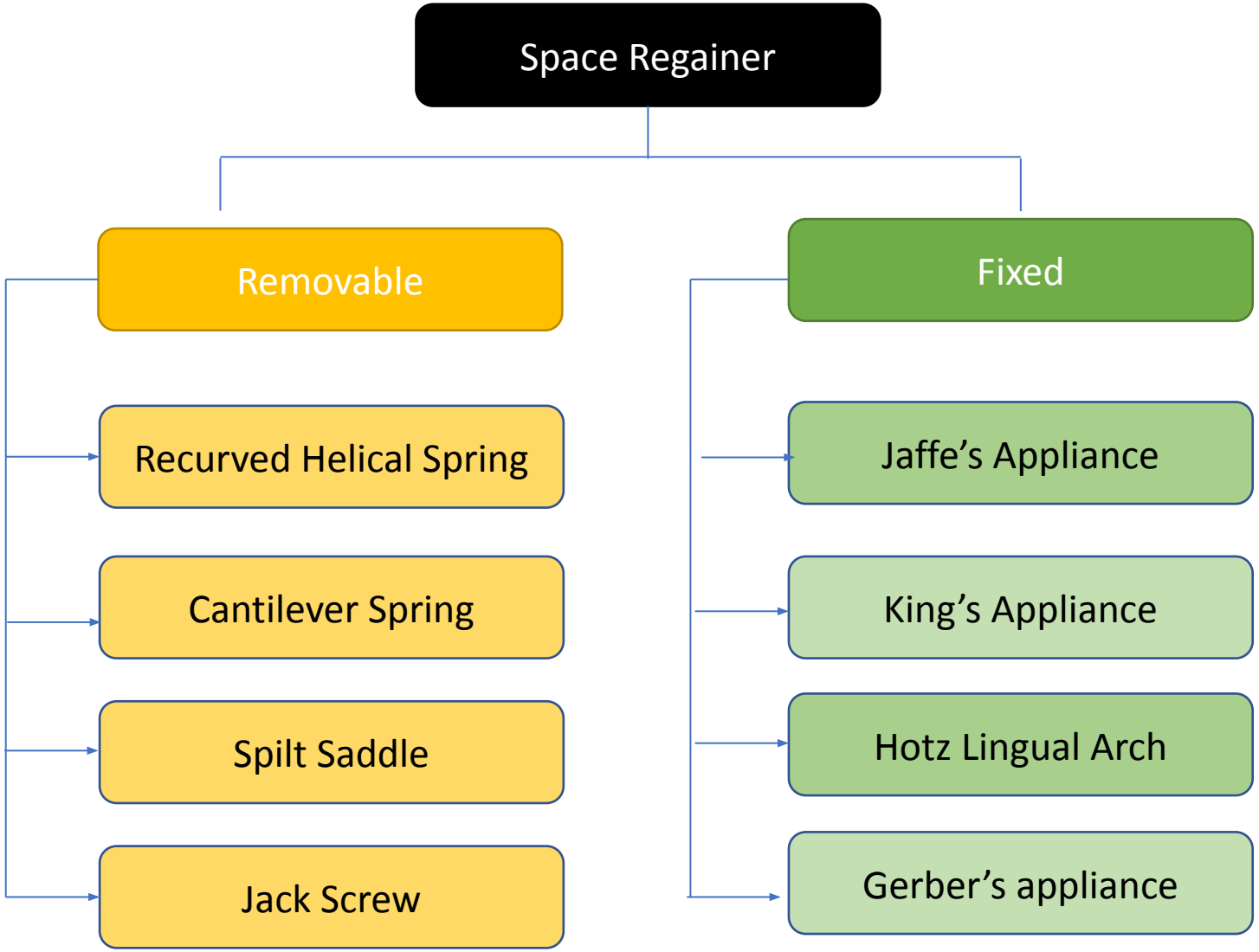
- After locating where the arch has shortened, lost space is determined by means of mixed dentition analysis.

- The exact amount of space that must be regained and the most logical tooth movements to recover that space also kept in mind before selecting space regainer.

Factors to be kept in mind while selecting space regainer

1. easy in design
2. no need of proper purchase point all time
3. all kind of movements is not possible. so more than one appliance may be needed.

- The timing of space regaining is important, since the position and stage of development of the second permanent molar often is a limiting factor.
- A fully developed 2nd permanent molar hampers space regaining.


Space Regainer
Removable
Fixed
Recurved Helical Spring
Cantilever Spring
Spilt Saddle
Jack Screw
Jaffe’s Appliance
King’s Appliance
Hotz Lingual Arch
Gerber’s appliance

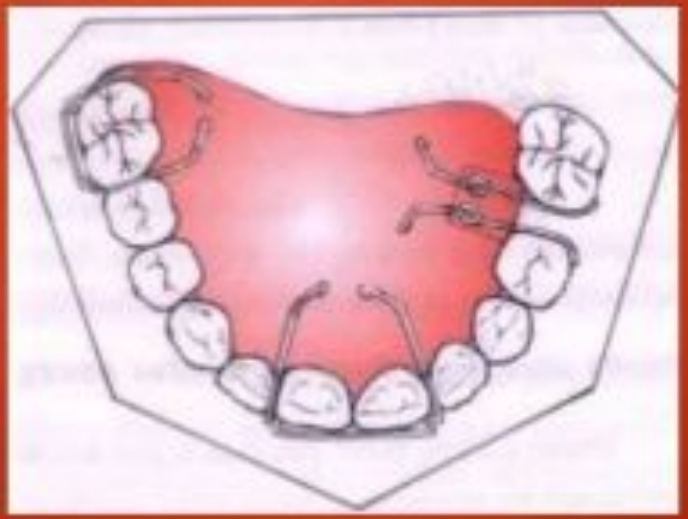
RECURVED HELICAL SPRING

- The upper or lower hawley appliance with recurved helical spring against the mesial surface of a molar that has drifted forward is effective in molar distalization.
- A removable appliance retained with Adams' Clasps and incorporating a helical fingerspring adjacent to the tooth to be moved is very effective.

- This appliance is the ideal design for tipping one molar.
- One posterior tooth can be moved upto 3mm distally during 3 to 4 months of full time appliance wear.
- The spring is activated approximately 2mm to produce 1mm of movement per month

CANTILEVER SPRING

- The molar can be distalized to regain space by using removable appliances that incorporate simple finger springs.



SPLIT SADDLE ARCYLIC SPACE REGAINER

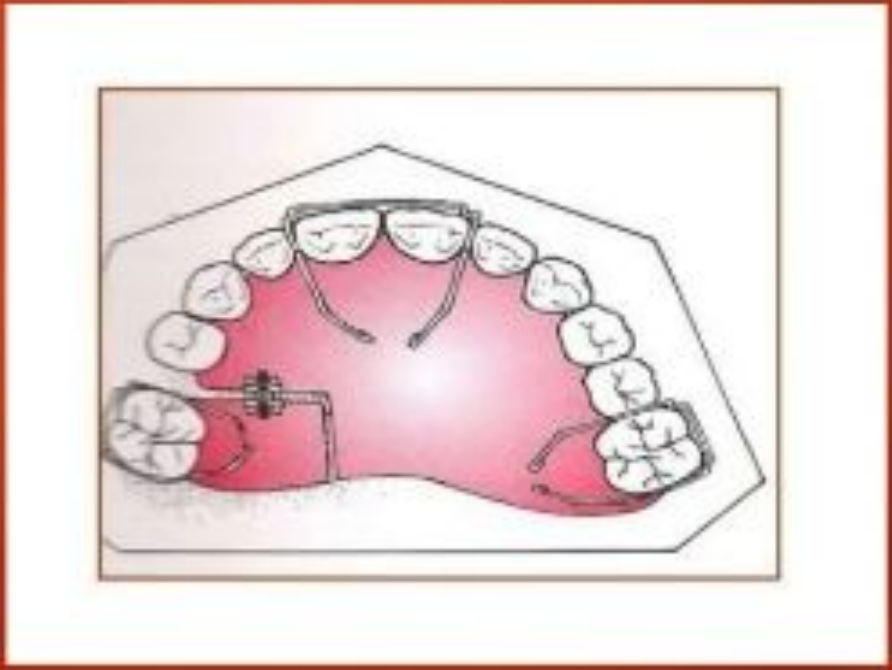
- Useful when greater distances must be regained. As the molar moves distally, the appliance becomes more fragile

SLINGSHOT REGAINER

- A light elastic is joined to buccal and lingual hooks .

JACK SCREW

- Space regaining can be brought about using jack screws placed in such a way that an increase in arch length is obtained by distalization of the molar.



Jaffe appliance

- An appliance for certain minor tooth movements was described by Jaffe (1963), is useful when the presence of ankylosed tooth, early loss of a deciduous molar or an extraction result in filling of adjacent segments into proximal dental area.

- Movement is obtained by the use of light spring pressure against a sliding section or arch.

- The appliance consists of buccal and lingual arms of molar bands and the sliding arch to move the desired tooth or teeth.

Kings appliance (1977)

- An edgewise bracket is spot-welded to the buccal surface of the primary molar band, and the completed anchorage unit is cemented in place.

- A band with an angulated buccal tube is cemented on the malpositioned molar, and a straight section of wire with an open coil spring is introduced into the buccal tube and ligated into the bracket.

- The anchorage unit for the mandibular arch is basically a fixed lingual arch with bands fitted on the first deciduous molar of the treatment side and the first permanent molar on the opposite side.

- A millimeter a month is satisfactory progress in the repositioning of first molar.

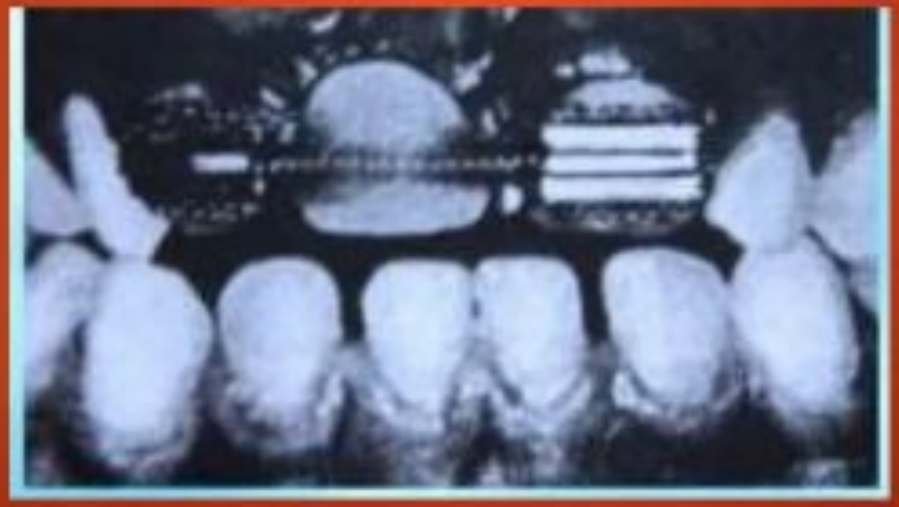
Hotz lingual arch

GERBER SPACE REGAINER

- An orthodontic band or a crown is selected for the tooth to be distalized.
- This space regainer consists of a 'U' shaped hollow tubing and a 'U' shaped rod that enters the tubing.
- The tube is soldered or welded on the mesial aspect of the first molar to be moved distally

Anterior space regainer

- Standard labial tubes are bonded
- .014" wire inserted into Lateral incisor tube,
- An open coil Spring passed through central incisor tube.



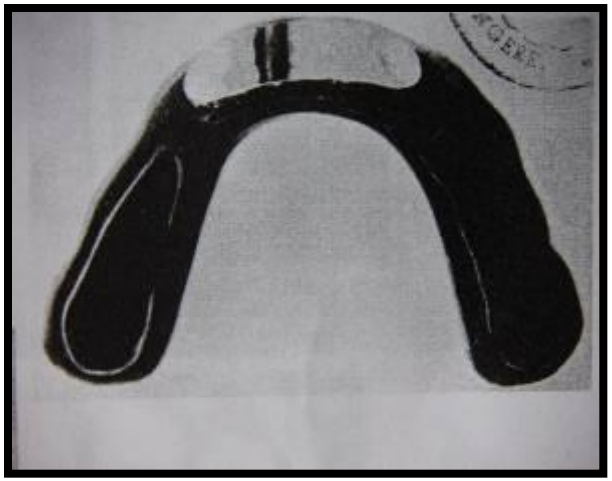
Correction of Developing Anterior Crossbite

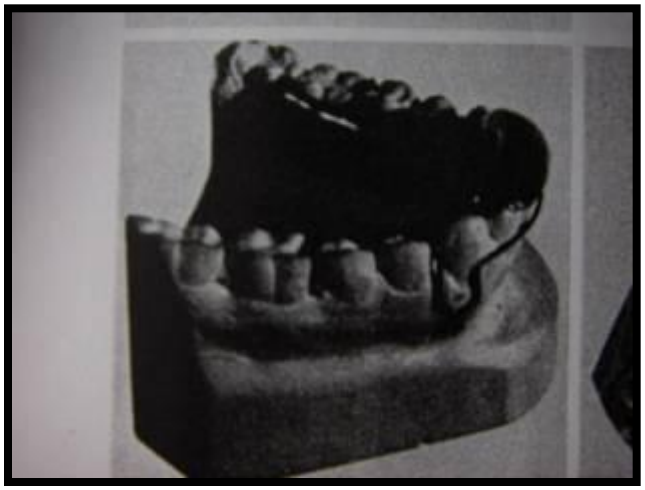
- Anterior crossbite: A malocclusion in which one or more of the upper anterior teeth occlude lingually to the mandibular incisors; the lingual malpositions of one or more maxillary anterior teeth in relation to the mandibular anterior teeth when the teeth are in centric occlusion.

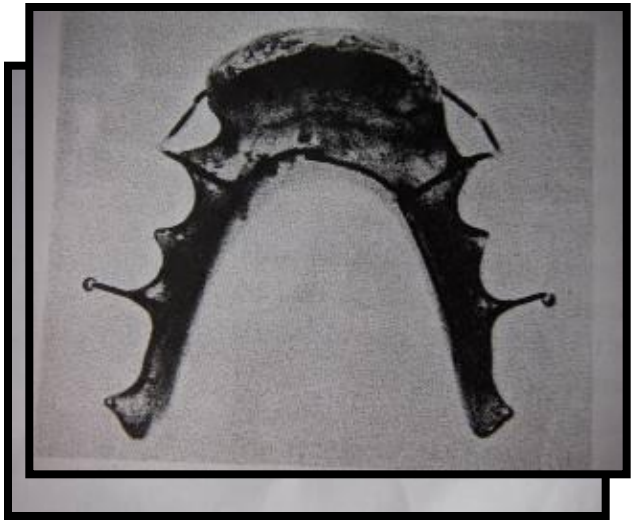
Treatment of Anterior Cross-bite

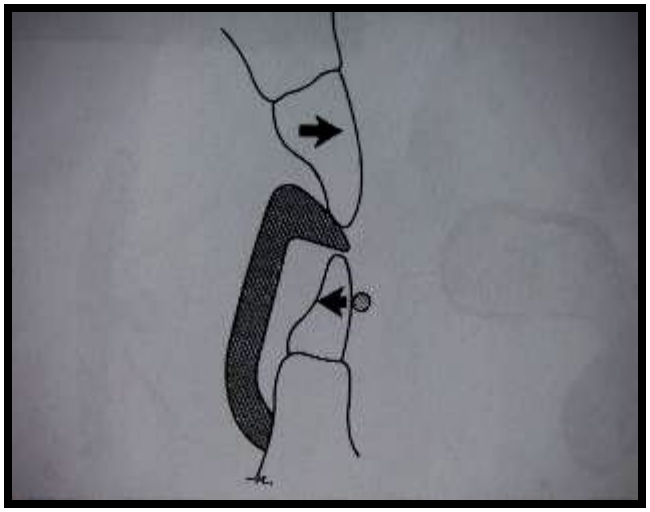
- Those that deliver rapid-heavy-intermittent forces
- Those that deliver slow-light-continuous forces
- Those that may correct skeletal problems in growing patients

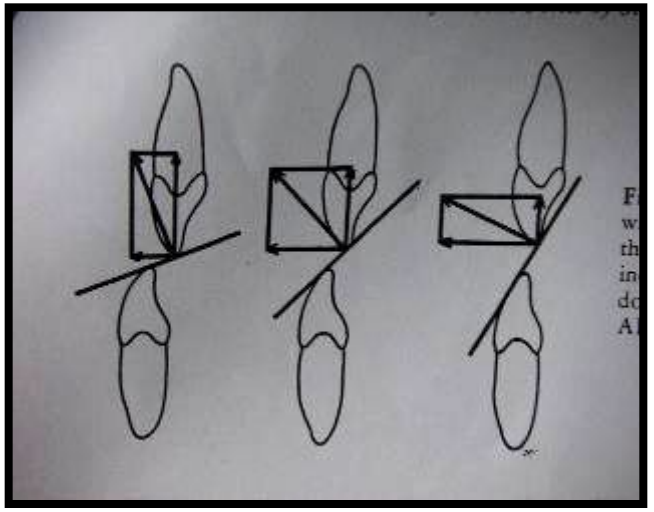
- Those that deliver rapid-heavy-intermittent forces
  - FIXED INCLINED BITE PLANES
    - Constructed of acrylic
    - Placed onto the mandibular incisors
    - Treat lingually locked maxillary incisors
    - Do not require patient compliance
    - May open the bite, create a temporary speech defect, or traumatize the dentition
  - No significant long-term side effects.









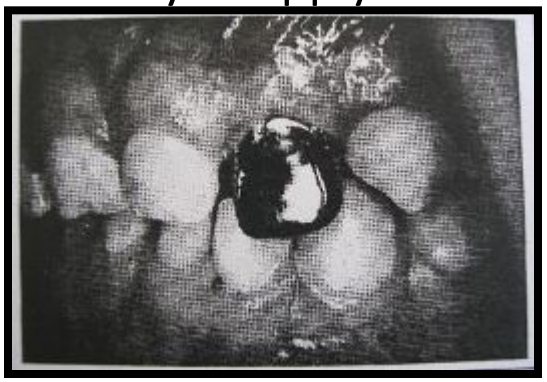


TONGUE BLADES

- Usually employed as a follow up to treatment with inclined plane
- Simplest
- Works best if the bite is normal and the involved tooth is newly erupting
- Patient is instructed to bite on the wood incline with a constant pressure and simultaneously exert a slight but constant pressure with his or her hand on the blade
- Must be done for one to two hours a day for period of one to two weeks
- Highly unpredictable results because require patient compliance

REVERSED STAINLESS STEEL CROWNS

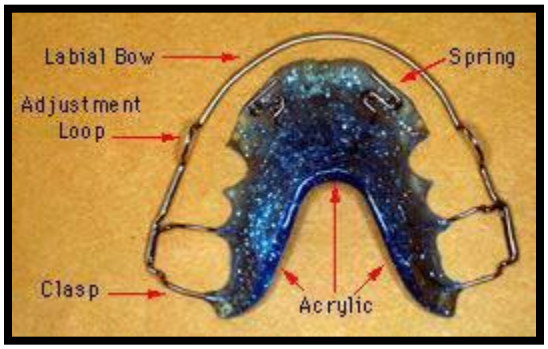
- Anterior stainless steel crowns cemented backwards on the maxillary teeth
- Stainless steel crown needs to open the bite 2 to 3 mm and establish at least a 25 percent overbite for successful treatment
- If they worsen or fail to treat the crossbite, add crown may be used in combination with an inclined bite plate
- Independent of patient compliance and easy to apply
- Reduced costs
- May appear unesthetic



Those that deliver slow-light-continuous forces

REMOVABLE: HAWLEY RETAINER WITH AUXILIARY SPRINGS

- The most frequently used
- Acrylic palatal coverage and wire clasps
- The auxilliary or Z springs activated
- The acrylic can be extended to create posterior bite plates
- Patient compliance is key to successful treatment.



ANTERIOR CROSSBITE WITH EXPANSION

Upper schwarz expansion appliance with posterior coverage and a spring

Other Interceptive methods

- **Control of Abnormal Habits**
- **Muscle Exercises**
- **Interception of Skeletal Mal-relations**
- **Removal of Soft Tissue and Bony Barriers**