

# ISOLATION AND GINGIVAL TISSUE MANAGEMENT



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Direct methods

Rubber Dam

Indirect methods

Gingival Tissue management

Biologic width

# CONTENTS

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# INTRODUCTION

Any operative procedure necessitates the need for adequate control over the operating field.

Proper moisture control, good accessibility and visibility as well as adequate room for instrumentation around the working area are necessary for easy manipulation and insertion of restorative materials.

## Isolation

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graph TD; A[Isolation] --> B[Isolation from Moisture]; A --> C[Isolation from soft tissues];
```

Isolation from Moisture

Isolation from soft tissues

- Applies use of mouth mirrors, cheek retractors, rubber dam, gingival displacement agents

# Isolation from Moisture

## Direct Methods

Rubber dam

Cotton rolls and cotton roll holder

Gauze pieces

Absorbent wafers

Suction devices

Gingival retraction cord

## Indirect Methods

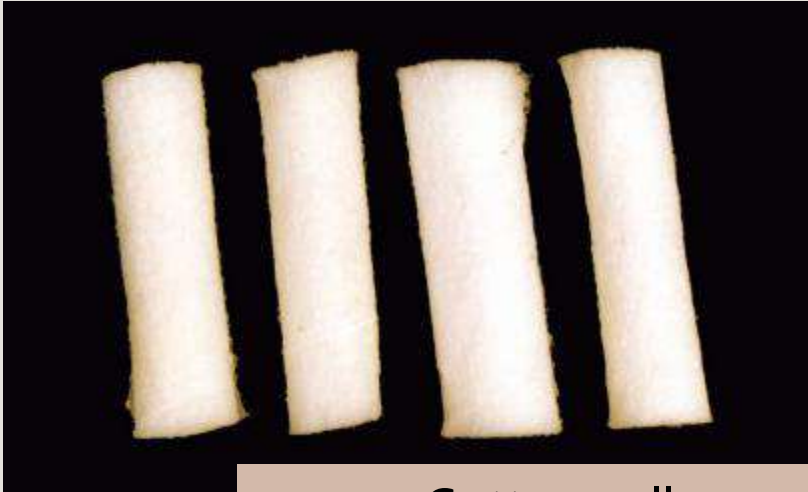
Comfortable position of the patient and relaxed surroundings

Anti sialogogues

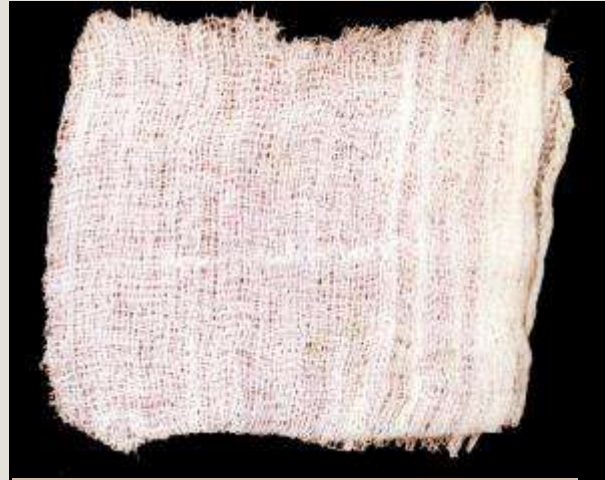
Anti anxiety drugs

Local Anaesthetics

# DIRECT METHODS



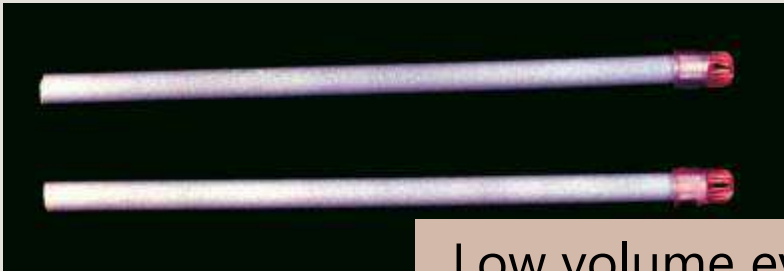
Cotton rolls



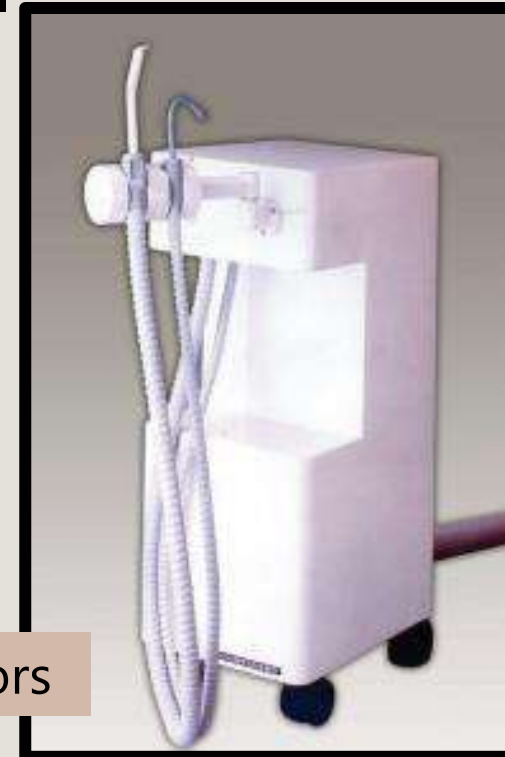
Gauze Pieces



Absorbent cellulose wafers/ pads



Low volume evacuators/  
Disposable plastic suction tips



High volume evacuators



Cotton holding forceps



Cotton holders



# RUBBER DAM



Rubber dam sheets

Available in  
different size and  
thickness:

Size: 5" × 5" or 6"  
× 6" square

Thickness: Thin –  
0.0063" Medium  
– 0.008"

Heavy – 0.010"

Extra heavy –  
0.012"

Special heavy –  
0.014"

# RUBBER DAM SHEETS

SIZE	APPLICATION
5"x 5" inches	Endodontic procedures Treatment involving anterior teeth Pediatric purposes
6"x 6" inches	Adult operative procedures

THICKNESS	APPLICATION
Heavy (0.01" ± 0.02")	Restorative treatment Multiple teeth isolation
Medium (0.008" ± 0.002")	Endodontic procedures
Thin (0.006" ± 0.002")	Mandibular anterior teeth Partially erupted teeth

# RUBBER DAM SHEETS

COLOUR OF SHEET	APPLICATION
Green	Endodontic/ Restorative procedures Photography
Blue	Restorative procedures Photography
Black	For enamel fillings
Transparent	Endodontic procedures

# RUBBER DAM CLAMPS



Rubber dam clamps/ Retainers

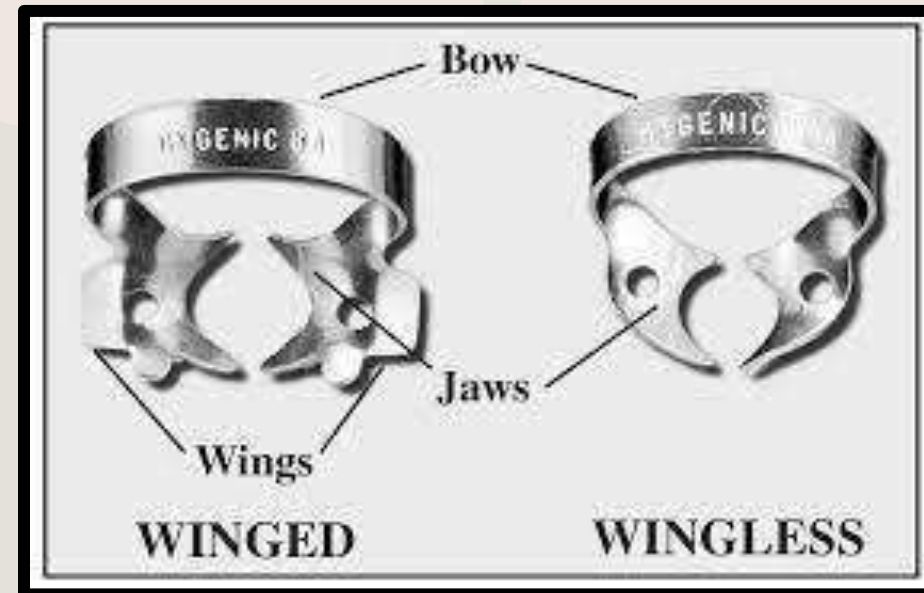
Certain retainers have prongs that are inverted, i.e. directed gingivally

Convenient to use on partially erupted teeth or when additional soft tissue needs to be retracted.

## Two types of clamps

**Winged retainers:**  
Wing like projections that provide extra retraction

**Wingless retainers:**  
No wings are present. The clamps are placed first and then the rubber dam is stretched over the clamps.





- 9- Universal double bowed Anterior clamp
- 2 A- Universal Maxillary Bicuspid clamp

- 12 A- Right Mandibular molar clamp (serrated jaws)
- 14 A- Molar clamp for partially erupted or irregularly shaped teeth
- 8 A- Molar clamp (For Pediatric purpose) For irregularly or partially erupted teeth
- 13 A-Left Mandibular Molar clamp with serrated jaws
- 4- Small Maxillary Molar clamp
- 2- Universal Mandibular Bicuspid clamp
- 7- Universal Mandibular Molar clamp

# HU FRIEDY RUBBER DAM CLAMPS

## FOR ANTERIOR TEETH



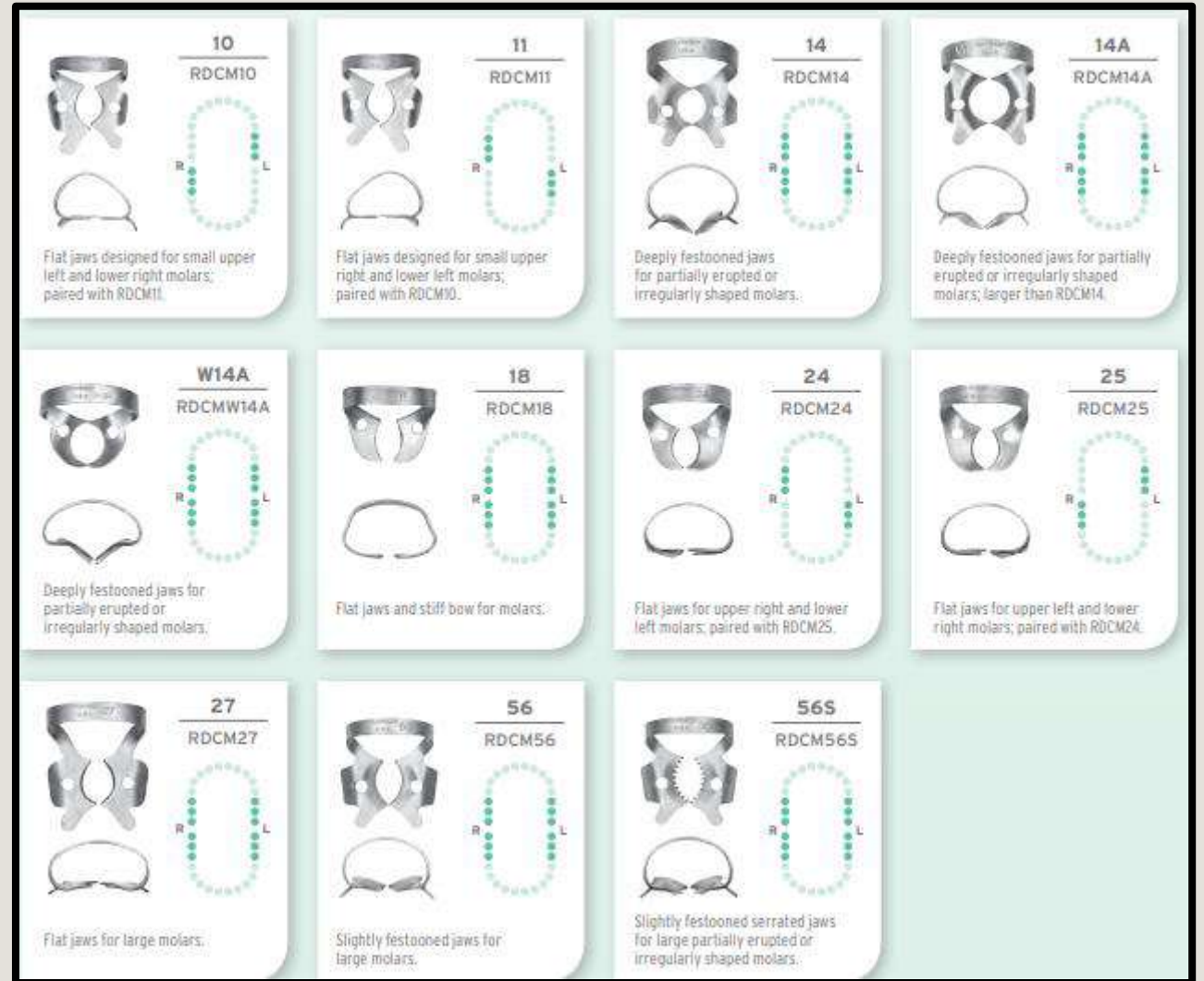
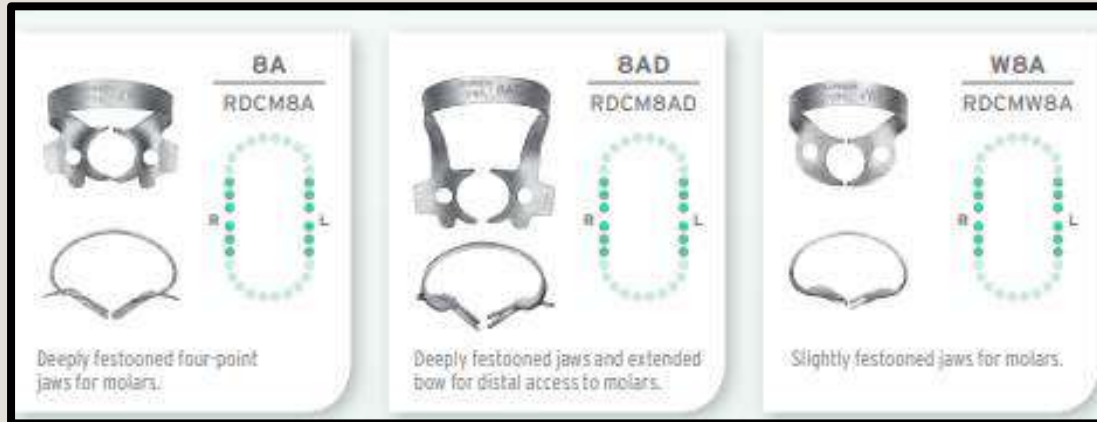
# HU FRIEDY RUBBER DAM CLAMPS

## FOR PREMOLARS



# HU FRIEDY RUBBER DAM CLAMPS

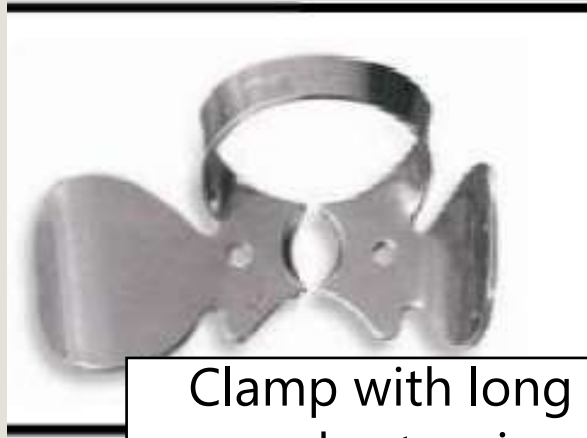
## FOR MOLARS



# RECENT ADVANCES IN RUBBER DAM CLAMPS



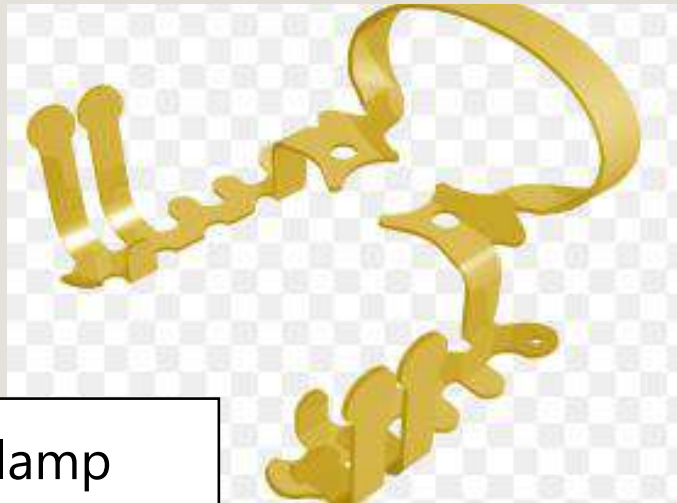
Tiger clamp



Clamp with long guard extension



Silker-Glickman clamp (S-G clamp)



Haller clamp



Cushee clamp

# RECENT ADVANCES IN RUBBER DAM CLAMPS



SUPER CLAMP  
(DENT CORP  
RESEARCH AND  
DEVELOPMENT, NY,  
USA)

Comes with a pre-cut rubber dam material designed to fit the clamp.

It can be used without the rubber dam to protect only the tongue and soft tissues.

It comes in three sizes:

L- large clamp for molars,

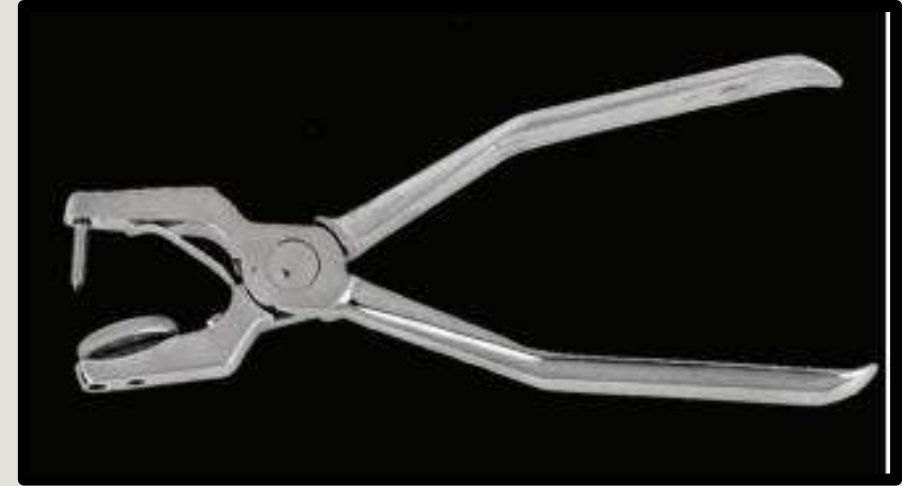
M- medium clamp which can also be used for molars and

S- small clamp which can be used for premolars

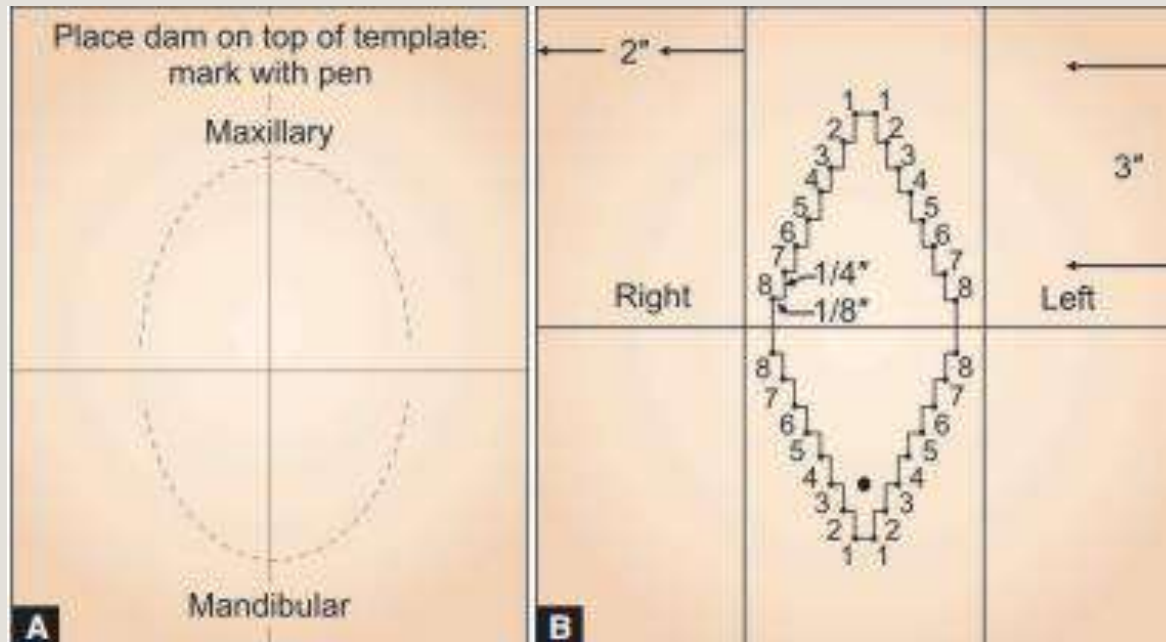
# RUBBER DAM



Rubber Dam  
Forceps

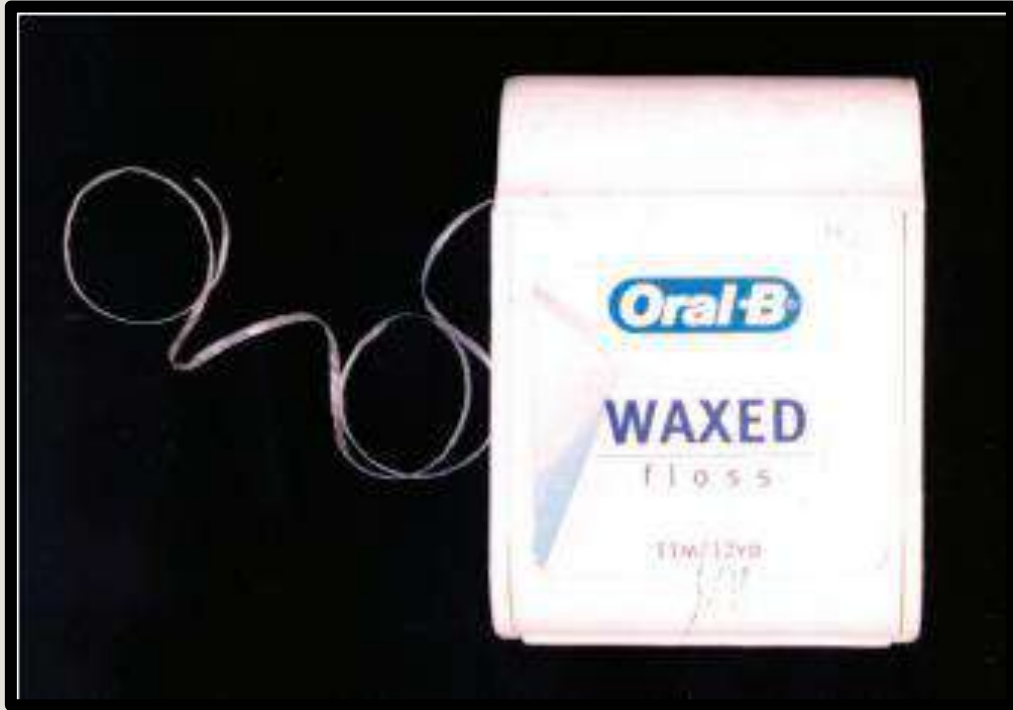


Rubber dam Punch



Rubber dam  
Template

# RUBBER DAM



Dental Floss  
Length- 12 inches

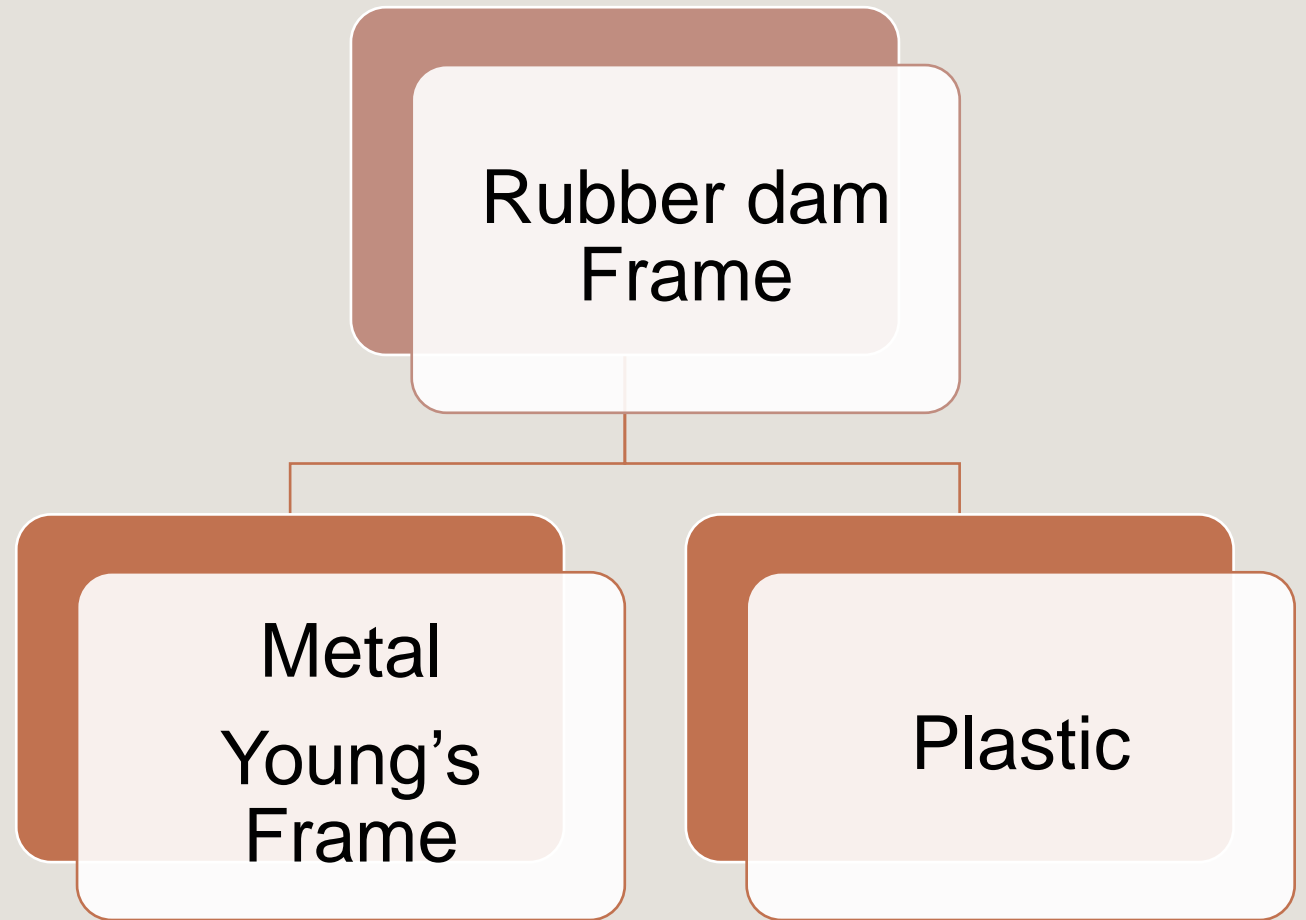


Wedjets/ Stabilising cord

# RUBBER DAM HOLDER/ FRAME



**Rubber Dam Frame:**  
U shaped and has has minute projections on its outer surface where the dam is secured.



# RECENT ADVANCES IN RUBBER DAM FRAME



## Nygaard Ostby Frame

Radiolucent nylon frame

Polygonal shape

Also called as “Shark Mouth”



## Le Cadre Articulated Frame:

Foldable Frames facilitating endodontic radiography



## Safe T Frame:

Two hinged frame members securely locks the rubber dam sheet

Thus dam sheet is less under tension and also reduces tugging on clamp

# RUBBER DAM APPLICATION



# TECHNIQUES OF RUBBER DAM APPLICATION

## ONE STEP TECHNIQUE (SINGLE TOOTH)



Suitable winged dental dam tried on



Clamp is placed in dental dam



Clamp along with dam stretched over tooth

# TECHNIQUES OF RUBBER DAM APPLICATION

## ONE STEP TECHNIQUE (SINGLE TOOTH)



Clamp engage onto the neck of the tooth



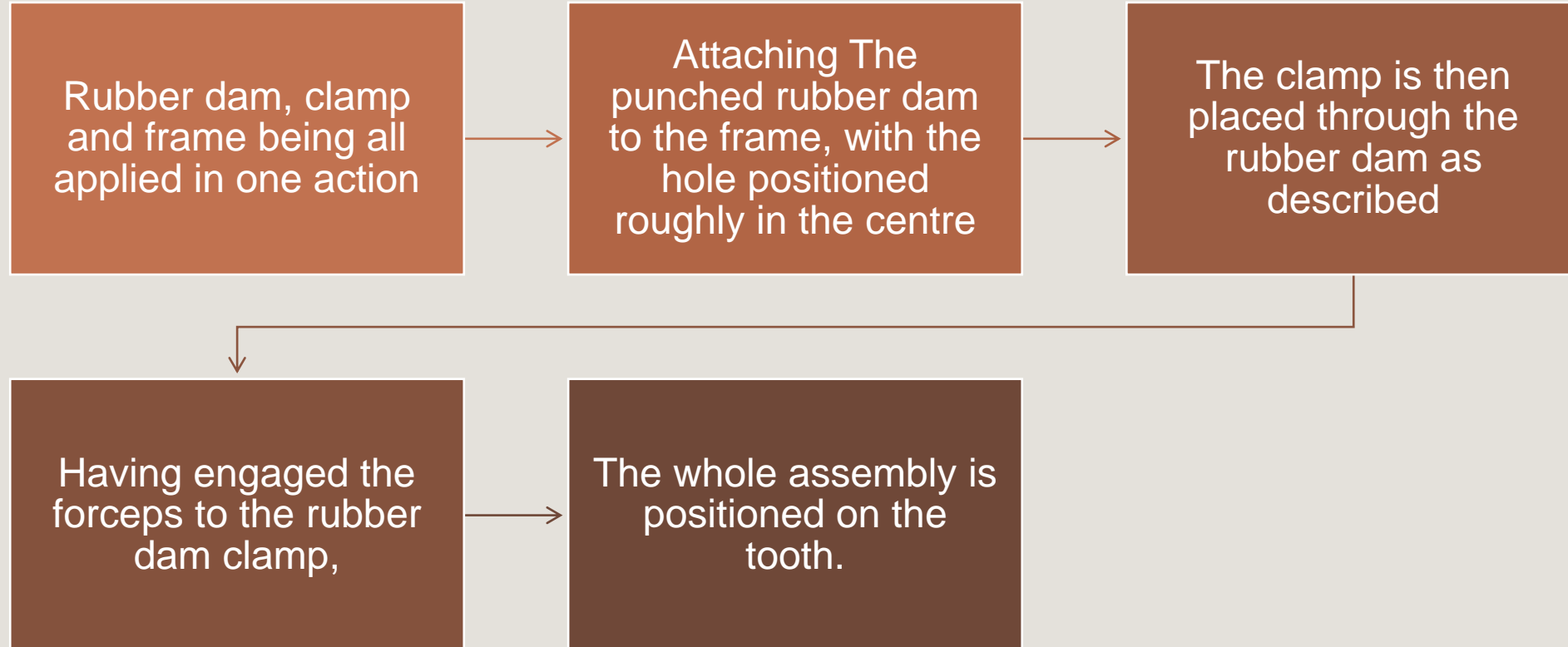
Forceps removed



Flat plastic instrument used to flip the dental dam of the wings

# ALL IN ONE TECHNIQUE

## MODIFICATION OF ONE STEP TECHNIQUE



# ALL IN ONE TECHNIQUE

## MODIFICATION OF ONE STEP TECHNIQUE



The assembled rubber dam, clamp and frame for the 'all-in-one' technique

# TECHNIQUES OF RUBBER DAM APPLICATION

## TWO STEP TECHNIQUE (SINGLE TOOTH)



Contacts are fossed through



Suitable clamp is tried



Clamp secured around the neck of the tooth

# TECHNIQUES OF RUBBER DAM APPLICATION

## TWO STEP TECHNIQUE (SINGLE TOOTH)



The rubber dam is stretched over the clamp



Floss is passed through the contact points



# RUBBER DAM FIRST TECHNIQUE

## MODIFICATION OF TWO STEP TECHNIQUE

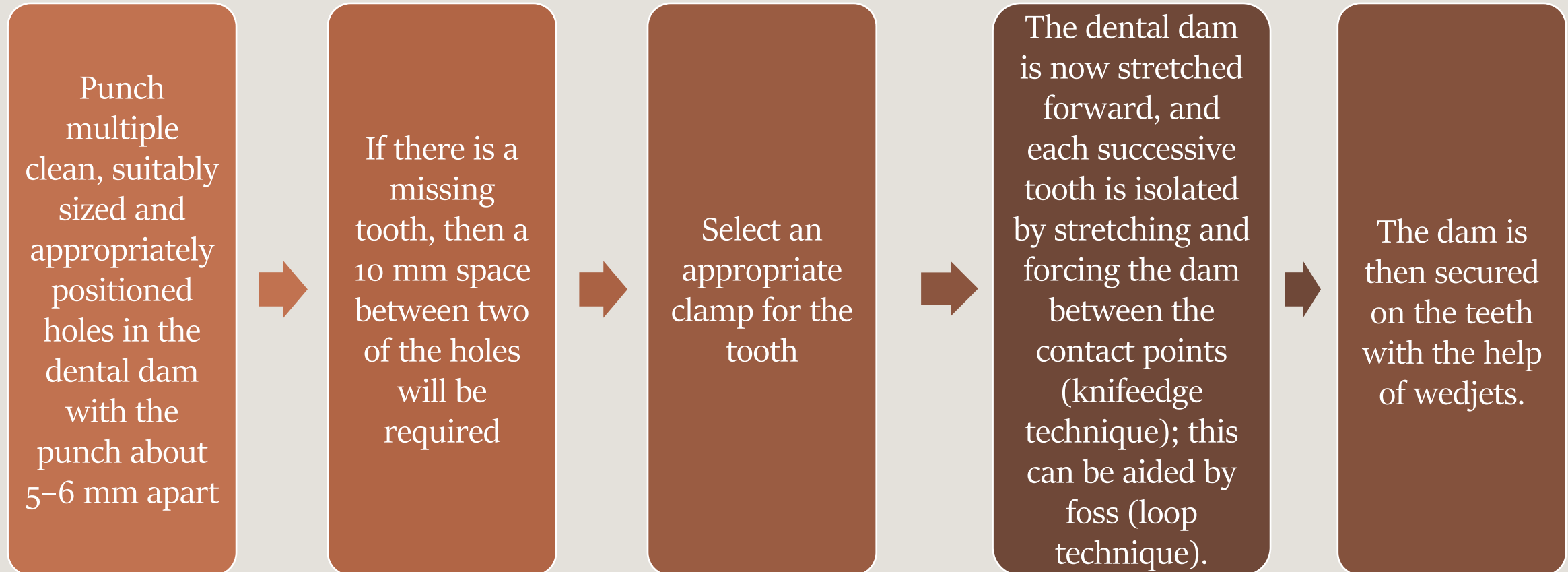
Rubber dam is applied first

Then secured with a clamp.

Useful for isolating anterior teeth where a butterfly-shaped rubber dam clamp or a wedging device, for example, a strand of stabilising cord is used.

# TECHNIQUES OF RUBBER DAM APPLICATION

## MULTIPLE TEETH ISOLATION



# TECHNIQUES OF RUBBER DAM APPLICATION

## MULTIPLE TEETH ISOLATION



Post-core preparation under dental dam



Resin-retained bridge preparation under dental dam

# SPLIT RUBBER DAM TECHNIQUE

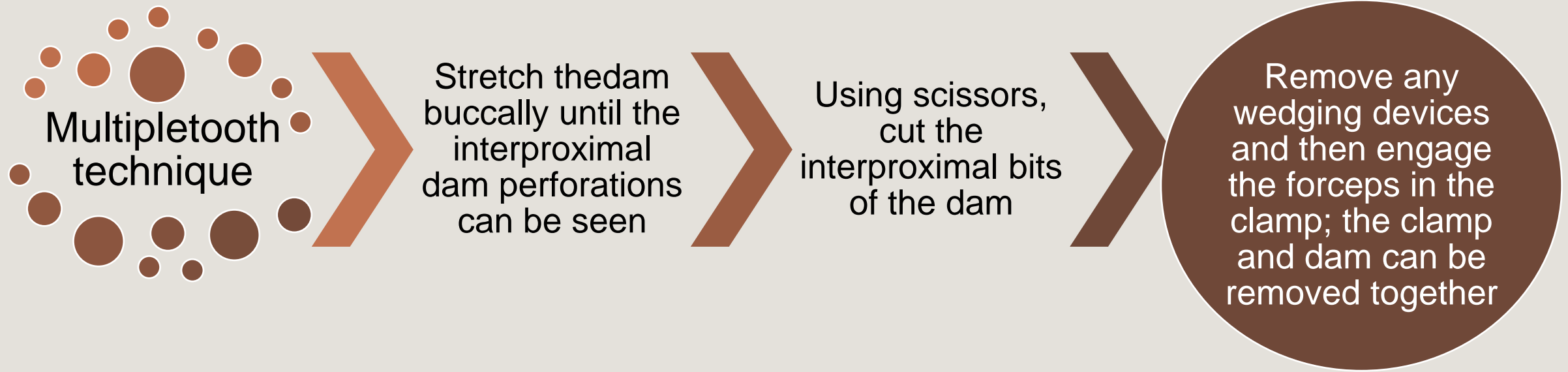


Two holes are punched in the dental dam sheet approximately 5 mm apart; scissors are then used to cut the dam to join these two holes together

Clamps can be placed on the two adjacent teeth and the dental dam stretched over.

Alternatively, the dam could be secured with Wedjets, a combination of clamps and Wedjets, or sometimes flossing the dental dam through the contact points alone is sufficient to retain the dam

# REMOVAL OF RUBBER DAM



# RECENT ADVANCES IN RUBBER DAM

## INSTIDAM (Zirc)

Built in Frame with pre-punched holes off centre by 1/2 inches.

Radiographs can be taken by bending the instidam to one side.



## HANDIDAM (Aseptico) Pre framed Rubber Dam



# RECENT ADVANCES IN RUBBER DAM

## OPTRA DAM (Ivoclar)

Patented anatomical shape that exposes both the arches

No metal clamps are required

Can be kept while taking x rays.



## OPTIDAM (Kerr)

Anatomical 3D Thermoplastic Frame

Preformed dam with raised lab design

Applies minimal tension on the clamp

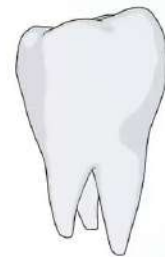
Available in anterior and posterior versions.

# RECENT ADVANCES IN RUBBER DAM

## MINI DAM

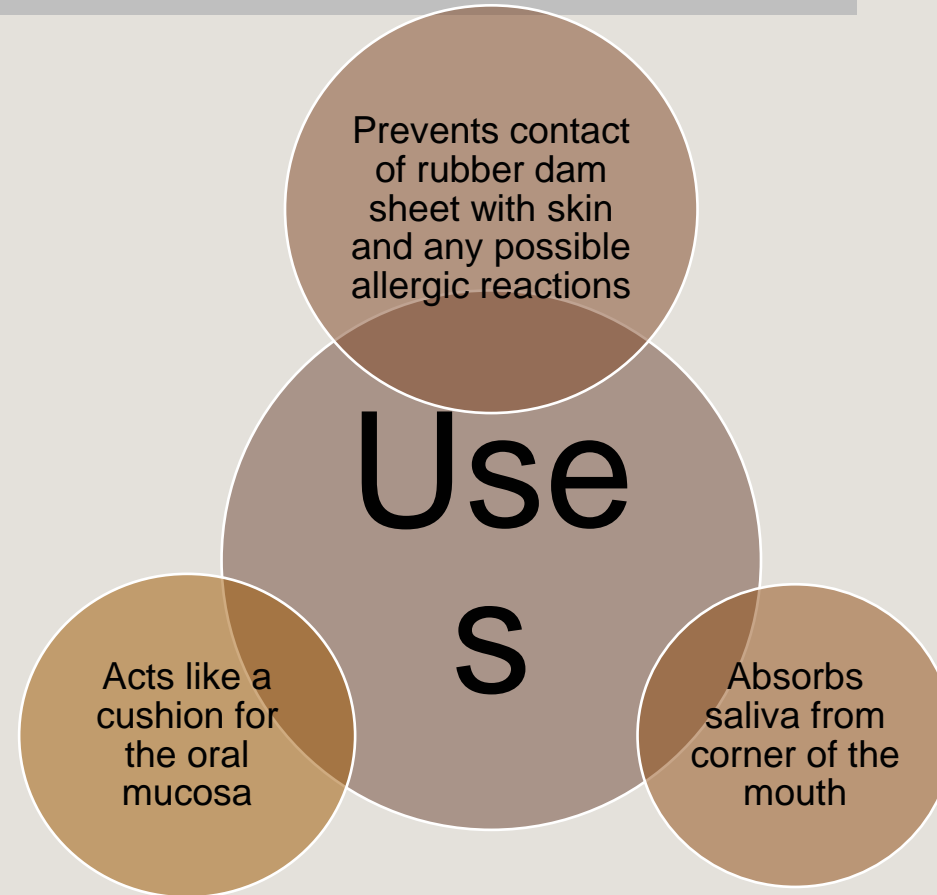
Latex free elastic dam

Can be placed without the help of any clamps



# RUBBER DAM NAPKIN

- Disposable paper placed between skin and rubber dam sheet



## INDIRECT METHODS

Using a local anesthetic helps in reducing the discomfort associated with the treatment in addition to controlling moisture by decreasing salivation.

Making the patient comfortable, less anxious and less sensitive to stimuli helps in producing a lower salivary flow thus helping in moisture control.

Another advantage is the vasoconstriction caused by the local anesthetic (containing vasoconstrictor) which helps in reducing hemorrhage at the operating site

# ANTI SIALOGOGUES

## INDIRECT METHODS

These medications are rarely used. However, occasionally a patient whose salivary flow is extremely excessive requires medicaments.

This will substantially decrease the salivary flow, but should be avoided in patients with high ocular pressure or with cardiovascular problems

Atropine – 0.5-1mg (1/2 hour before appointment)  
Propantheline (Pro banthine- 7.5mg, 15mg, 30mg)

Sikri Vimal, Textbook of Operative dentistry, Fourth ed., 2017  
Adhapure et al Advances in soft tissue management: a review. International journal of basic and applied medical 2015

# ANTI ANXIETY DRUGS

## INDIRECT METHODS

Pre medication is helpful with extremely apprehensive patients

Diazepam, barbiturates 24 hours before the appointment

Disadvantage- psychological dependence

Sikri Vimal, Textbook of Operative dentistry, Fourth ed., 2017

Adhapure et al Advances in soft tissue management: a review. International journal of basic and applied medical 2015

# GINGIVAL TISSUE MANAGEMENT

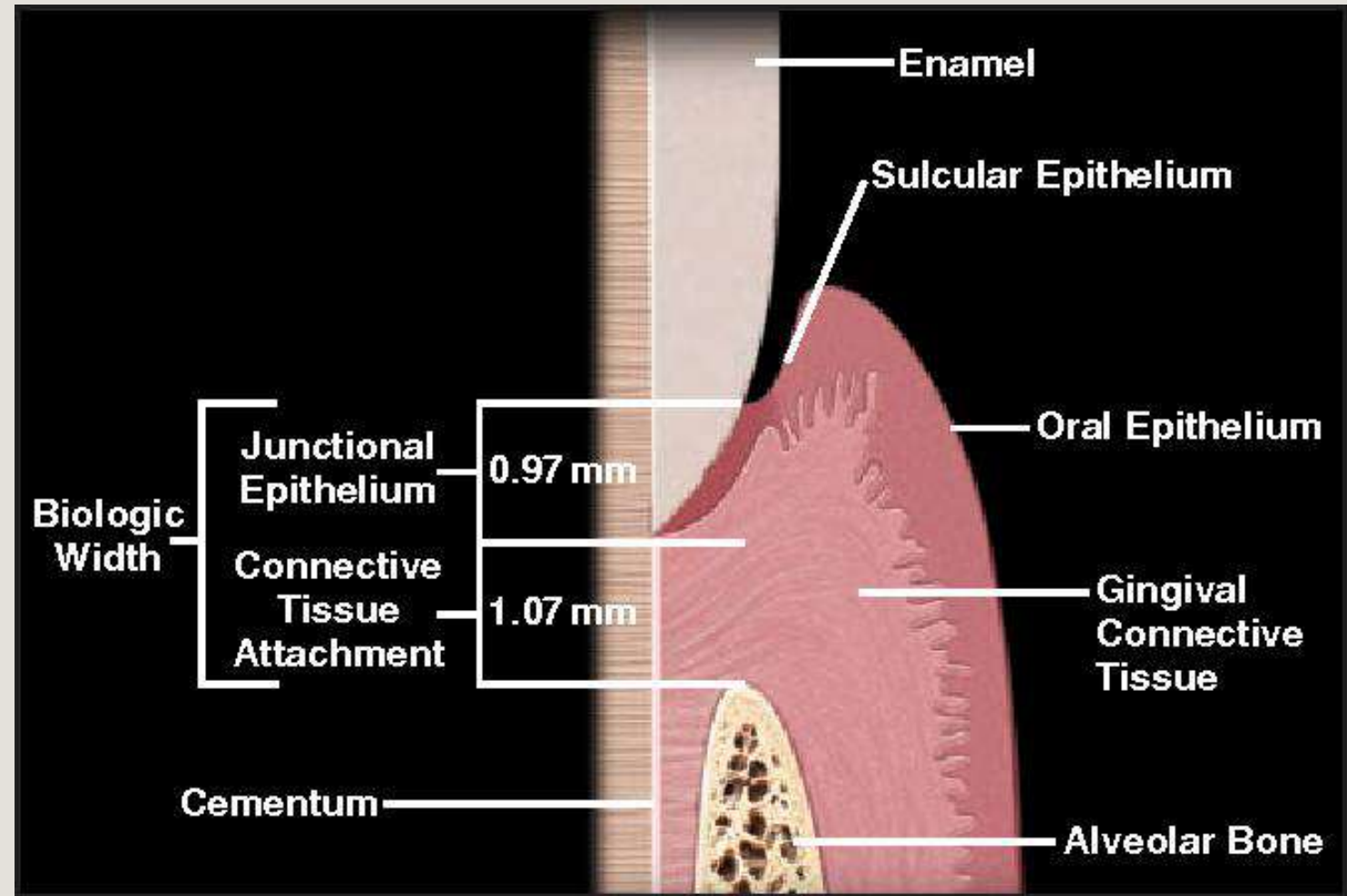
Gingival tissue management is integral to achieving successful and long-lasting restorations.

It ensures not only the functional integrity of the restoration but also the overall health and esthetics of the oral cavity.

Esthetic considerations of teeth and soft tissue play a major role in the treatment planning of dental care especially in the restoration of anterior teeth

Endodontically treated teeth must be protected with extracoronal restoration keeping in mind the concept & importance of biological width.

# BIOLOGICAL WIDTH



**“The biological width should not be violated at any cost”**

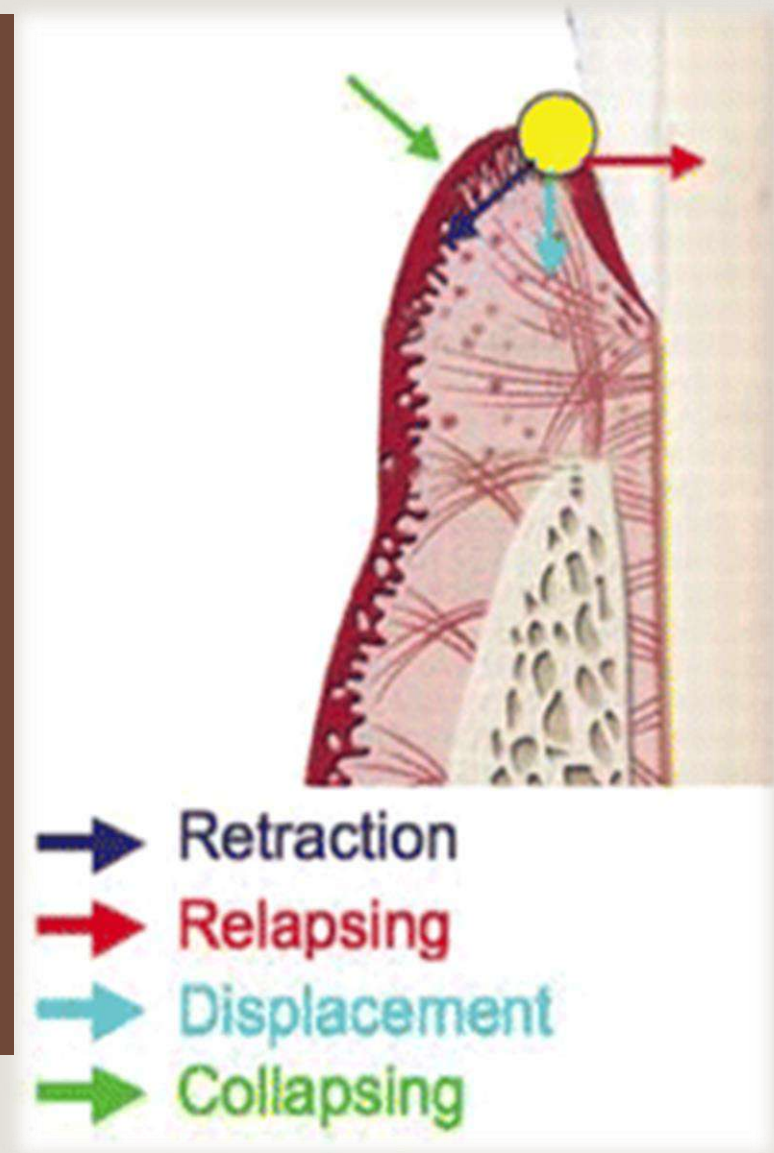
Padbury Jr A, Eber R, Wang H-L. Interactions between the gingiva and the margin of restorations. J Clin Periodontol 2003; 30: 379–385.

➤ **RETRACTION** – is the downward and outward movement of the free gingival margin

➤ **RELAPSE** – is the tendency of the gingival cuff to go back to its original position.

➤ **DISPLACEMENT** – is a downward movement of the gingival cuff that is caused by overhanging margins of restorations bearing down on unsupported retracted gingival tissues.

➤ **COLLAPSE** – is the tendency of the gingival cuff to flatten under forces associated with the use of closely adapted customized impression trays



# CLASSIFICATION OF GINGIVAL RETRACTION

## Barkmeier & Williams 1978

### 1. Surgical retraction

- Gingivectomy
- Gingivoplasty
- Periodontal flap procedures
- Electrosurgery
- Rotary gingival curettage

### 2. Non – surgical retraction

- Rubber dam & clamps
- Retraction cord
- Retraction rings
- Copper band

## Thompson MJ 1959

1. Conventional
2. Radical

## Benson et al 1986

1. Mechanical
2. Chemico – mechanical
3. Rotary gingival curettage
4. Electrosurgery

# CLASSIFICATION OF GINGIVAL RETRACTION

## Gilmore

1. Retraction with cords
2. Surgery
  - Knife
  - Electric cautery
  - Electrocoagulation
  - Cold cautery
3. Chemical
  - Zn chloride
  - Sodium sulphide
  - Potassium hydroxide
  - Negatol solution

## Marzouk

1. Physico – mechanical
2. Chemical
3. Electrosurgical
4. Surgical

## Tylman

1. Mechanical
2. Mechanico – chemical
3. Surgical
  - Electrosurgery
  - Gingettage

## Shillinburg

1. Mechanical
2. Chemico – mechanical
3. Rotary
4. Electrosurgery

Marzouk – Text book of operative dentistry

Shillingberg – Fundamentals of fixed prosthodontics, 3rd edition

Tylman - Fundamentals of Fixed Prosthodontics 2nd edition

# PHYSICAL/ MECHANICAL METHODS



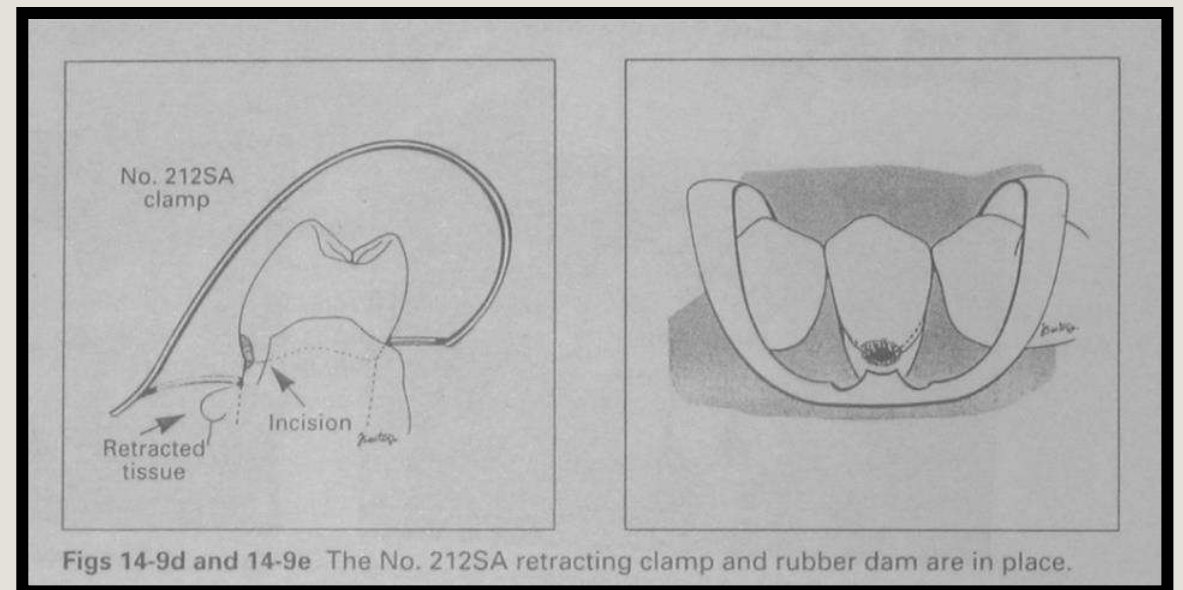
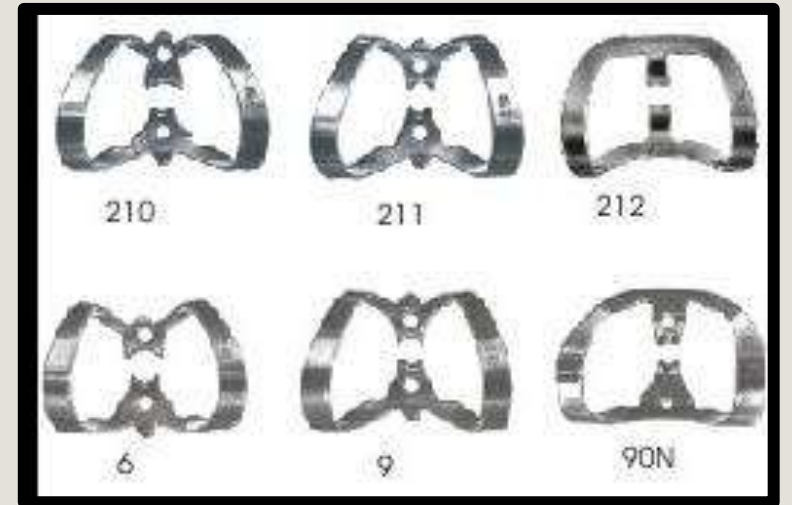
- Mechanically displace gingiva outwards & apically away from tooth surface
- **Indication** : Normal healthy gingiva with adequate attached gingiva

Gingival retraction cords or rolled cotton twills introduced into the gingival sulcus not only aid in isolation against gingival fluid seepage but also produce apical and lateral deflection.

# RUBBER DAM CLAMPS

## 212 clamp series

- Aids in gingival retraction
- Produced retraction by compression



Katta PK, Sreedhara S. Gingival tissue management in Restorative Dentistry. CODS J Dent 2015;7: 33 - 35.  
Marzouk – Text book of operative dentistry

# RUBBER DAM CLAMPS

## Brinker's tissue Retractors

- Soft untempered clamps of the 212 type
- Little gripping power
- Easily deformed
- Limited life

### Brinker Gingival Tissue Retractors



#B1  
Lower Molars



#B2  
Upper Left Molars



#B3  
Upper Right Molars



#B4  
Anterior & Canines



#B5  
Class V restorations on all teeth



#B6

Katta PK, Sreedhara S. Gingival tissue management in Restorative Dentistry. CODS J Dent 2015;7: 33 - 35.

# WOODEN WEDGES



Mechanically depresses the interproximal gingiva

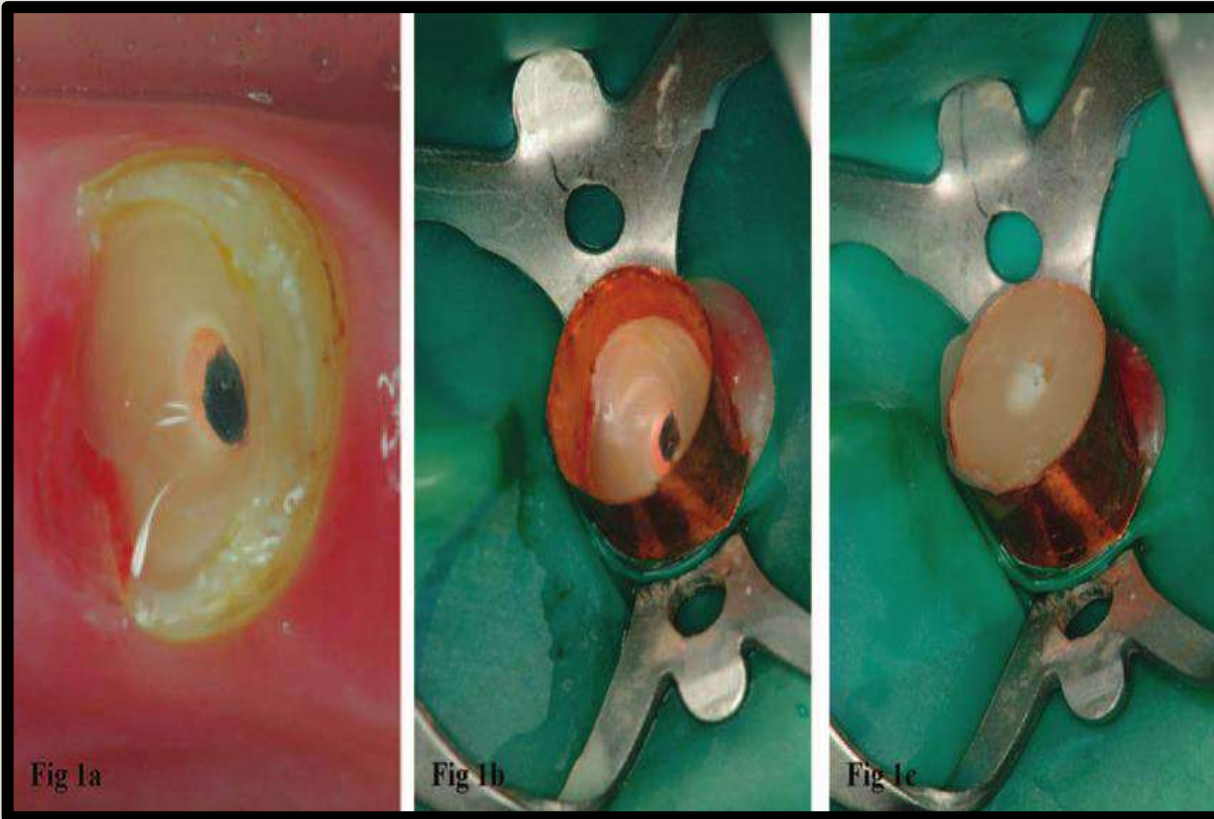
# ZOE IMPREGNATED FINE COTTON TWILLS

- Indication : Deep cervically involved teeth
- Gingival tissue eversion

Advantages	Disadvantages
Good tissue tolerance	Time consuming
Effective tissue eversion	Extended periods of packing
Ample working time	Loss of periodontal attachment
Promotes granulation	

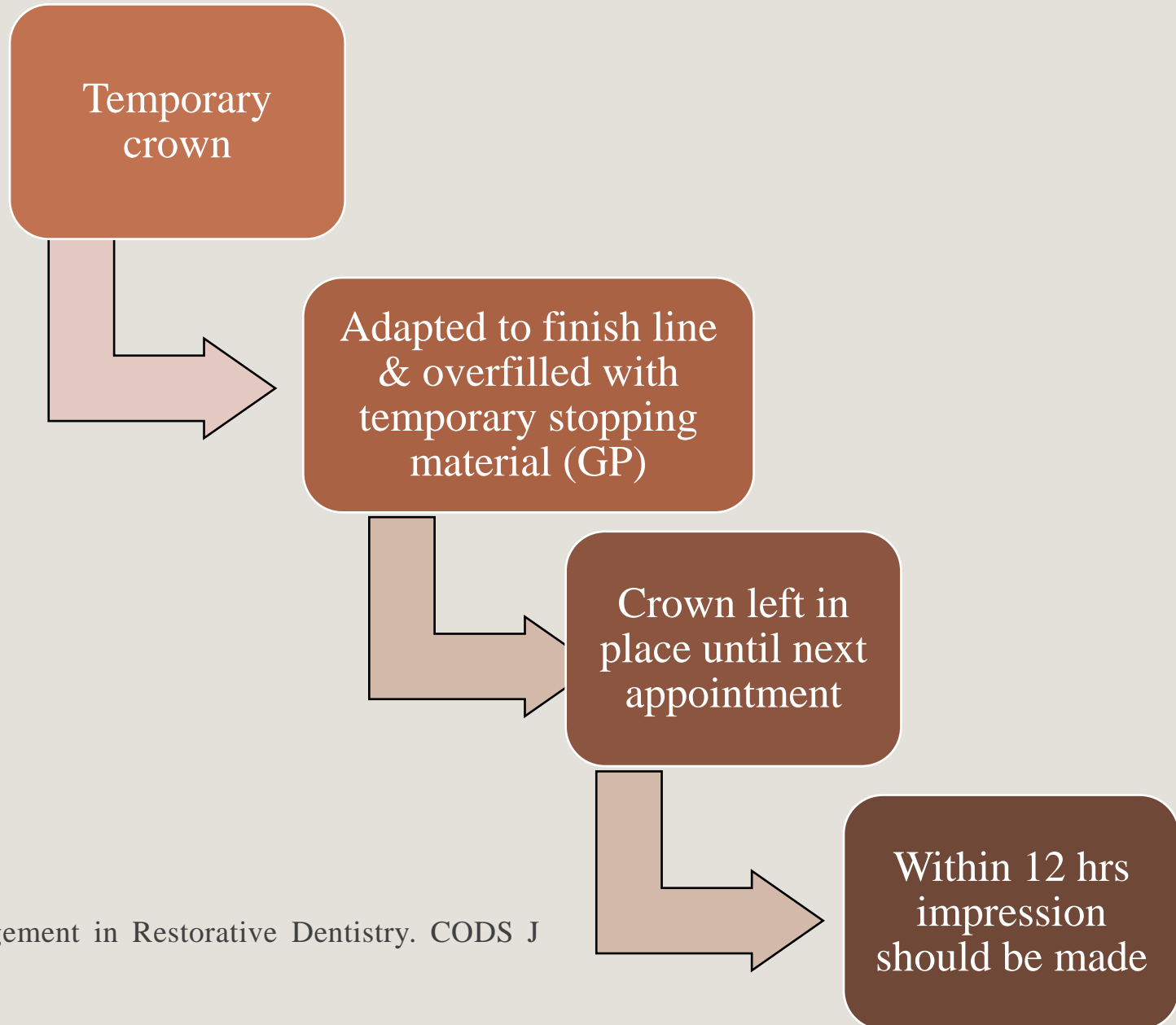
# COPPER BAND/TUBE

- Matrix method
- Means of carrying impression material
- Mechanism for displacing gingiva
- Indication : multiple tooth preparations



Advantages	Disadvantages
Minimal recession	Incisional injuries
	Excessive pressure cause stripping of tissues

# OVERSIZED TEMPORARY CROWN



Katta PK, Sreedhara S. Gingival tissue management in Restorative Dentistry. CODS J Dent 2015;7: 33 - 35.

# CHEMICAL METHODS

Most commonly used chemicals are:

Vasoconstrictors

Astringents and styptics

Tissue coagulants

Gingival retraction involves carrying the chemicals with

Gingival retraction cords

Cotton rolls

Cotton pellets

Katta PK, Sreedhara S. Gingival tissue management in Restorative Dentistry. CODS J Dent 2015;7: 33 - 35.

# CLASSIFICATION OF CHEMICALS USED

## Nowakowska

1. **Class I**
  - Vasoconstrictors
  - Adrenergics
2. **Class II**
  - Hemostatic agents
  - Astringents

## Marzouk

1. **Vasoconstrictors**
  - Epinephrine
  - Nor - epinephrine
2. **Biologic fluids coagulants**
  - 100% alum
  - 15 - 25% AlCl<sub>3</sub>
  - 10% aluminium potassium sulfate
  - 15 - 25% tannic acid
3. **Surface layer tissue coagulants**
  - 8% Zn chloride
  - Silver nitrate

## Thompson

1. **Styptics**
  - 8% Zn chloride
  - Ferric subsulfate
  - 20% Tannic acid
  - 14% Alum
2. **Chemical cautery**
  - 40% Zn chloride
  - Potassium hydroxide
3. **Vasoconstrictors**
  - Epinephrine
  - 3% Ephedrine sulfate

Katta PK, Sreedhara S. Gingival tissue management in Restorative Dentistry. CODS J Dent 2015;7: 33 - 35.

# VASOCONSTRICTORS

## □ Epinephrine or Nor epinephrine

Reduce the blood supply of the area

Decrease haemorrhage, tissue fluid seepage and hence the size of the free gingiva

8% racemic epinephrine – most commonly used

- Disadvantages:
- Rapid transient elevation in blood sugar and blood pressure if applied directly to the abraded gingiva
- Produces local ischemia which is injurious to the gingiva.

Nemetz H, Donovan T, Landesman H. Exposing the gingival margin: a systematic approach for the control of hemorrhage. J Prosthet Dent 1984;51:647.

# BIOLOGIC FLUID COAGULANTS



- It locally coagulates blood & tissue fluids, creating a surface layer
- That is an efficient sealant against blood & crevicular fluid seepage
- Induce no systemic effects – very safe
- Stable only at low pH levels – so it has effect on smear layer

1. 15 – 25% Aluminum chloride
2. 100% Alum (Potassium aluminum sulfate)
3. 10% Aluminum sulfate
4. Ferric sulfate/ Monsel's solution
5. 15 – 25% Tannic acid



Nemetz H, Donovan T, Landesman H. Exposing the gingival margin: a systematic approach for the control of hemorrhage. J Prosthet Dent 1984;51:647.

# SURFACE TISSUE COAGULANTS

- 8% Zn chloride
- Silver nitrate

➤ It coagulates the surface layer of sulcular & free gingival epithelium as well as seeped fluid

➤ Thus creating temporarily impenetrable film for underlying fluids (including blood)

➤ Local hazards:

1. Local necrosis
2. Ulceration
3. Change in dimension & location of free gingiva application

} Higher concentration  
+  
Excessive time of

Nemetz H, Donovan T, Landesman H. Exposing the gingival margin: a systematic approach for the control of hemorrhage. J Prosthet Dent 1984;51:647.

Chemical	Advantages	Disadvantages
8% & 40% ZnCl <sub>2</sub>	<ul style="list-style-type: none"> <li>➤ Good displacement</li> </ul>	<ul style="list-style-type: none"> <li>➤ Tissue necrosis</li> <li>➤ Permanent tissue injury</li> </ul>
100% Alum	<ul style="list-style-type: none"> <li>➤ Minimal tissue loss</li> <li>➤ Extended working time</li> </ul>	<ul style="list-style-type: none"> <li>➤ Less displacement &amp; hemostasis than epinephrine</li> </ul>
5% & 25% AlCl <sub>3</sub>	<ul style="list-style-type: none"> <li>➤ Minimal tissue loss</li> <li>➤ Good hemostasis</li> </ul>	<ul style="list-style-type: none"> <li>➤ Tissue destruction if conc. &gt;10%</li> </ul>
Ferric subsulfate (Monsel's solution)	<ul style="list-style-type: none"> <li>➤ Good displacement</li> </ul>	<ul style="list-style-type: none"> <li>➤ Messy to use</li> <li>➤ Highly acidic</li> <li>➤ Corrosive</li> </ul>
13.3% Ferric sulfate	<ul style="list-style-type: none"> <li>➤ Good tissue response</li> <li>➤ Extended working time</li> <li>➤ Good displacement</li> </ul>	<ul style="list-style-type: none"> <li>➤ Noncompatible with epinephrine</li> <li>➤ Unpleasant taste</li> </ul>
10% & 100% Negatol	<ul style="list-style-type: none"> <li>➤ Good displacement</li> </ul>	<ul style="list-style-type: none"> <li>➤ Poor tissue response</li> <li>➤ Highly acidic</li> <li>➤ Corrosive</li> </ul>
20% & 100% Tannic acid	<ul style="list-style-type: none"> <li>➤ Good tissue response</li> </ul>	<ul style="list-style-type: none"> <li>➤ Less displacement than epinephrine</li> <li>➤ Minimal hemostasis</li> </ul>

# GINGIVAL RETRACTION CORD

# MECHANICAL METHODS



# GINGIVAL RETRACTION CORD- CLASSIFICATION

## *Depending on the configuration*

- Plain
- Twisted
- Braided or Knitted

## *Depending on the surface finish*

- Waxed
- Unwaxed

## *Depending on the chemical treatment*

- Plain
- Impregnated

## *Depending on the number of strands*

- Single
- Double

## *Depending on the thickness (colour)*

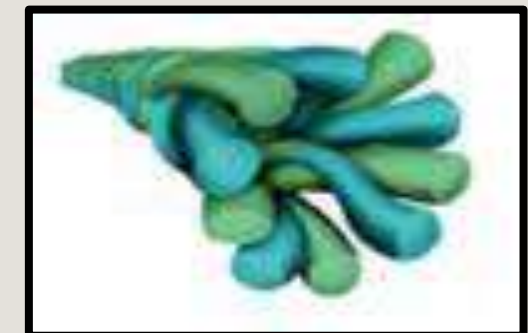
- Black 000
- Yellow 00
- Purple 0
- Blue 1
- Green 2
- Red 3



Twisted

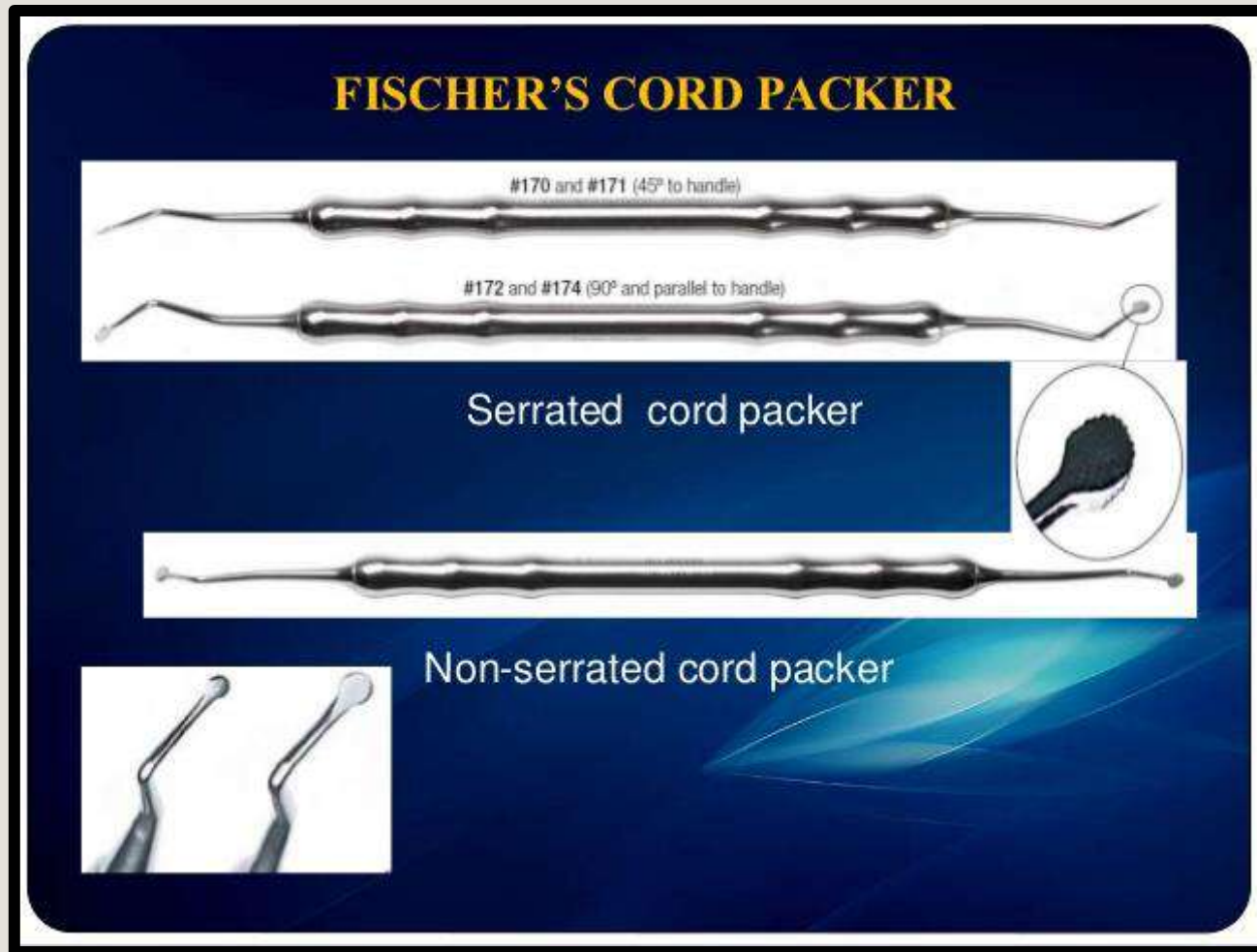


Knitted



Braided

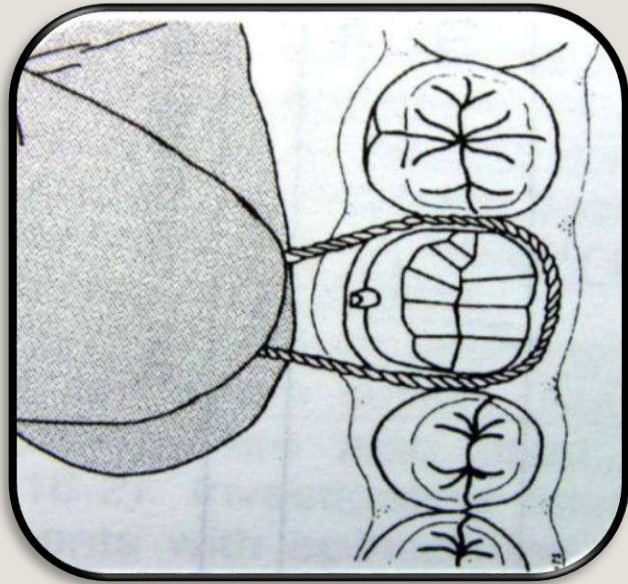
# GINGIVAL RETRACTION CORD PACKER



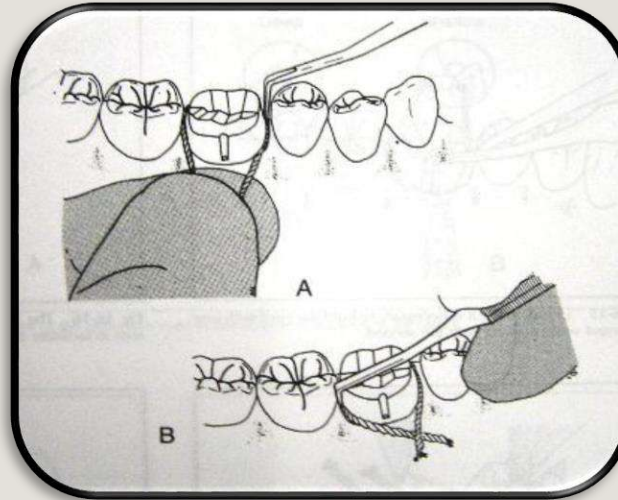
- Small enough in all dimensions to avoid gingival injury
- End of blade should be flat
- No sharp corners should be present

# GINGIVAL RETRACTION TECHNIQUES

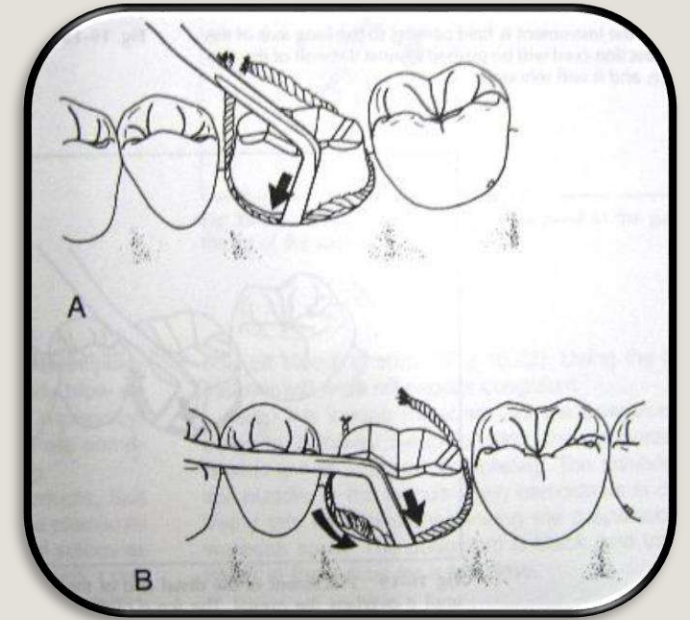
## SINGLE CORD TECHNIQUE



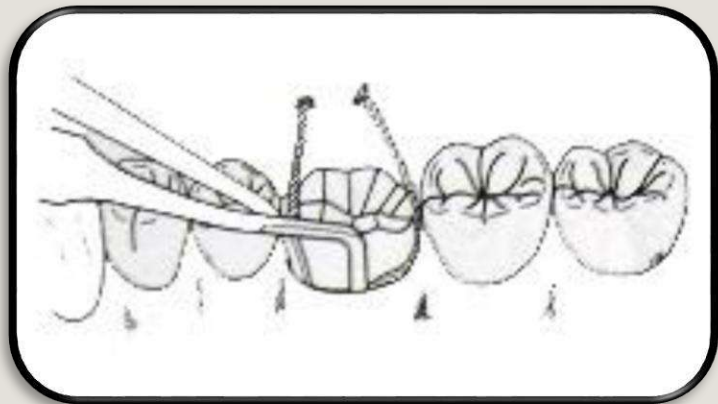
Cord length –  $\frac{1}{2}$  inch longer than the circumference of preparation



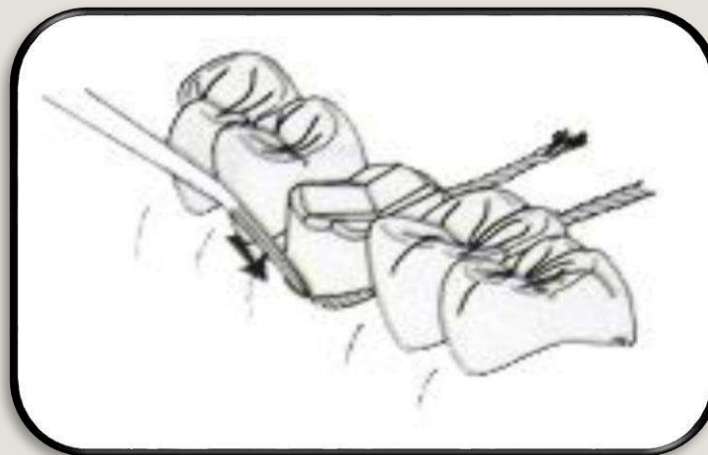
Start packing from mesial interproximal area



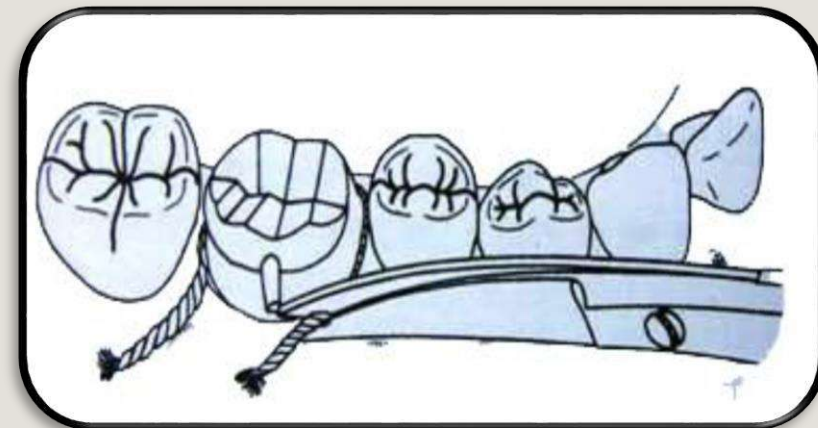
As the cord is placed subgingivally, instrument must be pushed slightly towards the area already tucked in



Hold the cord with one instrument while packing with the 2<sup>nd</sup>

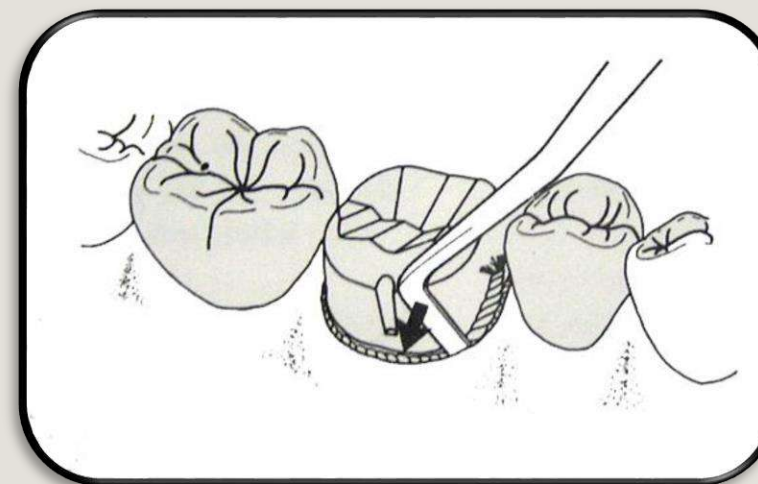


Instrument must be angled towards the root to facilitate subgingival placement of cord



Cut off the excess of cord in mesial interproximal area

Finish the placement of distal end of cord until it overlaps the mesial

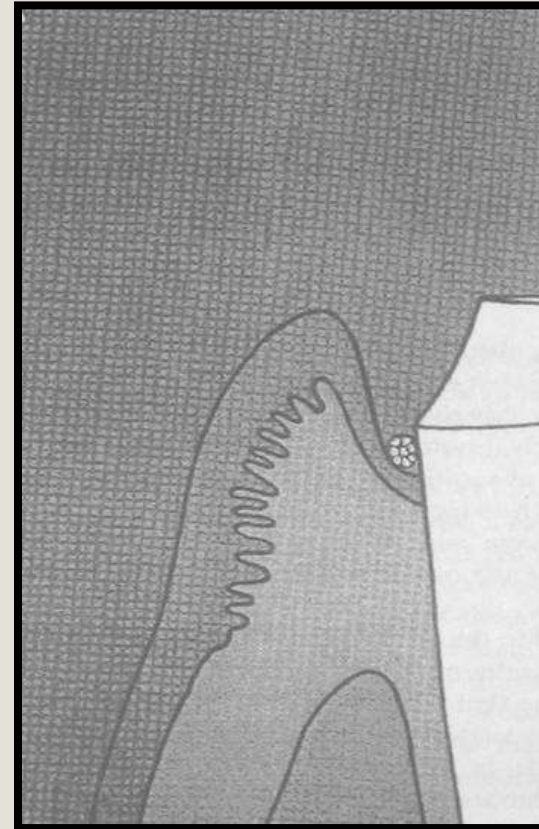


# GINGIVAL RETRACTION TECHNIQUES

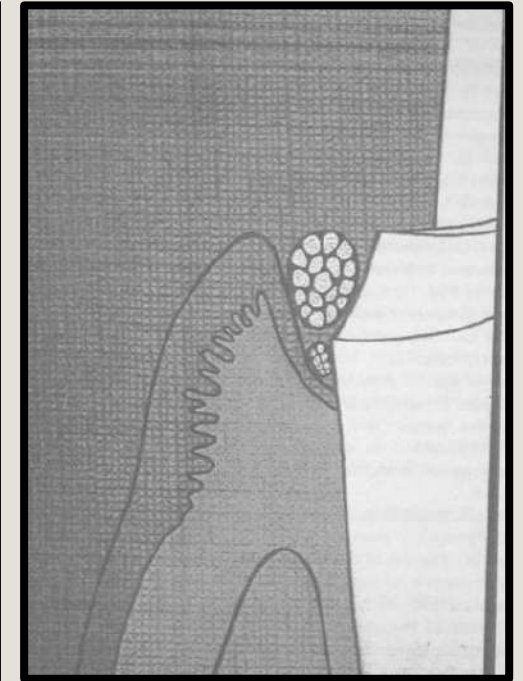
## DOUBLE CORD TECHNIQUE/ DEKNATAL TECHNIQUE

### Indications

- Multiple prepared teeth
- Compromised gingival tissue health



A small diameter cord is placed first



2<sup>nd</sup> cord placed over the 1<sup>st</sup> one

# GINGIVAL RETRACTION TECHNIQUES

## EVERY OTHER TOOTH TECHNIQUE

- Can be used with the single or double cord technique
- Retraction cord is placed around the most distal prepared tooth
- Retraction procedures are completed on alternate teeth

# GINGIVAL RETRACTION TECHNIQUES

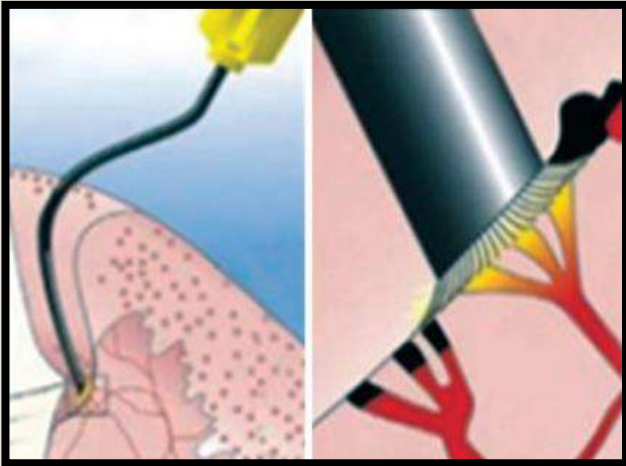
## SELECTIVE DOUBLE STRING TECHNIQUE

- Used in cases where spontaneous bleeding during impression
- Pre packing of extra thin cord into inflamed portion
- Followed by packing of impregnated braided cord

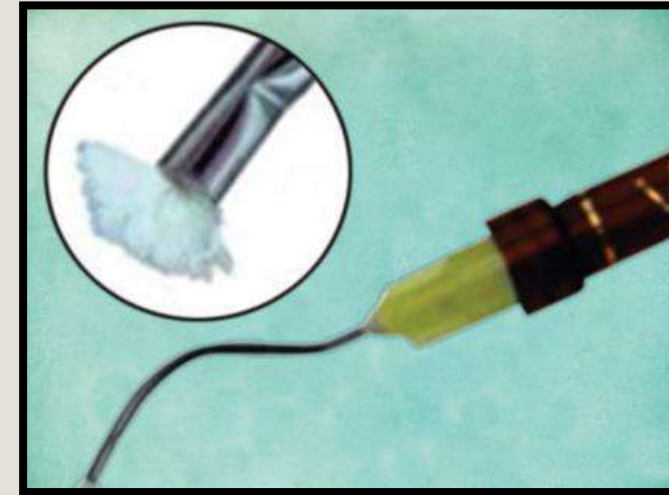
# GINGIVAL RETRACTION TECHNIQUES

## INFUSION TECHNIQUE

- Introduced by Dan E Fisher in 1981
- Use along with single cord technique

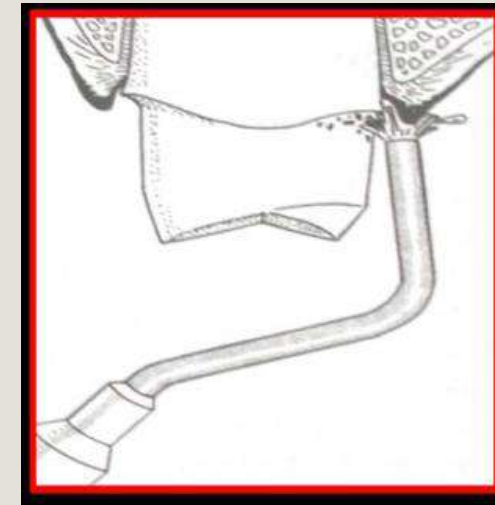


Infuser is used with a burnishing motion circumferentially 360 around the sulcus

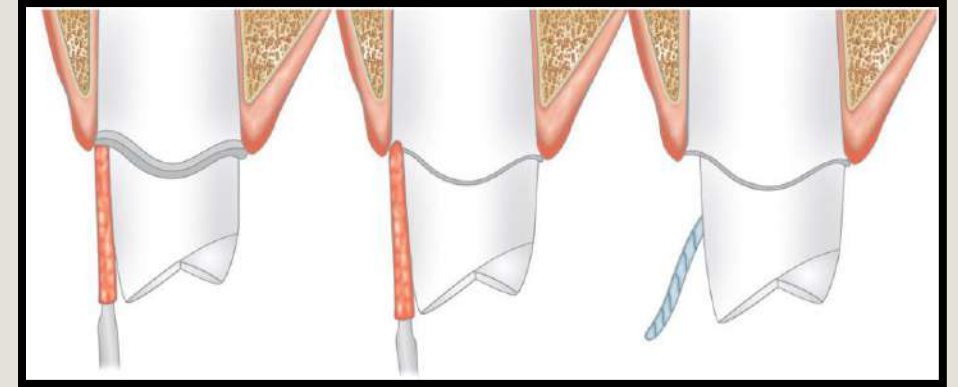


Dento – infuser with 15% or 20% Ferric sulfate

Medicament is extruded from syringe/ infuser



## SURGICAL METHODS



- Gingetage/ Denttage/ Troughing technique
- Performed on healthy tissue
- A portion of sulcular epithelium is excised
- Torpedo shaped diamond bur

# ROTARY CURETTAGE

- **Criteria for Gingetage**
- No bleeding on probing
- Sulcus depth < 3mm
- Adequate keratinized gingiva



Advantages	Disadvantages
Reduce excessive tissue	Occasionally painful
Help to contour gingival outline	Tissue recession (Kamansky et al 1984)

## ELECTRO-SURGICAL METHODS

- Surgical diathermy
- It is a high frequency oscillator to deliver a high frequency current of at least 1.0 MHz
- 2 types of electro surgical units :
- Monopolar (commonly used in dentistry)
- Bipolar

### Uses

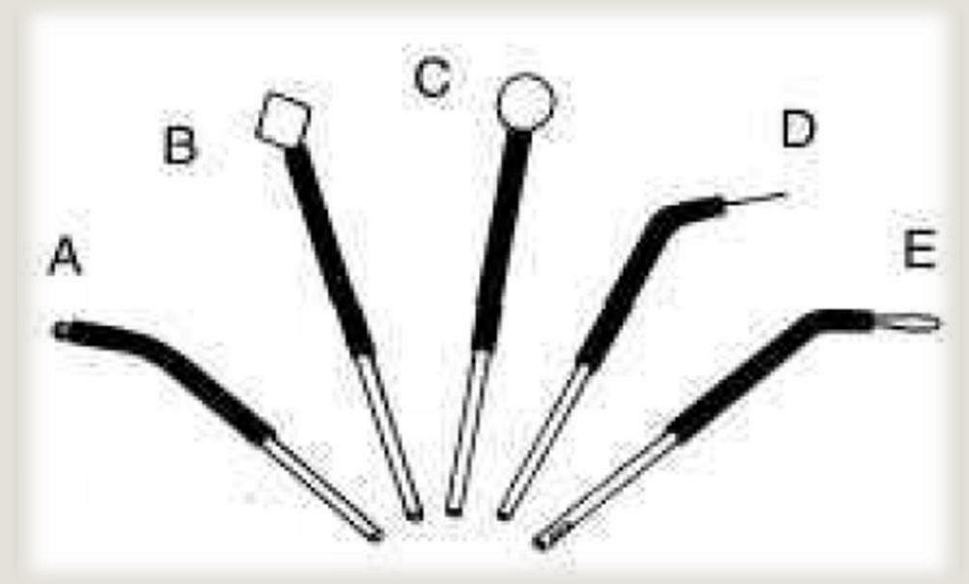
1. Crown lengthening
2. Create a subgingival sulcus
3. Remove hypertrophic tissues



# ELECTROSURGICAL METHODS

## CUTTING EDGE DESIGNS

- A. Coagulating probe
- B. Diamond loop
- C. Round loop
- D. Small straight probe
- E. Small loop



# ELECTROSURGICAL METHODS

Advantages	Disadvantages
Controls hemorrhage	Contra indicated in non compatible/ poorly shielded cardiac pace maker patients
Increases operative efficiency	Unpleasant odor & taste
Reduce chair time	
Prevents bacteria into incision site	
Self sterilizing & flexible electrodes	
Planing of soft tissues	
Eliminates scar formation	

# CRYOSURGERY

- Tissue destruction by extreme cold application
- Delivering by means of “Cryoprobe”
- e.g. Liquid nitrogen or Nitrous oxide gas at -150 C



Advantages	Disadvantages
Minimum blood loss	Tissue sensitivity Limited clinical evidence
More conservative	Determination of amount of tissue lost is difficult



# LASERS

Neodymium:  
Yttrium –  
Aluminum –  
Garnet (Nd –  
YAG) Lasers

CO2 Lasers

Er – YAG Lasers

Advantages	Disadvantages
Excellent hemostasis by CO2 laser	No tactile feedback for CO2 laser, leading to risk of damage to junctional epithelium
Reduced tissue shrinkage	
Relatively painless	
Sterilize the sulcus	

# EXPASYL RETRACTION PASTE

## RECENT MATERIALS FOR GINGIVAL RETRACTION

### Composition

- Kaolin 66.75%
- AlCl<sub>3</sub> 6.54%
- Oil of lemon 0.33%
- Water 25.36%
- Colorant 1.02 %

- Introduced by Kerr corporation
- Cordless gingival retraction system
- Chemico – mechanical technique



# EXPASYL RETRACTION PASTE



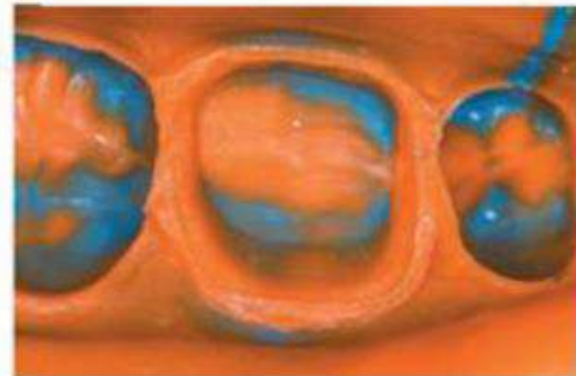
**Figure 1: Expasyl is injected into the sulcus**



**Figure 2: Left for 1-2 minutes and then rinsed**



**Figure 3: After rinsing**

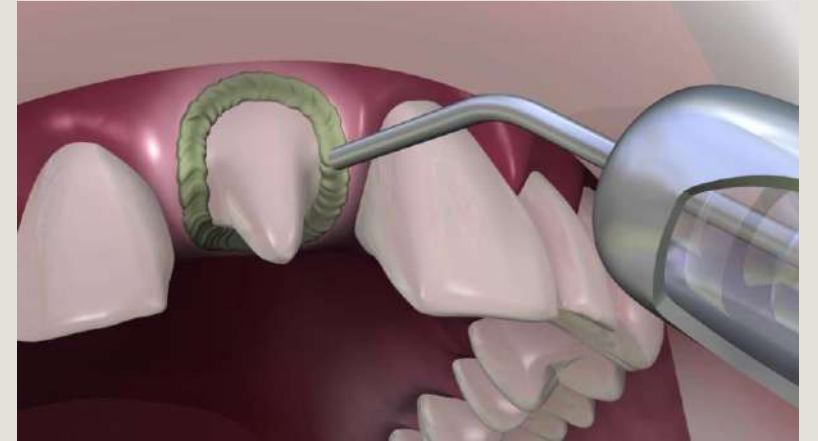


**Figure 4: Impression**

# EXPASYL RETRACTION PASTE

## MECHANISM OF ACTION

- It has both mechanical & chemical action
- Kaolin – creates & maintains space in sulcus due to its optimal characteristics of its viscosity
- $AlCl_3$  – provide hemostasis
- When Expasyl is left in place for 1 minute, the pressure is sufficient to obtain sulcus opening of 0.5 mm for 2 minutes



# EXPASYL RETRACTION PASTE

Advantages	Disadvantages
Effectively achieves hemostasis	Expensive
Little pressure – atraumatic (0.1 N/mm)	Allergic reactions
Less time consuming	Metal tips too big for interproximal area
Easy removal	Less effective with very subgingival margins.
Easy to dispense	

## Comparison of gingival retraction produced by retraction cord and expasyl retraction systems - An *in vivo* study

Ashish R Jain, Deepak Nallaswamy

### ABSTRACT

**Statement of Problem:** A gingival retraction system may be soft tissue friendly or could be easy to use or could be the tried and tested one. However, when compared to the results they produce, the clinical application is questioned. **Aim:** The aim of this study is to evaluate the amount of gingival retraction produced by expasyl retraction paste and plain retraction cord. **Methods and Materials:** This study included 39 subjects. After abutment, teeth were prepared for fixed partial denture, plain retraction cord or expasyl retraction paste was placed into the sulcus of the prepared teeth, and time taken for application was recorded and bleeding was noted after removal of retraction material. Gingival sulcus width was measured by travelling microscope. The gingival recession was measured using digital caliper. **Results:** The mean gingival width of retracted sulcus in both the groups showed no statistically significant difference between the two ( $P < 0.05$ ). The mean time taken for application and hemorrhage of expasyl paste (99.34 min, 5.1% bleeding) was significantly less than plain retraction cord (221.89 min, 74.4% bleeding). In both phases, the gingival index and gingival recession in the cord group were significantly higher than expasyl paste group. **Conclusion:** From the study results, amount of gingival retraction with the use of expasyl retraction paste is almost similar in comparison to plain retraction cord; expasyl retraction system appears to produce less hemorrhage and needs less clinical time for application. The effect of retraction system on soft tissue health (plaque index, bleeding on probing, and mean gingival recession) in the expasyl paste group was significantly better than cord group. **Clinical Significance:** Retraction with expasyl paste producing similar amount of lateral displacement of the gingival margin, therefore based on the beneficial effects, it may be recommended for absorption of intraoral fluids and exerting moderate pressure on gingival tissue.

- Amount of gingival retraction with the use of expasyl
- retraction paste is almost similar in comparison to plain retraction cord.
- Expasyl retraction system appears to produce less
- hemorrhage and needs less clinical time for application.
- The effect of retraction system on soft tissue health (plaque index,
- bleeding on probing, and mean gingival recession) in the expasyl paste group was significantly better than cord group.

# COMPRES CAP



- Compre cap anatomic – anatomically formed compression caps
- Thin & firm walls & a deep hollow – easy to place
- Patient bites on the cap for 3-5 minutes once it is placed
- Pressure exerted retracts the gingival tissue
- Used along with foam cord



# MAGIC FOAM CORD



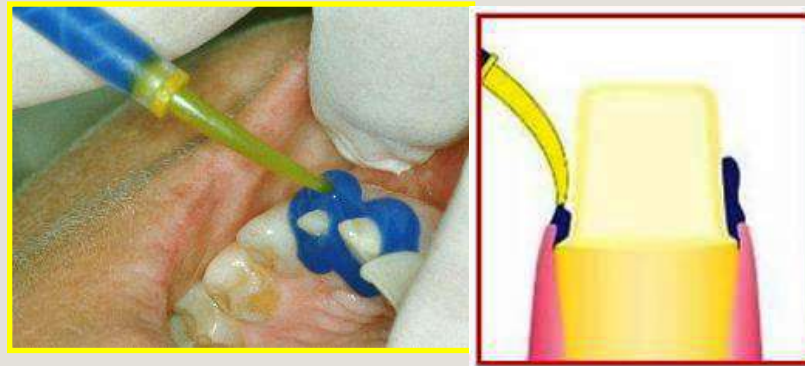
- Introduced by Dr. Dumfahrt, Coltene/ Whaledent
- Non Hemostatic method
- Expandable vinyl polysiloxane material
- No astringent is required



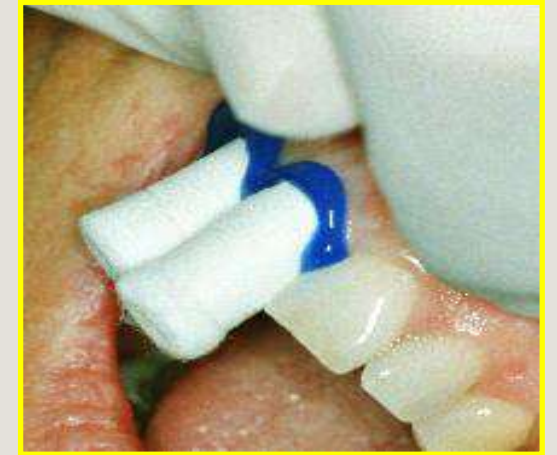
# MAGIC FOAM CORD



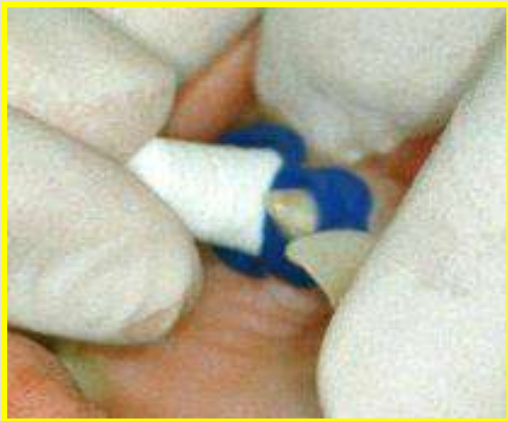
Pre fit the Compre cap



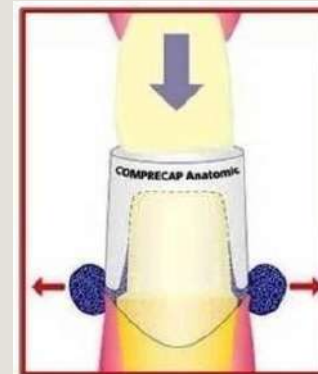
Apply Magic foam cord around the preparation



Place Compre cap anatomic



Let the pt bite on Compre cap



Remove Compre cap

# MAGIC FOAM CORD

- Action time: 3 to 5 minutes
- Material has an expansion of 160% after 5 minutes

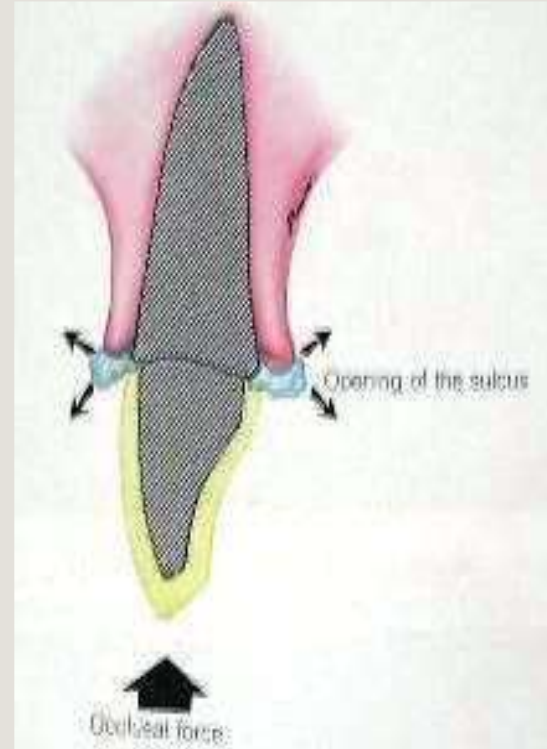
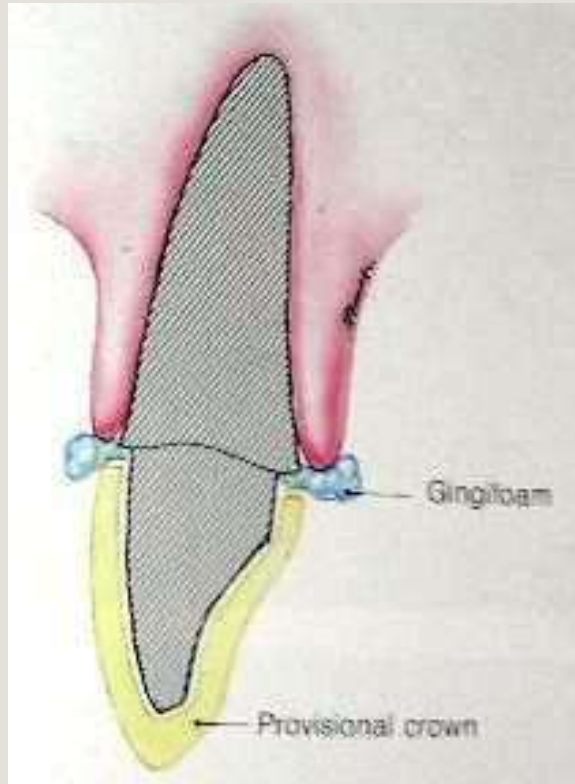
Advantages	Disadvantages
1. Less traumatic	1. Expensive
2. Easy to use	2. No hemostatic action
3. Extensive rinsing is not required	3. Less effective on subgingival margins
4. Easy removal	
5. Adequate working time	
6. Good colour contrast	

# GINGIFOAM

- Introduced by Martignoni & Feinman
- It is a modified silastic, which is capable of dilating gingival sulcus
- It has 2 components:
  - A polydimethyl siloxane base
  - A Tin based catalyst

Advantages	Disadvantages
1. Non irritant	1. Expensive
2. Absorbs fluid	2. No hemostatic action
3. Extensive rinsing is not required	3. Moderate gingival displacement

# GINGIFOAM



# GINGITRAC

- Paste retraction system
- Introduced by Centrix
- Based on vinyl polysiloxane material with aluminum sulfate astringent
- Action time: 3 to 5 minutes



Advantages	Disadvantages
1. Easier to express from automix gun	1. Expensive
2. Longer shelf life	2. No hemostatic action
3. Faster setting time	
4. Control oozing of blood	
5. Fast & easy removal	



# MEROCEL RETRACTION STRIPS

- Introduced by Marco Ferrari et al in 1996
- Synthetic, biocompatible polymer – hydroxylate polyvinyl acetate

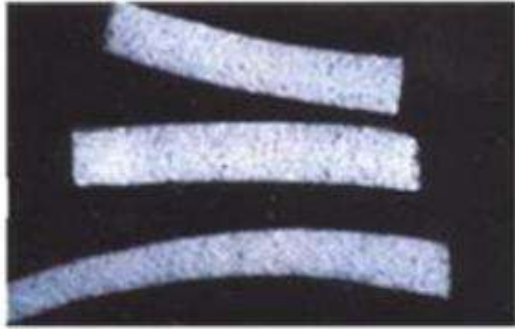
## Mechanism of action:

Strip expands by absorption of oral fluids & exerts pressure on surrounding tissue

Advantages	Disadvantages
1. Less traumatic	1. Expensive
2. Does not require local anesthesia	2. No hemostatic action
3. Shaped easily	
4. Effectively absorbs oral fluids	
5. Cleans sulcus	
6. Effective on subgingival margins	



# MEROCEL RETRACTION STRIPS



**Figure 5: Merocel retraction strip**



**Figure 6: Tooth Initially prepared**



**Figure 7: Merocel used as a retraction device**



**Figure 8: Maintain pressure for 10 min**

# Comparative Study on the Efficacy of Gingival Retraction using Polyvinyl Acetate Strips and Conventional Retraction Cord – An in Vivo Study

M. SHIVASAKTHY<sup>1</sup>, SYED ASHARAF ALI<sup>2</sup>

## ABSTRACT

**Statement of Problem:** A new material is proposed in dentistry in the form of strips for producing gingival retraction. The clinical efficacy of the material remains untested.

**Purpose of the Study:** This study aimed to determine whether the polyvinyl acetate strips are able to effectively displace the gingival tissues in comparison with the conventional retraction cord.

**Material and Methods:** Complete metal ceramic preparation with supra-gingival margin was performed in fourteen maxillary incisors and gingival retraction was done using Merocel strips

and conventional retraction cords alternatively in 2 weeks time interval. The amount of displacement was compared using a digital vernier caliper of 0.01mm accuracy. Results were analyzed statistically using Paired students t-test.

**Results:** The statistical analysis of the data revealed that both the conventional retraction cord and the Merocel strip produce significant retraction. Among both the materials, Merocel proved to be significantly more effective.

**Conclusion:** Merocel strip produces more gingival displacement than the conventional retraction cord.

## Conclusion:

1. Merocel strip produces statistically significant amount of gingival retraction
2. When compared with the displacement produced by conventional cord, the displacement produced by the Merocel strip is significantly more
3. Both the materials and methods of displacement have not grossly affected the gingival health in 2 weeks follow-up

# GEL CORD

- Contain 25% Aluminum sulfate gel
- Indication : Class V restorations
- Provides lubrication for cord
- Brightly colored – better visualization



# STAT GEL

- Contain 15% ferric sulfate gel
- Tissue retraction & hemostasis



# TISSUE GOO



- Tissue retraction & hemostasis
- 25% Aluminum sulfate gel
- Act as a coagulant to arrest bleeding

# G CUFF

- Introduced by a Canadian company, Stomatotech
- A disposable plastic collar
- Mainly Used for impressions with implant abutment



# RETRACTION CAPSULE

- Introduced by 3M ESPE
- 15% Aluminium chloride retraction paste
- Delivered in to sulcus using fine plastic tips

**3M™ ESPE™**  
Retraction  
Capsule



# RACE GEL

- New hemostatic agent
- It is used to obtain hemostasis and dry field in the sulcus.
- Contains 25% aluminum chloride, oxyquinol
- Easily rinsed, leaving no irritation of the surrounding tissue



Suryakant C. Deogade, Sneha S. Mantri, Gunjan Dube, Radhika Shrivastava, Syed Noorani, "A New Trend in Recording Subgingival Tissue around an Implant While Making a Direct Abutment Impression", *Case Reports in Dentistry*, vol. 2014, Article ID 847408, 6 pages, 2014.

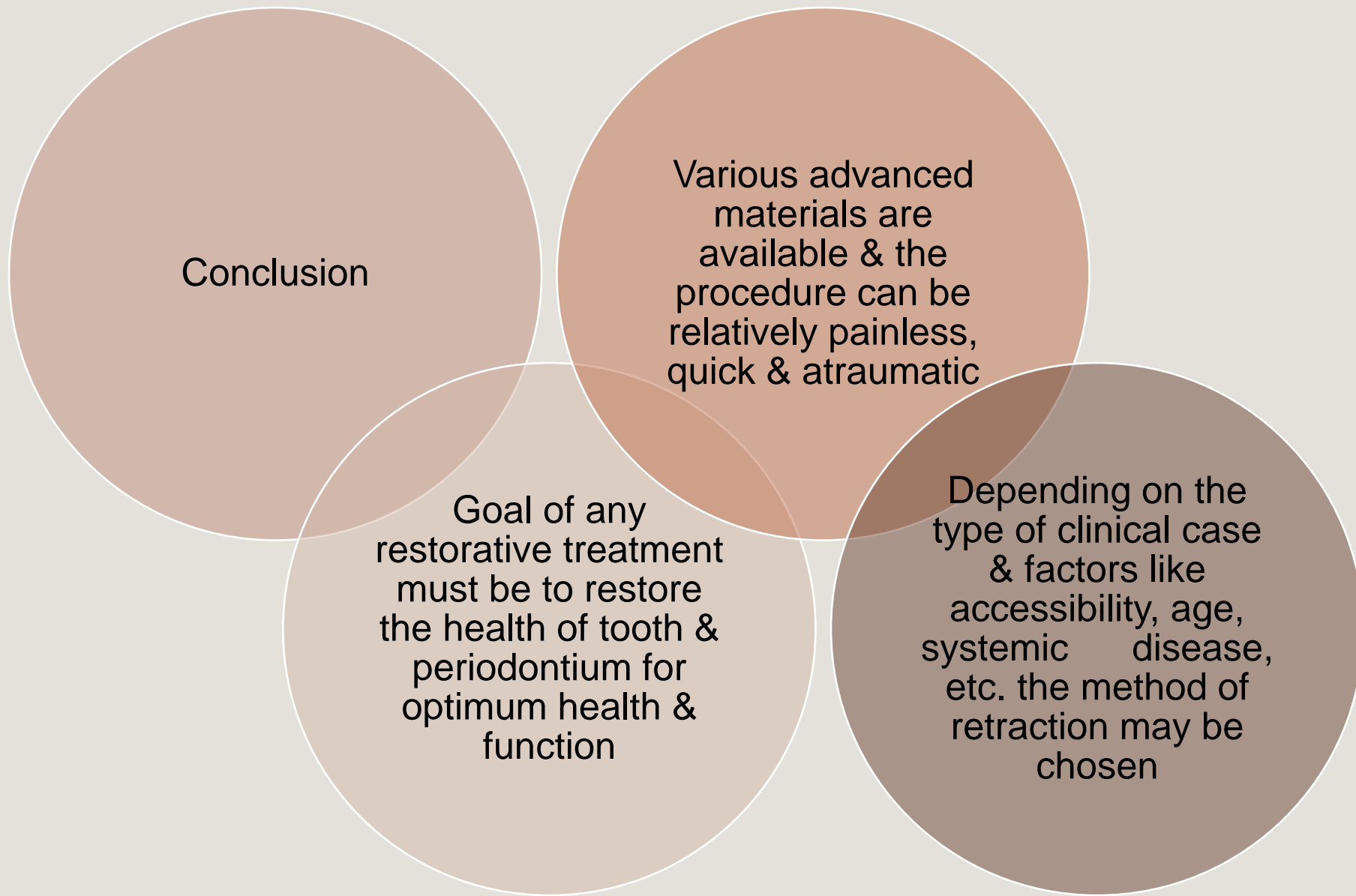
# STAY PUT RETRACTION CORDS

- Combines the advantages of both an impregnated and braided cord with the adaptability of an ultrafine copper filament
- Aluminum chloride hexahydrate is used for impregnation

## Advantages:

- Haemostasis is fast
- Possible to be preshaped
- Pliable and easily adapted
- Relatively safe for cardiac patients





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**THANK**  
*YOU*

