



Moisture Control & Isolation of Working Field

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วัตถุประสงค์การเรียนรู้

หลังการเรียนการสอน นักศึกษามีความเข้าใจและอธิบายได้เกี่ยวกับ

1. จุดประสงค์, ข้อบ่งชี้ และประโยชน์ของการควบคุมความชื้น และการแยกบริเวณปฏิบัติงาน
2. อุปกรณ์ และวิธีการต่างๆ สำหรับการควบคุมความชื้น และการแยกบริเวณปฏิบัติงาน
3. ข้อควรระวังในทำการควบคุมความชื้น และการแยกบริเวณปฏิบัติงาน
4. นำความรู้ไปประยุกต์ใช้สำหรับปฏิบัติการ และคลินิกได้อย่างถูกต้อง

Sources of moisture in oral cavity

- Saliva
- Gingival crevicular fluid
- Blood contamination
- Breath
- Water contamination : water coolant, water spray

Benefits of moisture control

- Convenience & Efficiency
- Visibility
- Enhance efficiency of diagnosis
- Asepsis
- Reduce risk of inhalation and ingestion of debris, restorations, instruments and irrigants.
- Development of full properties in the materials used

THE CHANGE OF COMPRESSIVE STRENGTH WITH TIME OF AMALGAM
WITH AND WITHOUT CONTAMINATION (Kg/cm²)

Alloys	Time after mixing				
Lunaalloy	60 min	7 d	60 d	120 d	180 d
Uncontaminated	1274 (28)	3654(111)	3702(104)	3965(107)	3965(127)
Contaminated	1260 (45)	3455 (215)	3415 (175)	3503 (96)	3631 (183)

J Dent Res 60(3):716-723, March 1981

Effect of saliva contamination on bond strength of self-etch adhesives

TABLE 2

MEAN SHEAR BOND STRENGTHS OF ENAMEL GROUPS.			
ENAMEL GROUP	NO. OF TEETH	MEAN SBS (MPa)*	STANDARD DEVIATION
Group 1: No Saliva Contamination (Control)	20	19.1	± 4.8
Group 2: Saliva Contamination Before Application of Self-etching Adhesive System	20	12.3 [†]	± 4.4
Group 3: Saliva Contamination After Application of Self-etching Adhesive System	20	13.1 [†]	± 5.5
* SBS: Shear bond strength, MPa: megapascals. † Groups are not statistically different from each other ($P > .05$).			

Johnson ME, Burgess JO, Hermes CB, Buikema DJ.
 Saliva contamination of dentin bonding agents.
 Oper Dent. 1994 Nov-Dec;19(6):205-10.

Methods of moisture control

- Absorbents
- Saliva ejector and High power suction
- Air-Water Syringe
- Retraction Cord
- Chemical agents
- Surgical methods
- Rubber dam set

Absorbents



Cotton roll

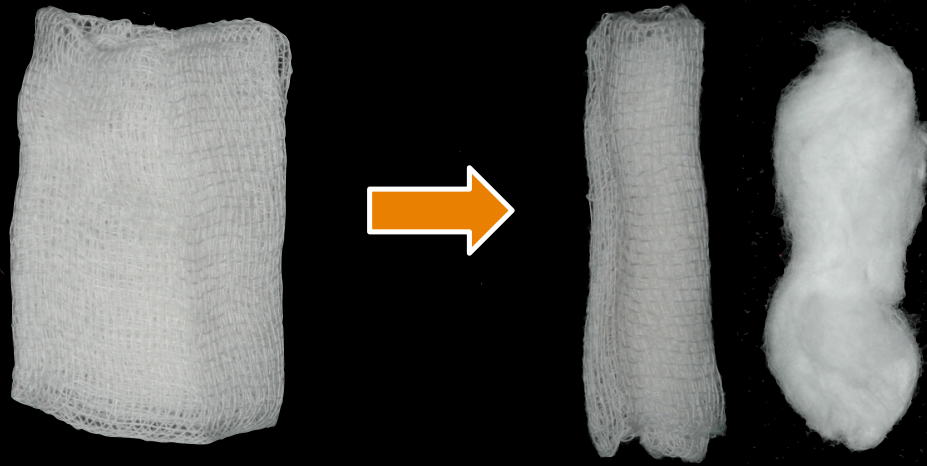


Gauze pad



Cellulose wafer

Cotton roll and Gauze



Formed, pre-shaped cotton/gauze positioned close to the salivary gland ducts absorbs the flow of saliva and excess water.

Cotton roll and Gauze

Advantages:

- Easy to use.
- No additional equipment is required.
- Flexible and can be adapted to fit areas of the mouth.

Cotton roll and Gauze

Disadvantages:

- Does not provide complete isolation.
- Does not protect the patient from aspiration.
- May stick to the oral mucosa and can injure it.
- It must be replaced frequently because of saturation.
- Limited retraction.

Placement of cotton roll



Placement of cotton roll



Placement of cotton roll





Cotton roll holder



15 Minute
Control of the
Entire Parotid
Area!

Cellulose wafer

**"OUCHLESS"
COMFORT EDGE®**

New technology creates a soft, flexible edge while retaining product integrity.

**GENTLE TO THE
BUCCAL MUCOSA**

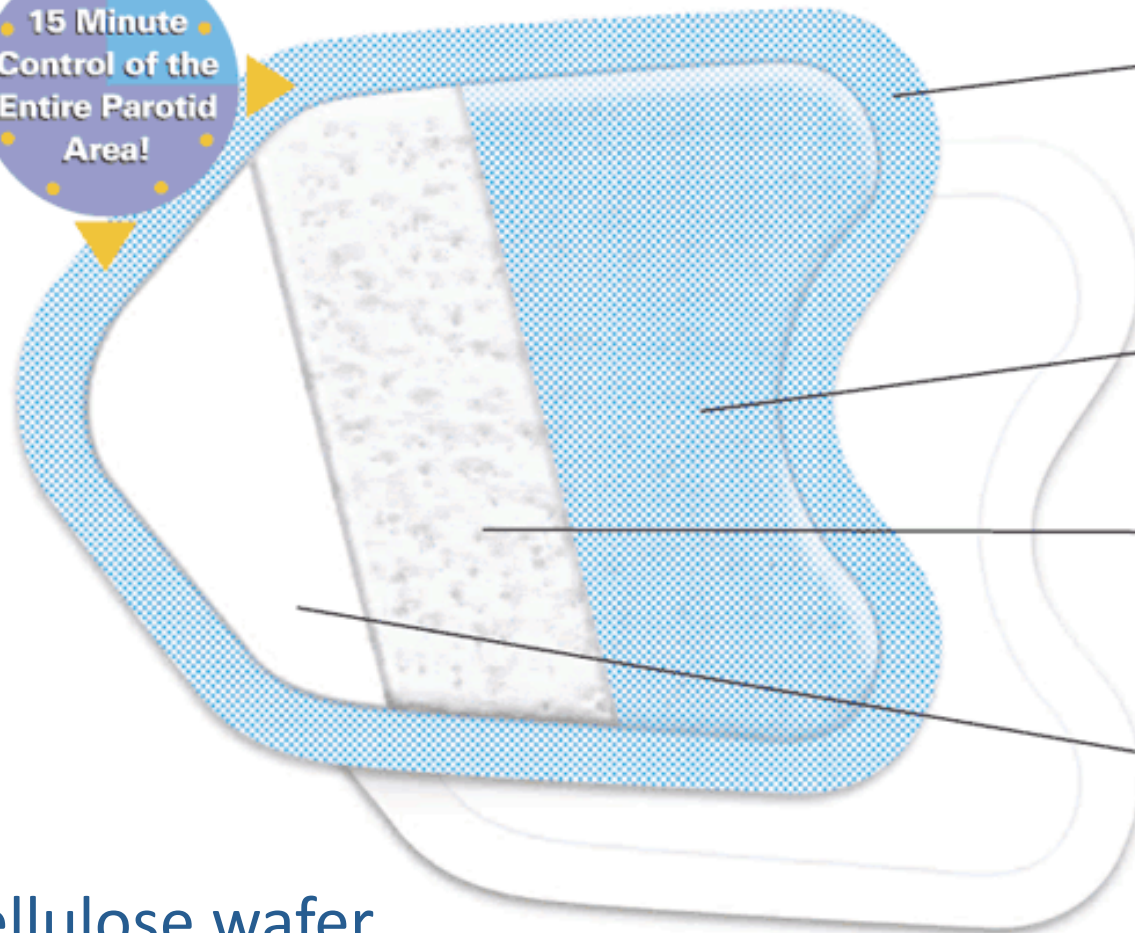
Medical-grade poly netting adheres gently to tissue.

SUPER ABSORBENT CORE

Acrylate polymer retains moisture as a gel when in contact with saliva.

CORE STIFFENER

Poly stiffener insert provides optimum rigidity for cheek retraction.



Cellulose wafer

A triangular absorbent pad placed over the Stensen's duct blocks the flow of saliva and protects the tissues in this area.





Saliva Ejector and High Power Suction

Saliva ejector

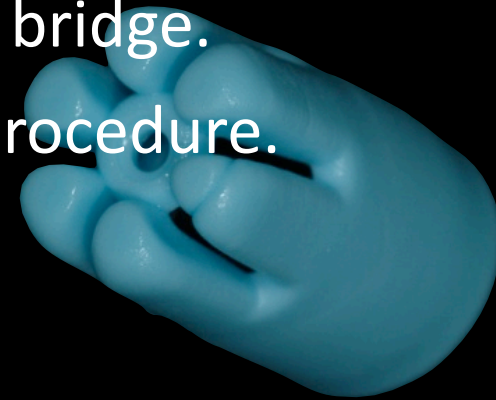


Small, straw-like oral evacuator used during less invasive dental procedures.

Saliva ejector

Indications for use:

- Preventive procedures such as a prophylaxis or fluoride treatments.
- Helps control saliva and moisture accumulation under the dental dam.
- For the cementation of crown or bridge.
- During an orthodontic bonding procedure.



Saliva ejector

Placement of saliva ejector

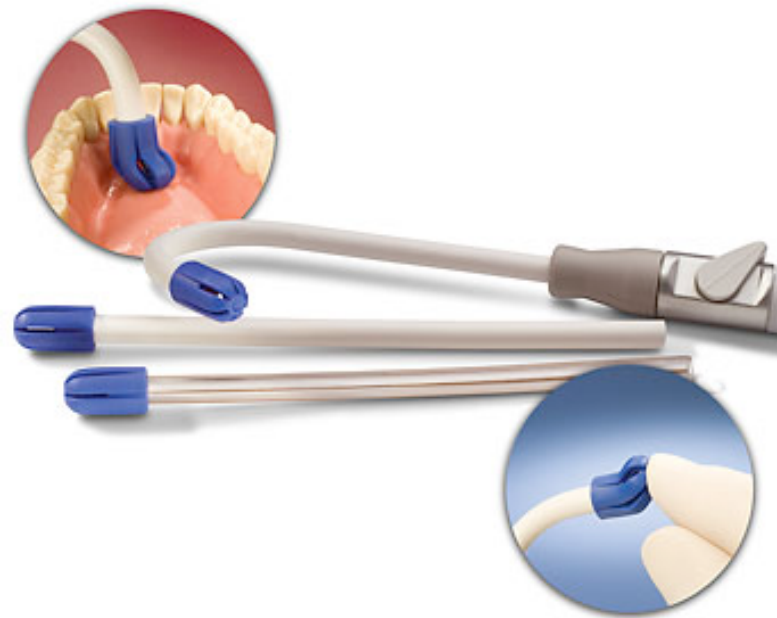
- Bend and shape saliva ejector for placement.
- Position under the tongue.
- Position saliva ejector opposite the side on which the dentist is working.



Saliva ejector



ColorFlex Saliva Ejectors



Total-Comfort Soft Tip Aspirators

Saliva ejector



SweFlex Saliva Ejector Tips



Mirror-Vac Saliva Ejector Mirrors

Saliva ejector



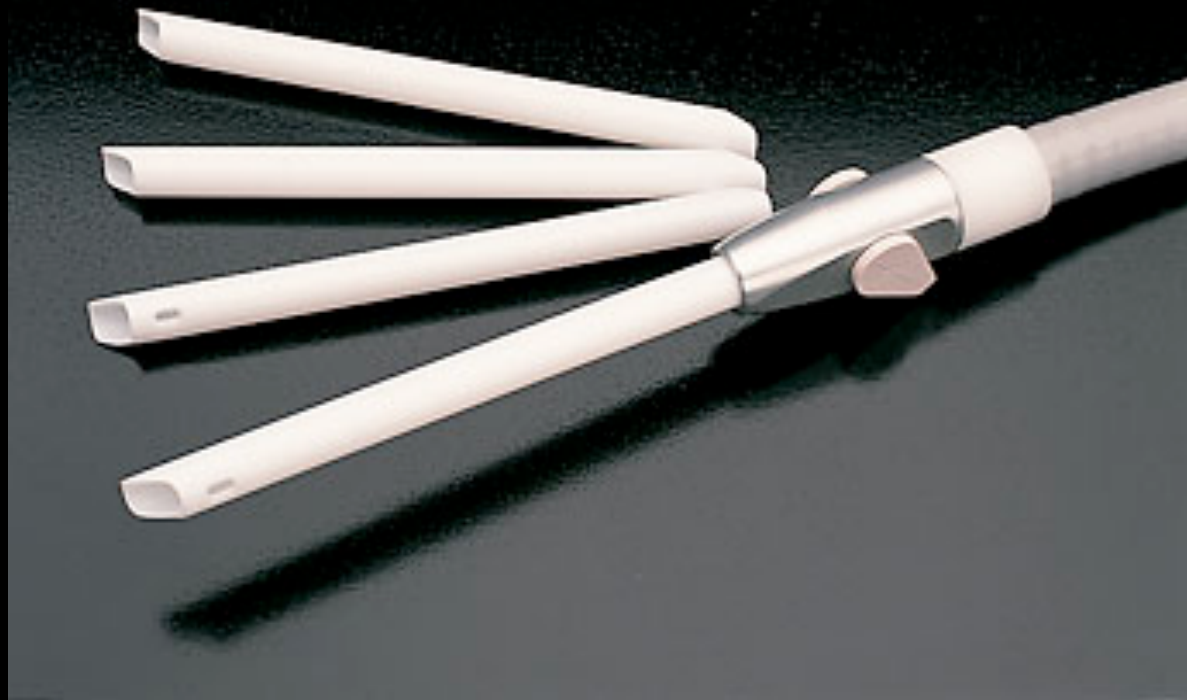
Fast Dams
Anatomical Fast Dam maintains dry
quadrant field



LM-MultiSeptor

High power suction

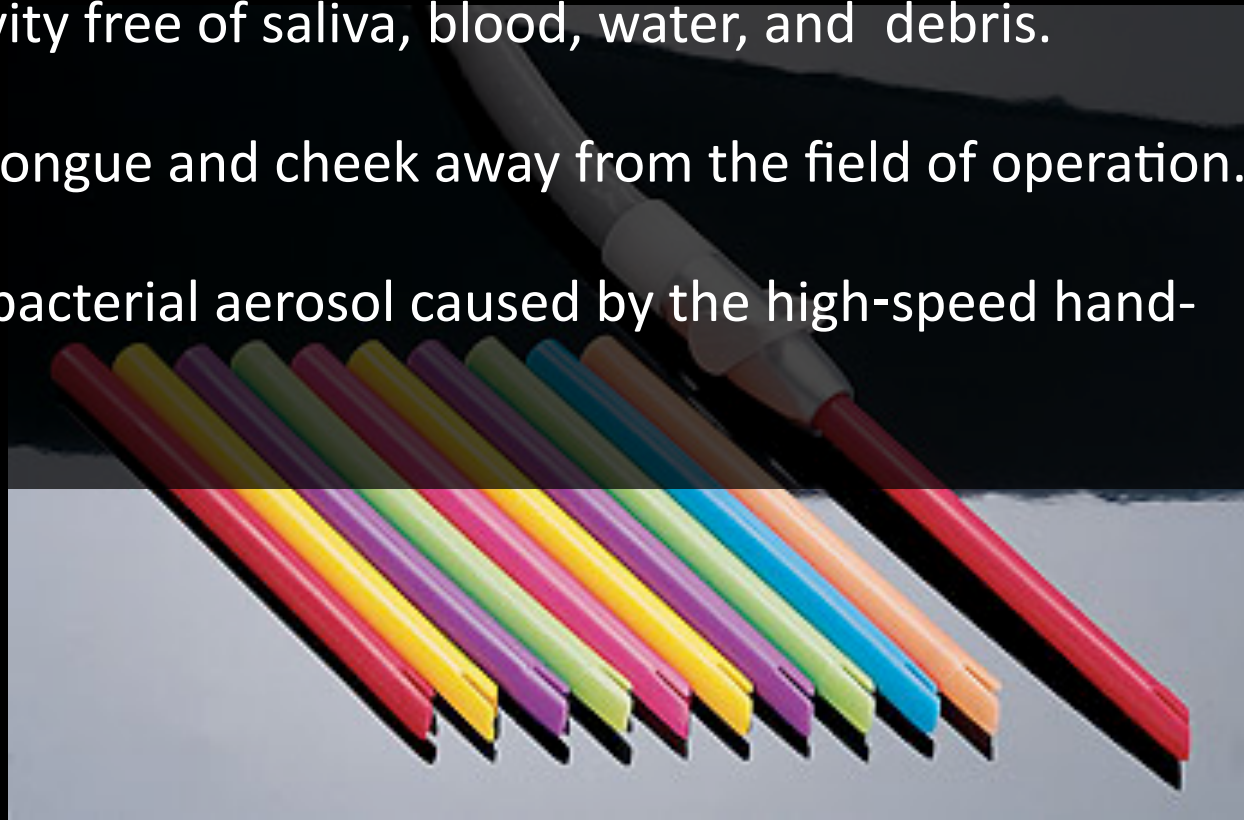
Used for most dental procedures, especially when the dental hand-piece is in use.



High power suction

Indications for use

- Keep oral cavity free of saliva, blood, water, and debris.
- Retracts the tongue and cheek away from the field of operation.
- Reduces the bacterial aerosol caused by the high-speed hand-piece.



High power suction

Operative suction tips

- Designed with a straight or slight angle in the middle.
- Beveled working end.



Surgical suction tips

- Much smaller in circumference.

Placement of High power suction

- Place the evacuator prior to the dentist positioning the hand-piece and mouth mirror.
- Position the tip as close to the tooth being worked on.
- Position the bevel of the tip so that it is parallel to the tooth surface.
- Keep the edge of the tip even or slightly lower than the occlusal or incisal edge.





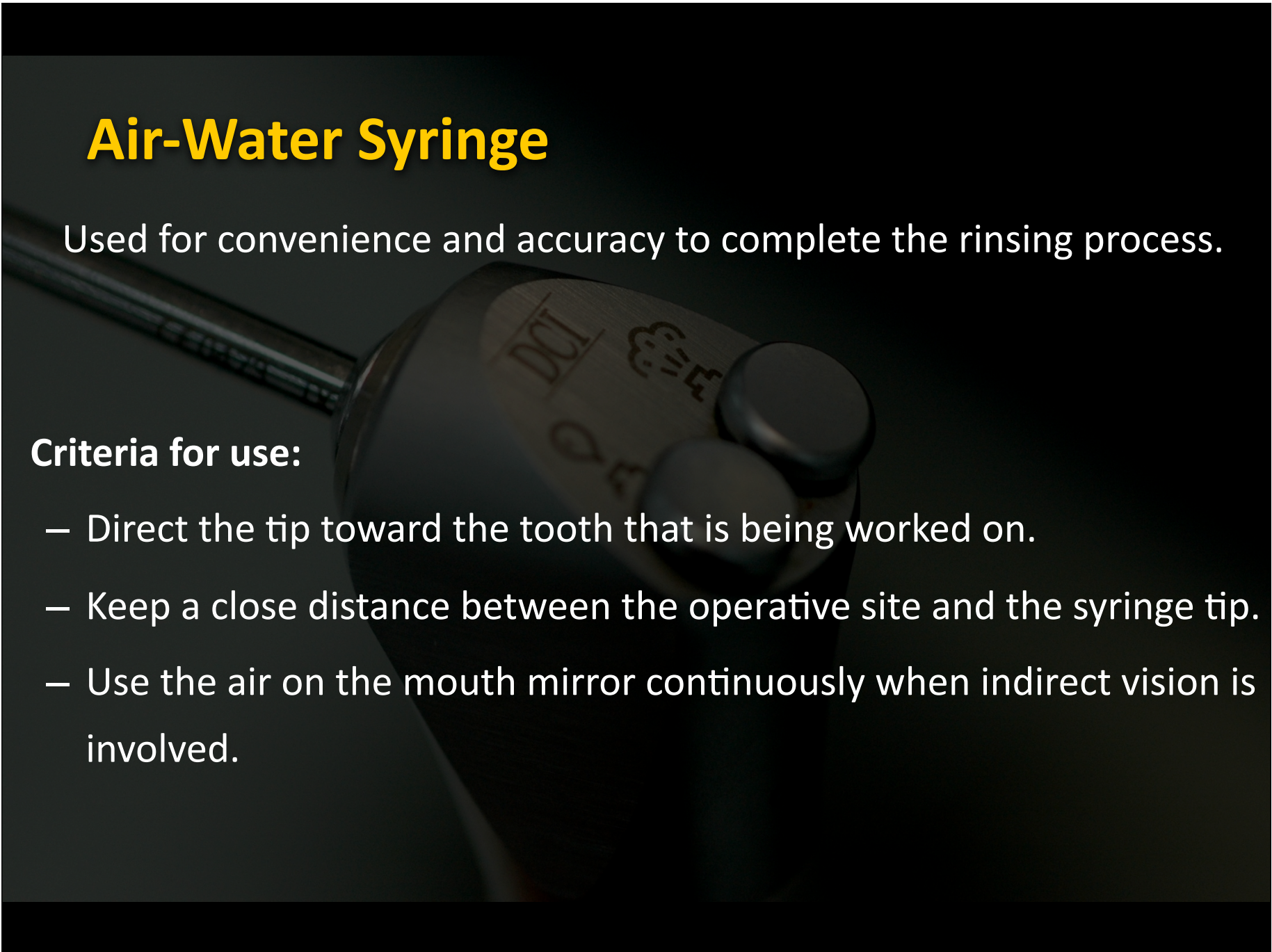
Air-Water Syringe

Air-Water Syringe

Used for convenience and accuracy to complete the rinsing process.

Criteria for use:

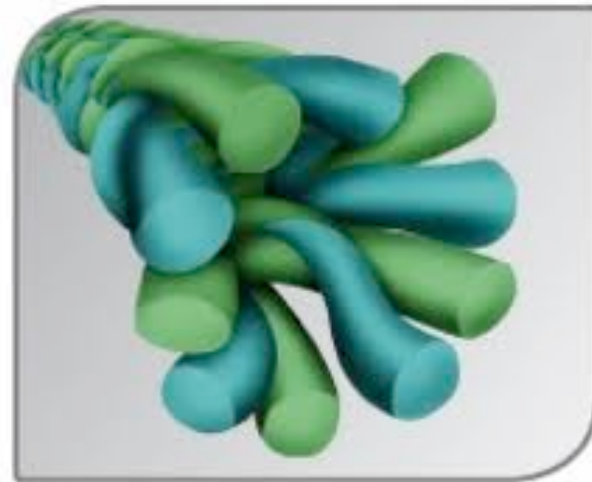
- Direct the tip toward the tooth that is being worked on.
- Keep a close distance between the operative site and the syringe tip.
- Use the air on the mouth mirror continuously when indirect vision is involved.



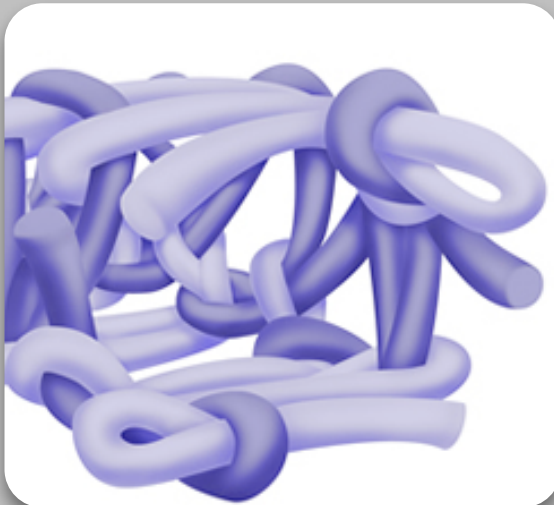
Twisted Retraction Cord



Braided Retraction Cord



Knit Retraction Cord



Gingival Retraction cord

#000 #00 #0 #1 #2 #3



thin gingival tissues



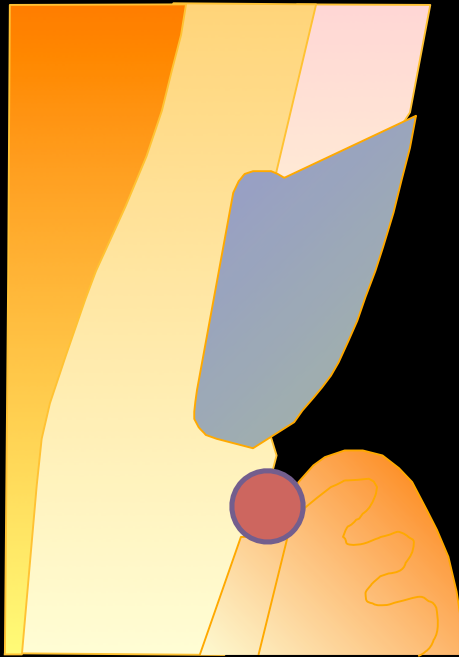
thick gingival tissues

Class III, IV and V restorations

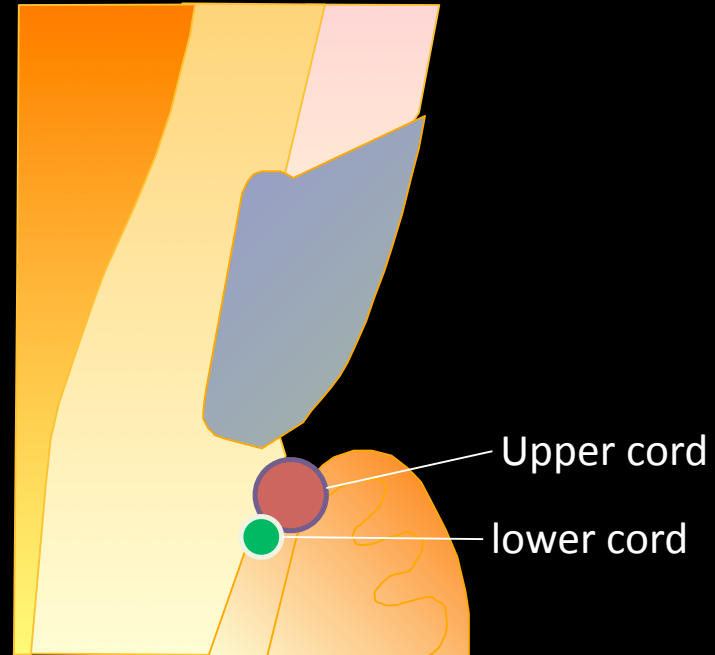
Anterior teeth, Veneers

Tissue control and/or displacement after crown preparations

Gingival Retraction cord

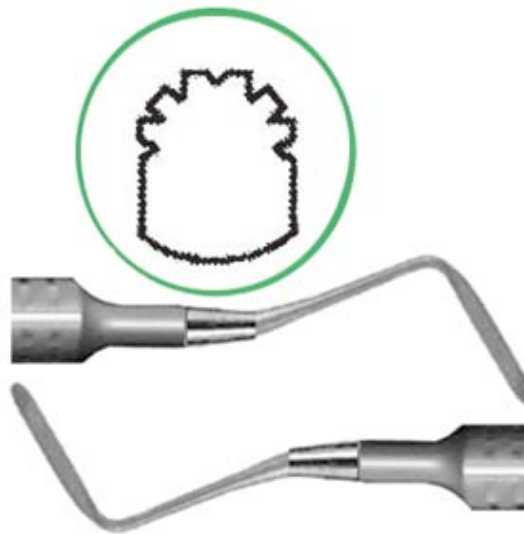


"one-cord" technique



"two-cord" technique

Gingival cord packer



Plastic instrument





Gingival Retraction cord



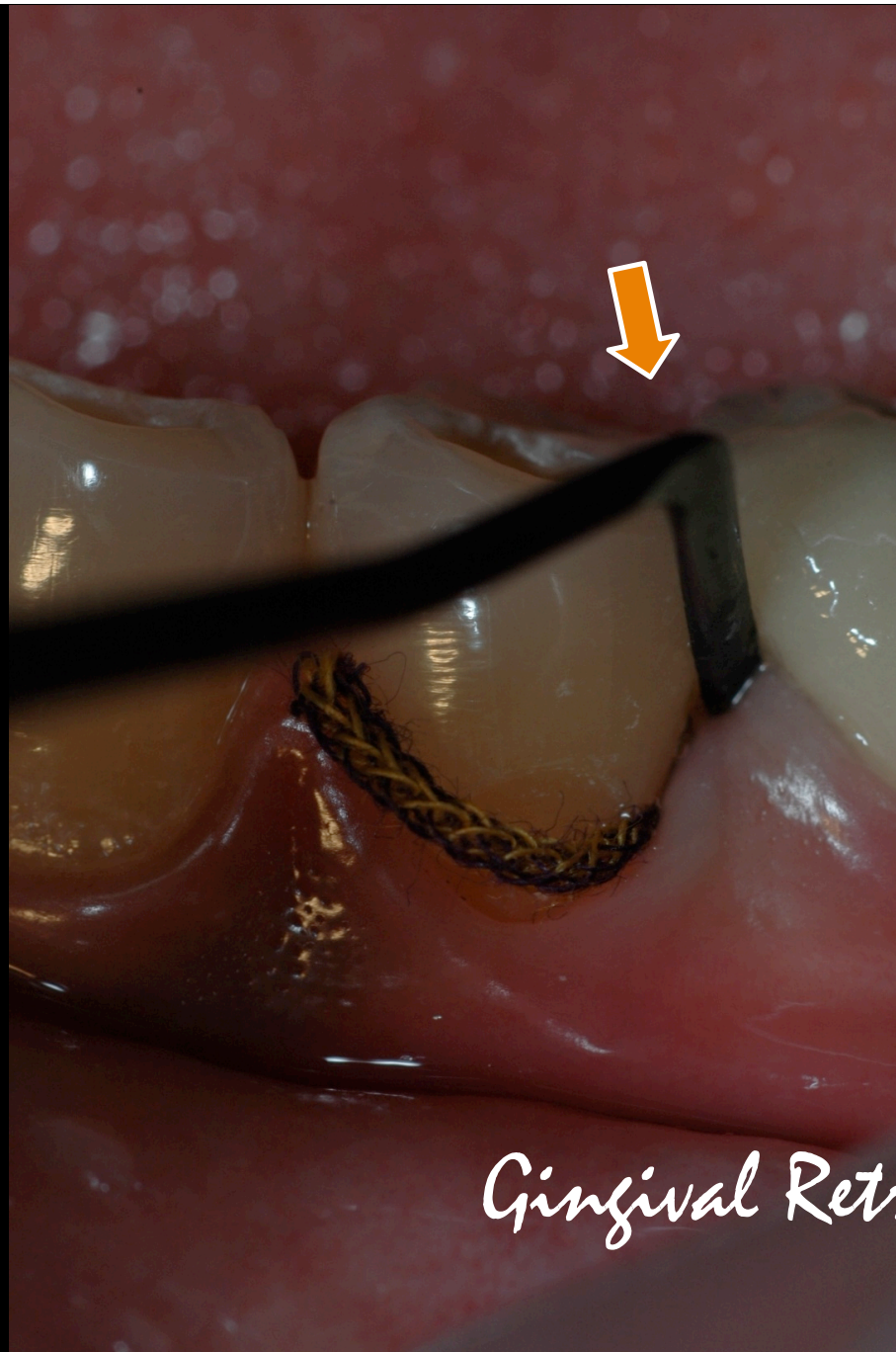
Gingival Retraction cord



Gingival Retraction cord



Gingival Retraction cord



Gingival Retraction cord



Gingival Retraction cord



Gingival Retraction cord



Gingival Retraction cord



Gingival Retraction cord



Gingival Retraction cord



Gingival Retraction cord



Gingival Retraction cord



Retraction cord should be wet before remove



Gingival Retraction cord



Gingival Retraction cord



Plain Retraction cord



Retraction cord with hemostatic agent

Epinephrine
Iron solution
Aluminum chloride
Ferric sulfate



Plain Retraction cord



Hemostatic agent

Epinephrine
Iron solution
Aluminum chloride
Ferric sulfate

Chemical agents

✱ Astringents - tissue contraction

- e.g. ALUM (Aluminum potassium sulfate)
- Aluminum sulfate, Zinc chloride, Tannic acid

✱ Hemostatic - protein coagulation

e.g. Ferric sulfate, Ferric chloride

✱ Vasoconstrictors

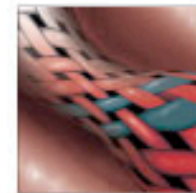
e.g. Epinephrine

Sympathomimetic amine

GingiBRAID+: Non-Impregnated (White cap)



GingiBRAID+: Non-Impregnated (White cap)



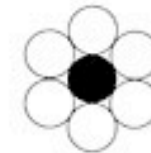
Available in:

0n, fine: white

1n, small: white w/purple strand

2n, medium: white w/green strand

3n, large: white w/pink strand



Astringents - tissue contraction

ALUM (Aluminum potassium sulfate)



GingiBRAID+: Aluminum Potassium Sulfate (Yellow cap)

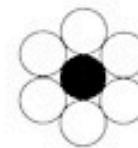
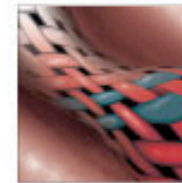
Available in:

0a, fine: yellow

1a, small: yellow w/purple strand

2a, medium: yellow w/green strand

3a, large: yellow w/pink strand



GingiBRAID+: Epinephrine/Alum 87 (Blue cap)

Impregnated and dried with a solution of approximately 8% racemic epinephrine (a vasoconstrictor) and 7% aluminum potassium sulfate (an astringent).



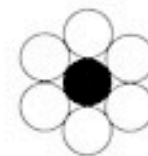
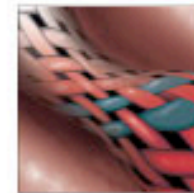
Available in:

0e, fine: blue

1e, small: blue w/purple strand

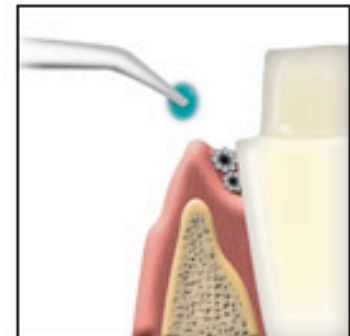
2e, medium: blue w/green strand

3e, large: blue w/pink strand





20% buffered aluminum chloride
lubricating hemostatic gel



20% buffered aluminum chloride lubricating hemostatic gel with saturated cotton pellets packaged in unique plastic cups with attached finger ring. Unit-Dose packaging eliminates cross-contamination. Light blue color indicates area of placement. The gel viscosity enhances placement and eliminates migration from the site. Cranberry flavor.

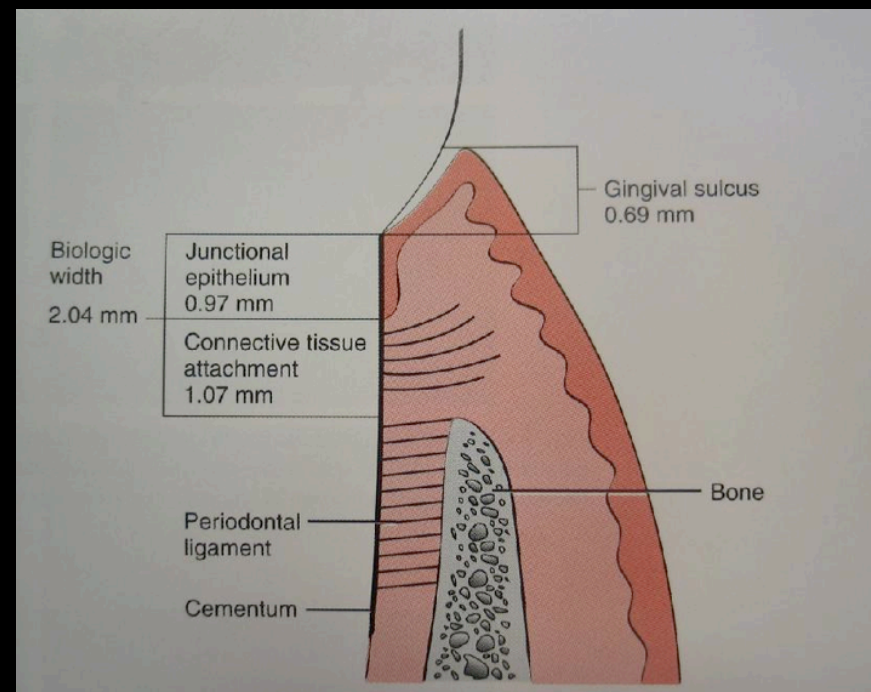


20% buffered aluminum chloride hemostatic solution

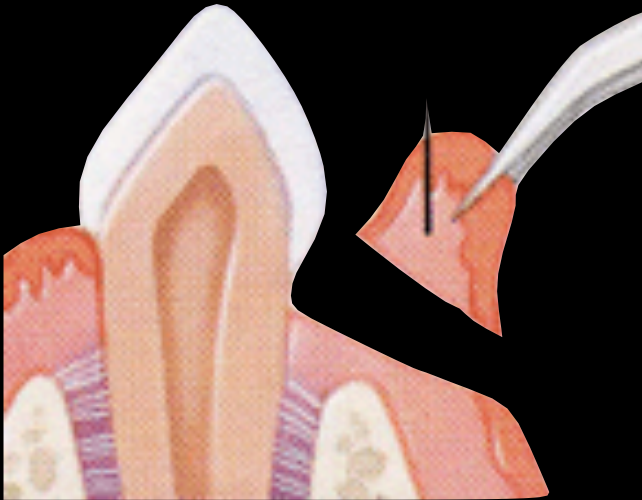
A fast-acting, 20% buffered aluminum chloride hemostatic solution in a lubricating base. The blue color shows the operator where the solution is placed. The increased viscosity prevents the solution from migrating from the site. Squeeze bottle allows easy dispensing and minimizes the possibility of cross-contamination. Cranberry flavor.

Surgical methods

- Gingivectomy
- Crown lengthening



Gingivectomy

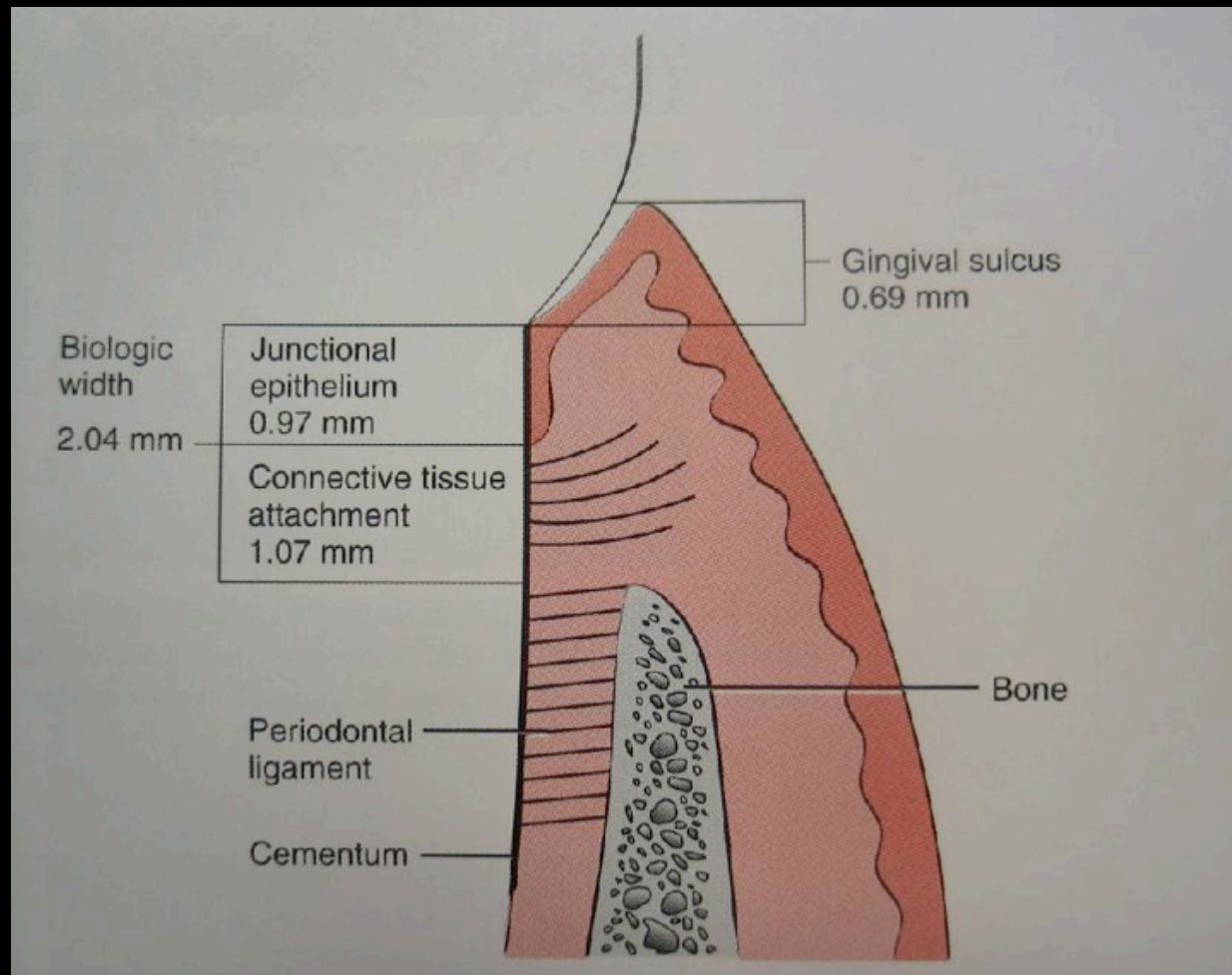




Gingivectomy

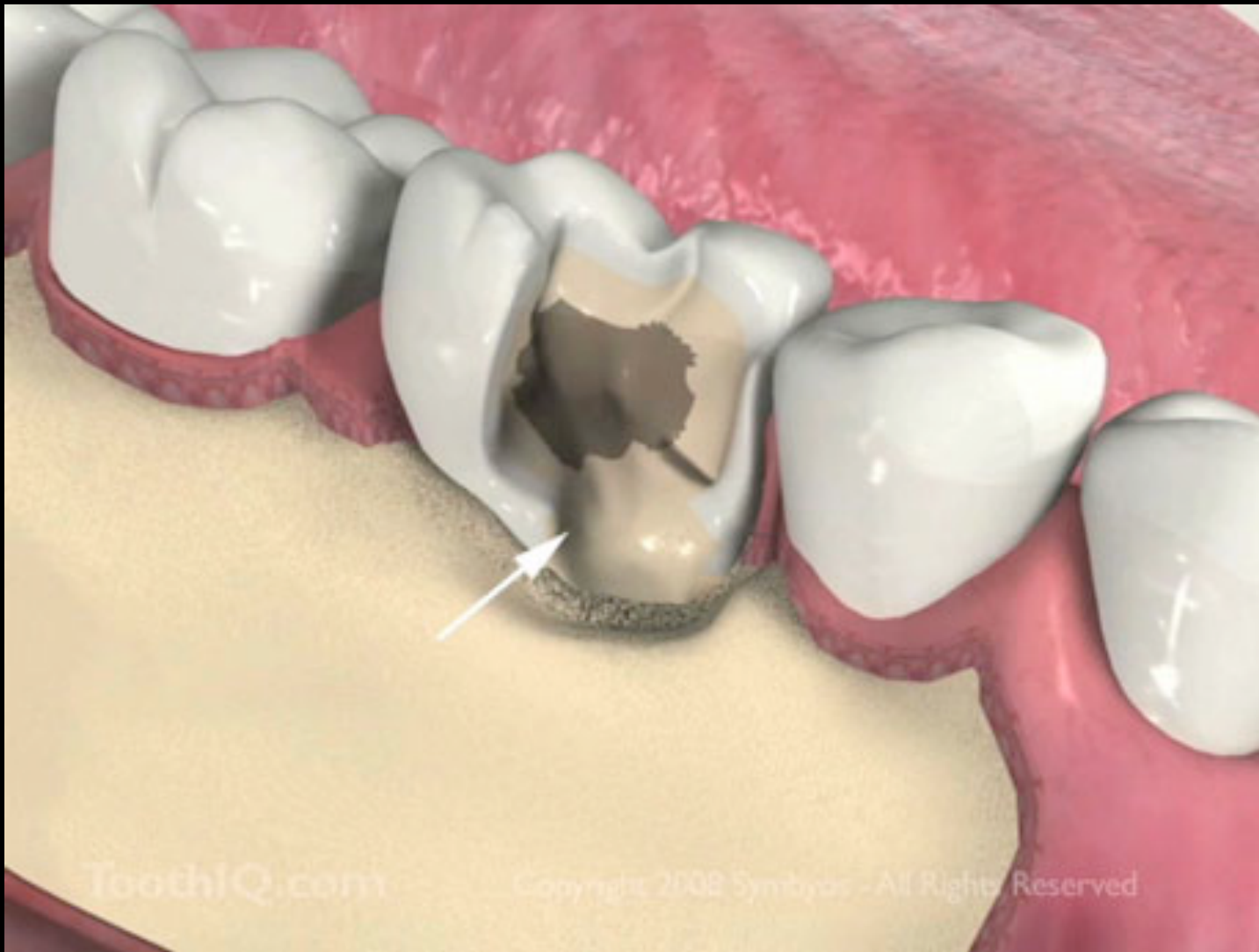


Gingivectomy with Electrosurgery





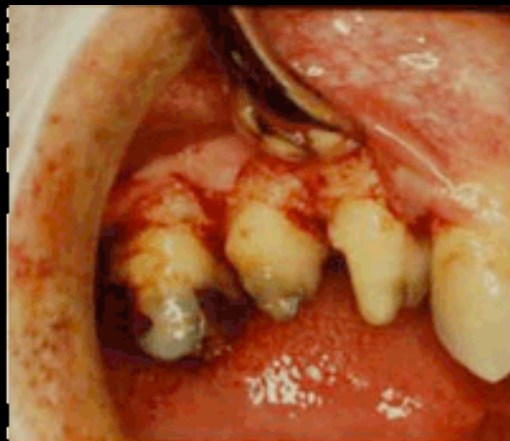
Crownlengthening



Crownlengthening



Crownlengthening



Crownlengthening

Conclusion

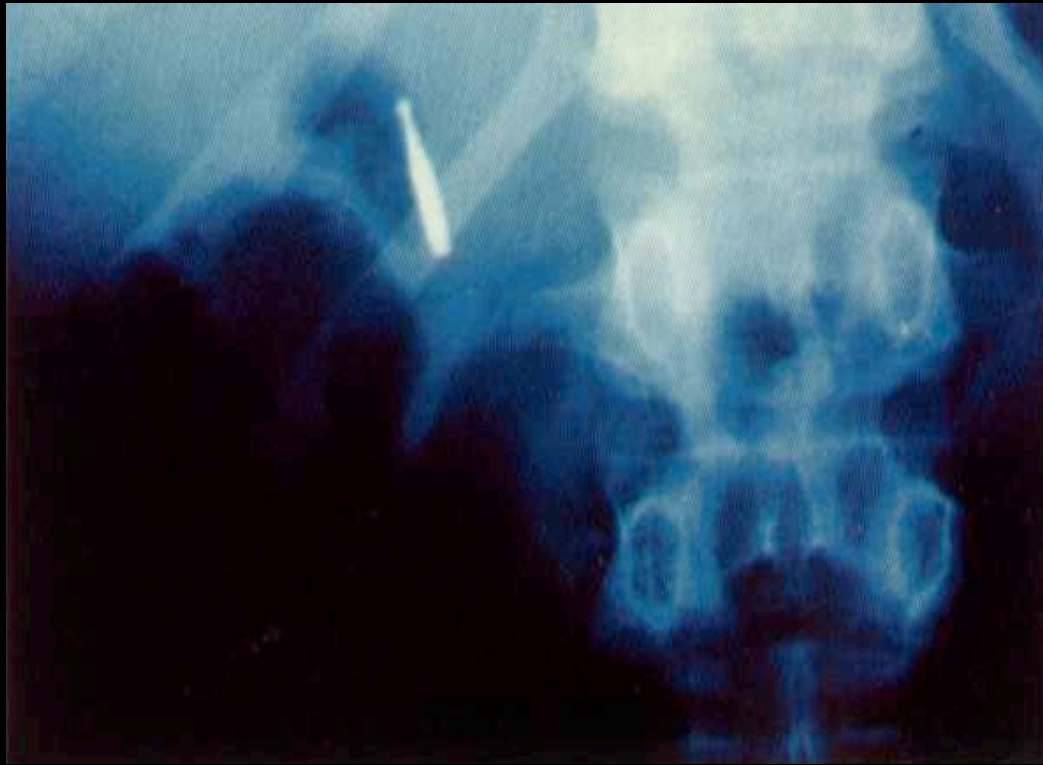
- Sources of moisture in oral cavity
- Benefits of moisture control
- Methods of moisture control
 - Absorbents
 - Saliva ejector and High power suction
 - Air-Water Syringe
 - Retraction Cord
 - Chemical agents
 - Surgical methods

Dental Rubber Dam

- **Indications for use**
 - Infection control protective barrier.
 - Safeguards the patient's mouth.
 - Protects the patient from accidentally inhaling or swallowing debris.
 - Protects the tooth from contamination.
 - Provides the moisture control needed.
 - Improves access.
 - Provides better visibility.
 - Increases dental team efficiency.





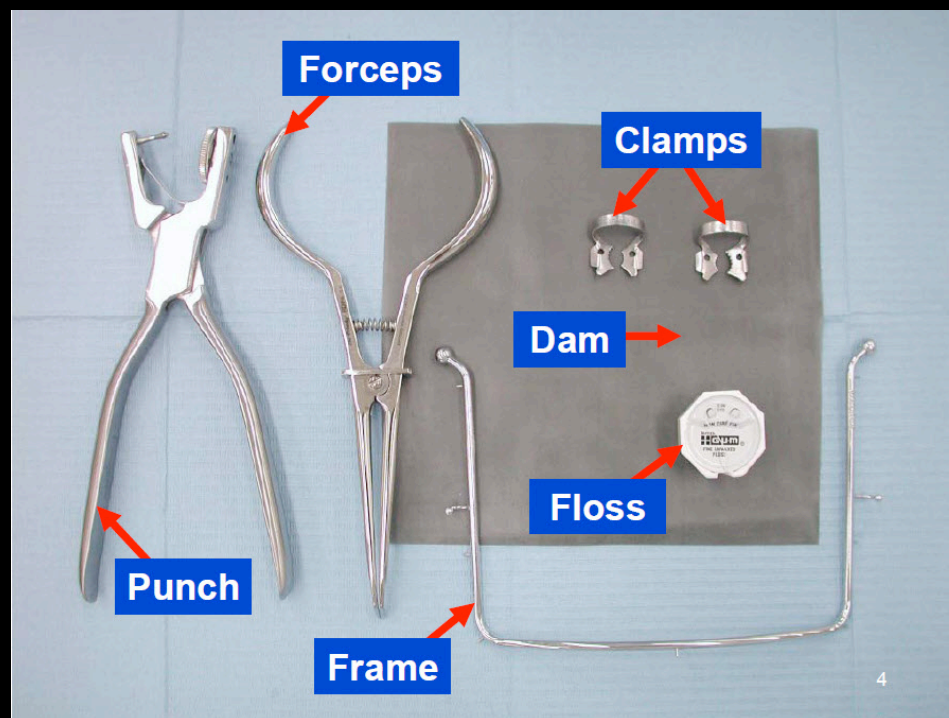


"A small round bur detached from the slow speed handpiece and lodged in patients' left bronchus..... The patient underwent a thoracotomy to retrieve the bur and was away from work for a considerable time. This case was settled for \$75,000."

Australian Dento-Legal Review 2002 Guild Insurance pp12

Rubber dam Set

- Rubber dam sheet
- Napkin
- Rubber dam punch
- Rubber dam template
- Rubber dam clamp
- Rubber dam forceps
- Rubber dam frame
- Lubricant

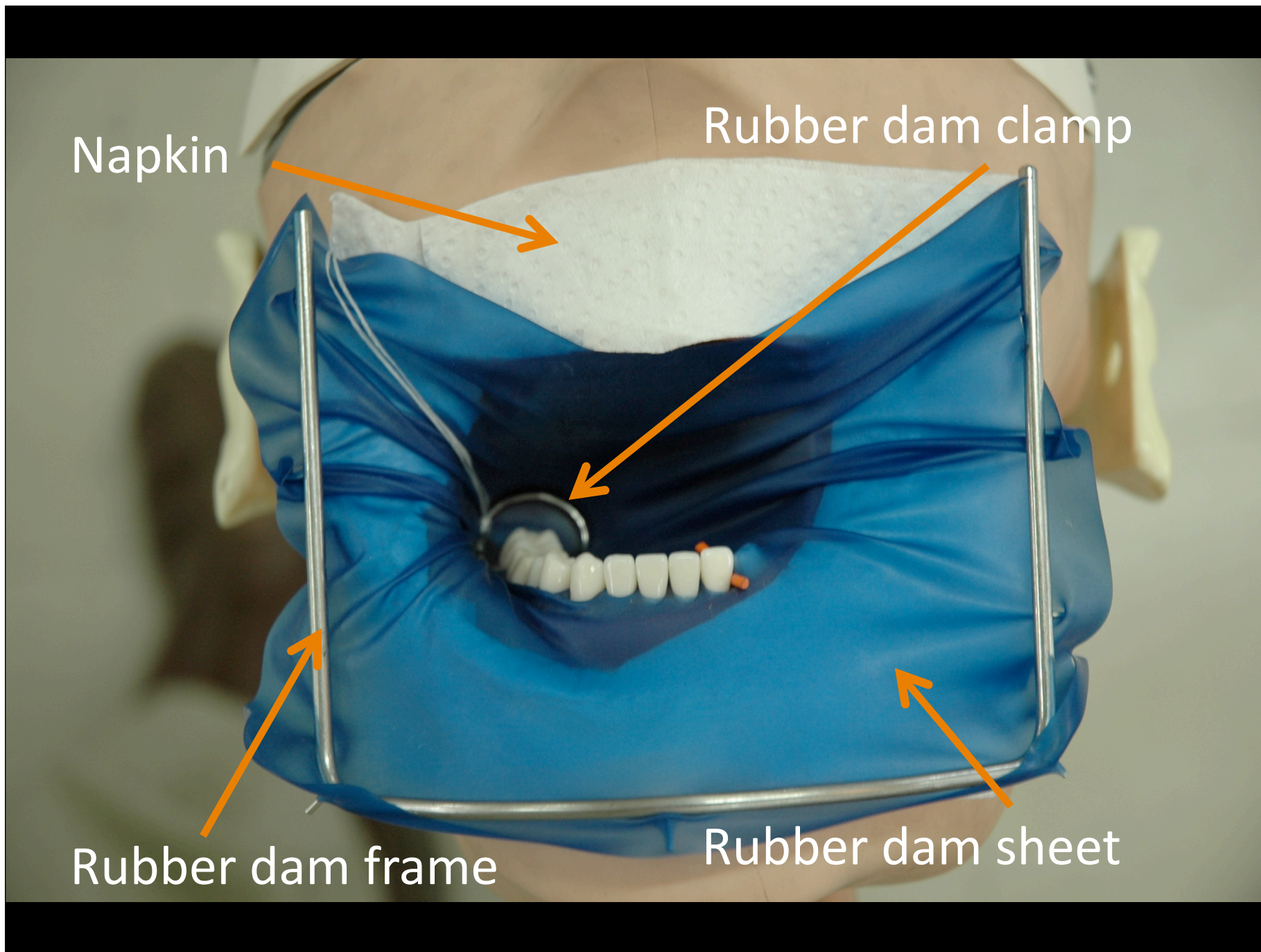


Napkin

Rubber dam clamp

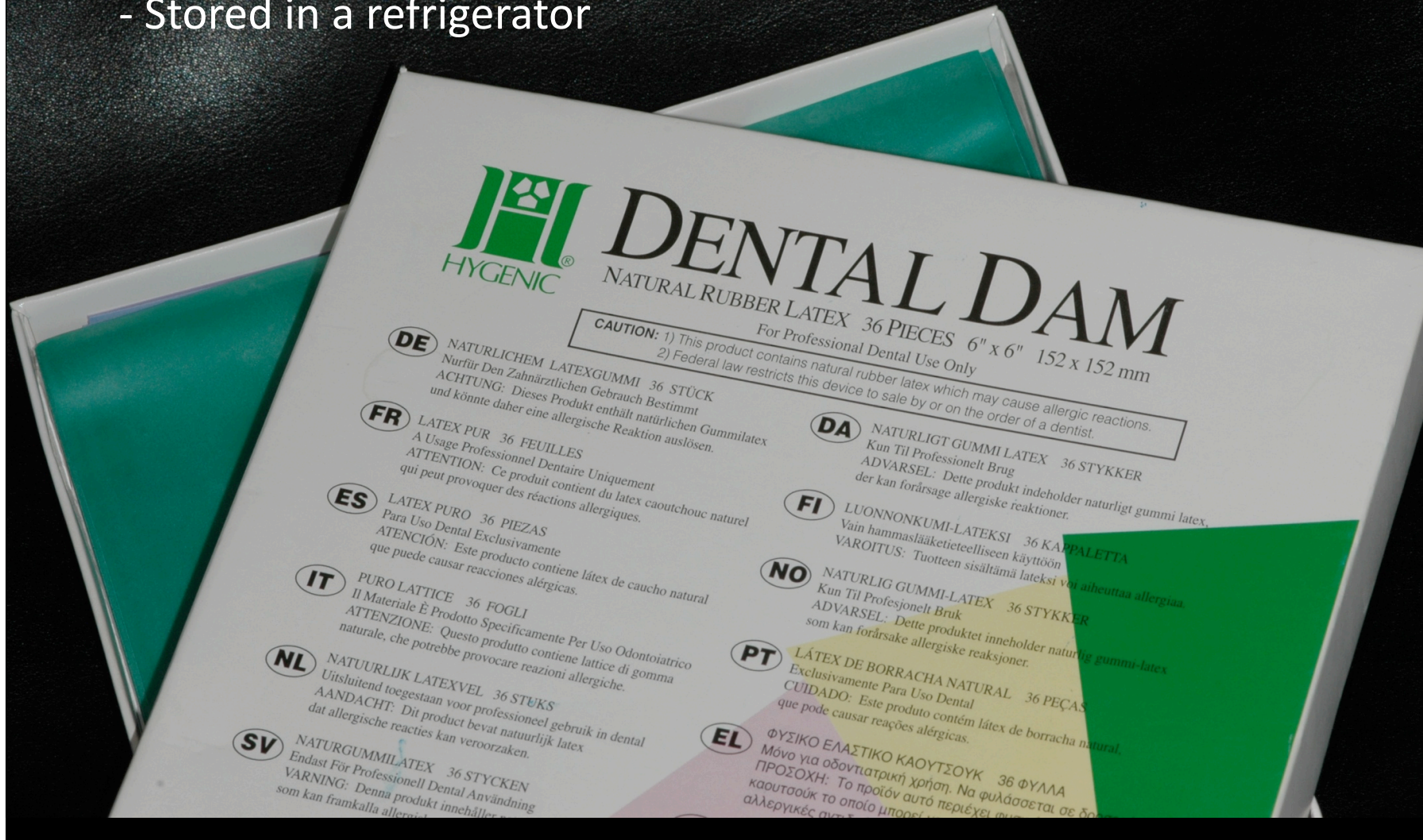
Rubber dam frame

Rubber dam sheet



Rubber dam sheet

- Made of either latex or latex-free material.
- Stored in a refrigerator





Rubber dam sheet

- Available in a wide range of colors from light to dark.
- Gray shade (better for matching shade)
- Available in scented and flavored.
- Size – 5 x 5" , 6 X 6"



Rubber dam sheet

- Places *dull surface* toward dentist

Rubber dam sheet

Gauge	Thickness
Thin	0.15 mm
Medium	0.20 mm
Heavy	0.25 mm
Extra heavy	0.30 mm
Special extra heavy	0.35 mm

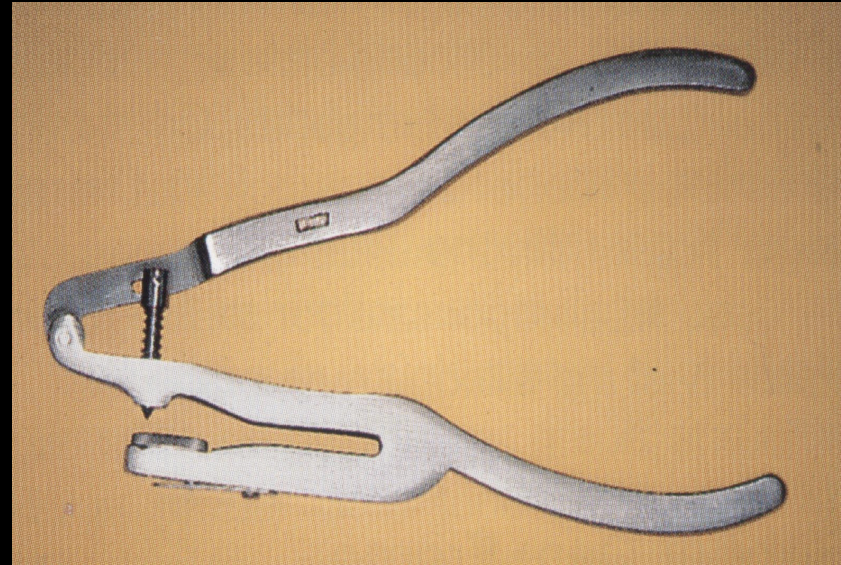
Uses gauge heavy or extra heavy for operative dentistry

- Better seal
- More effectively retract tissues
- less likely to tear
- less difficulty to apply

Rubber dam punch



Ainsworth

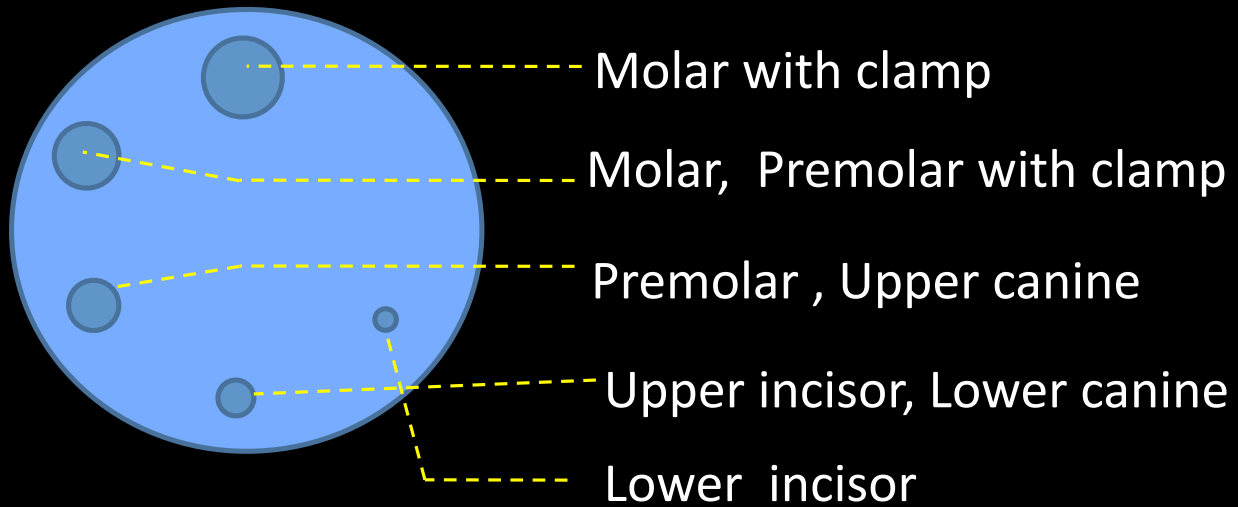


Ivory

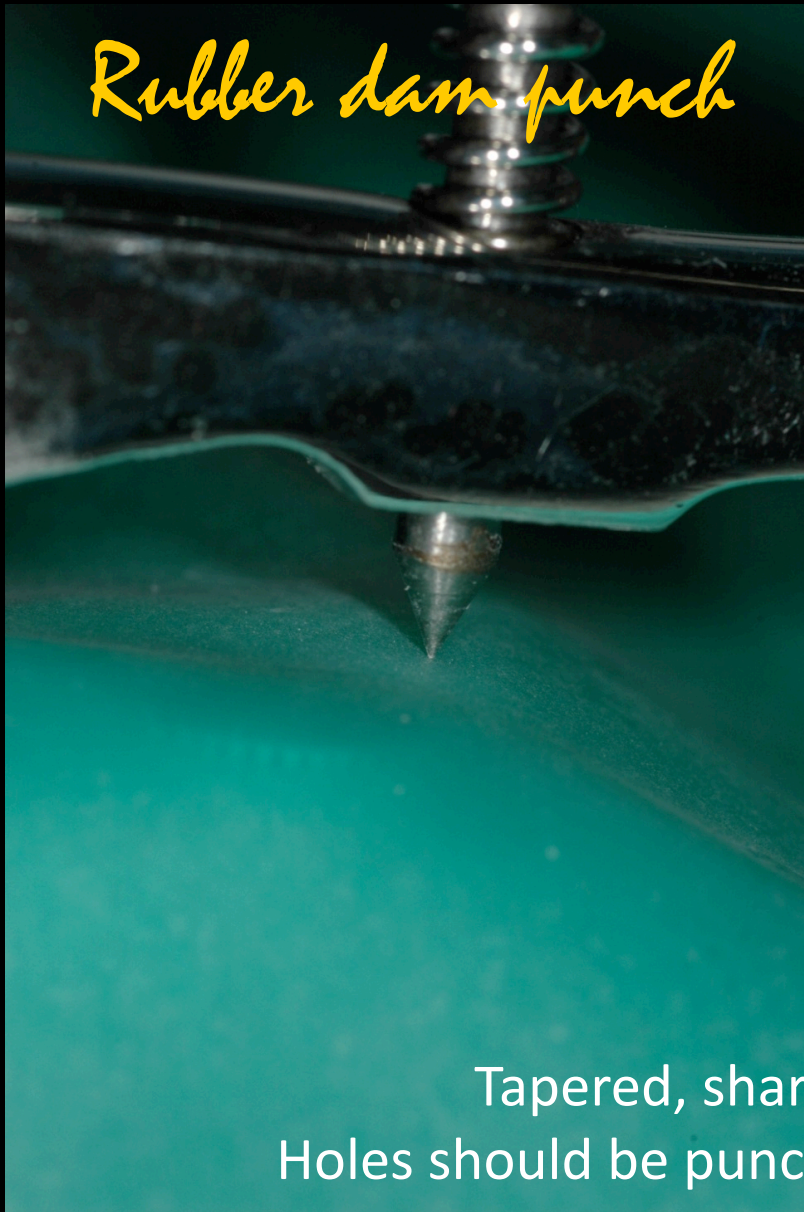
Rubber dam punch

Rotating metal table with 5-6 holes of varying sizes

Rubber dam punch

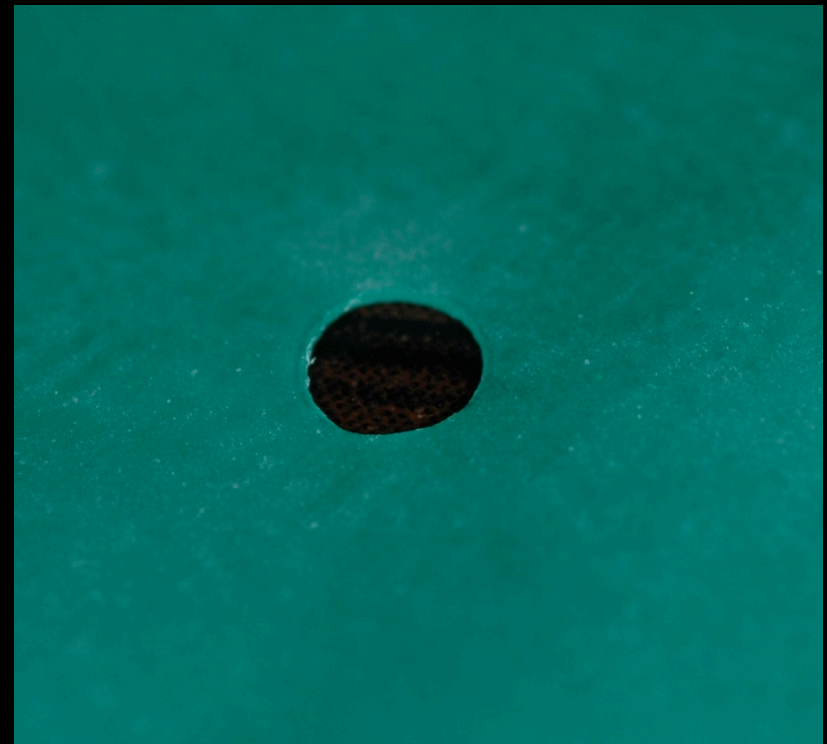


Rubber dam punch

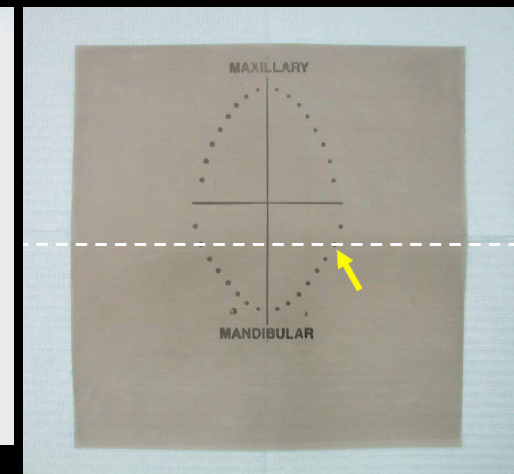
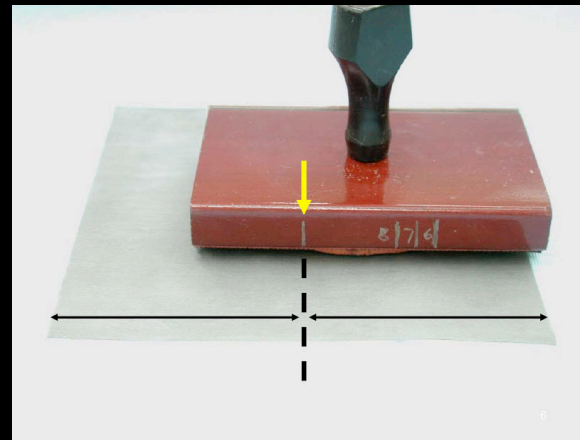
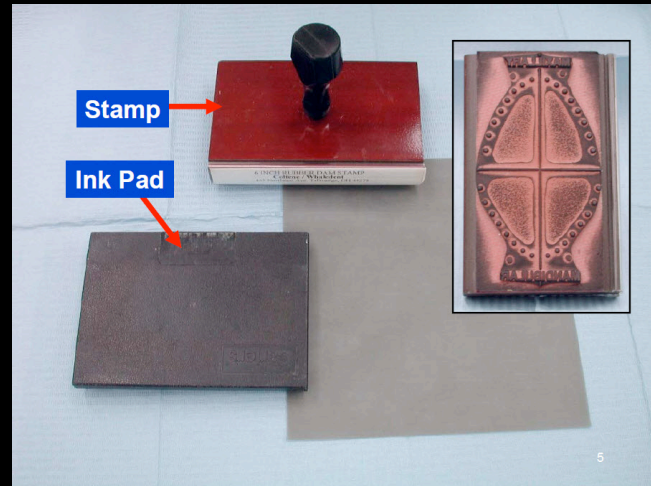


Tapered, sharp-pointed plunge
Holes should be punched by following the arch

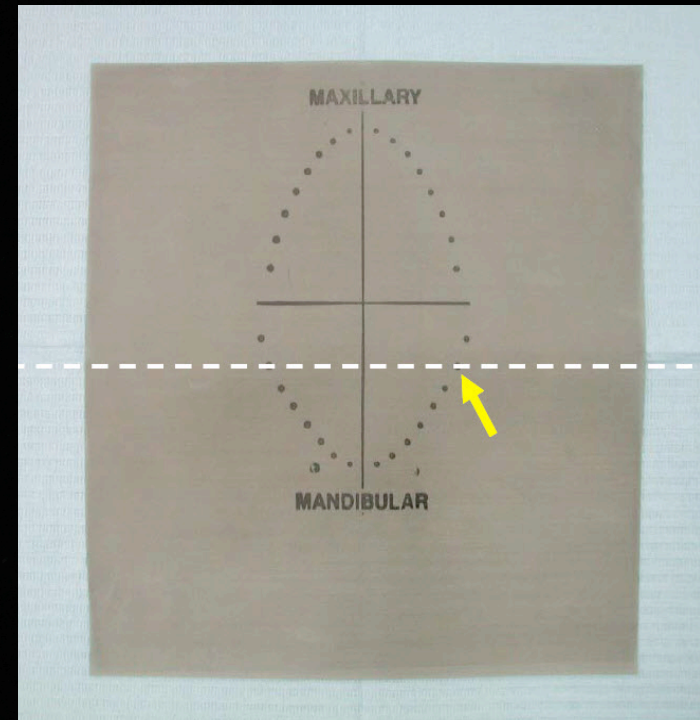
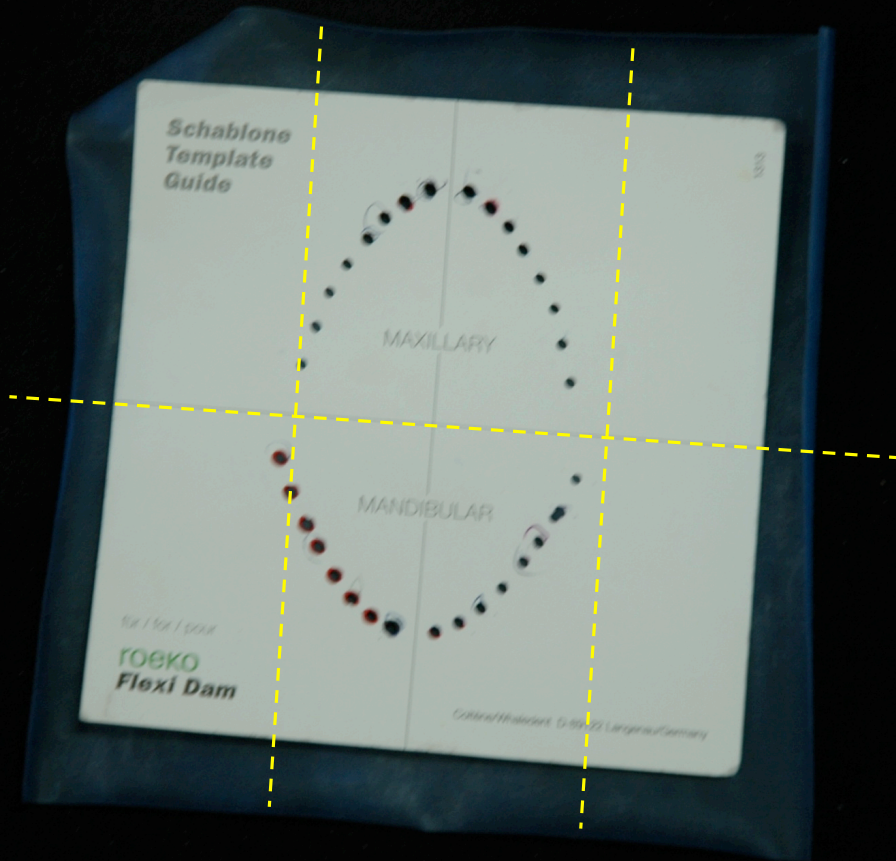
Rubber dam punch



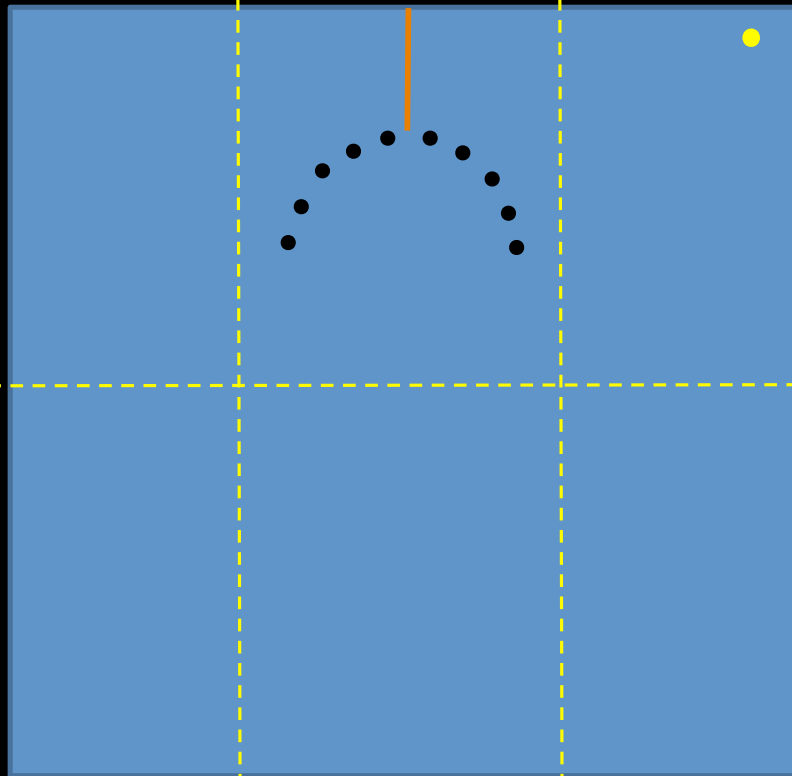
Dental dam stamp : Ink pad and stamp used to mark the dental dam with predetermined markings for average adult and pediatric arches.



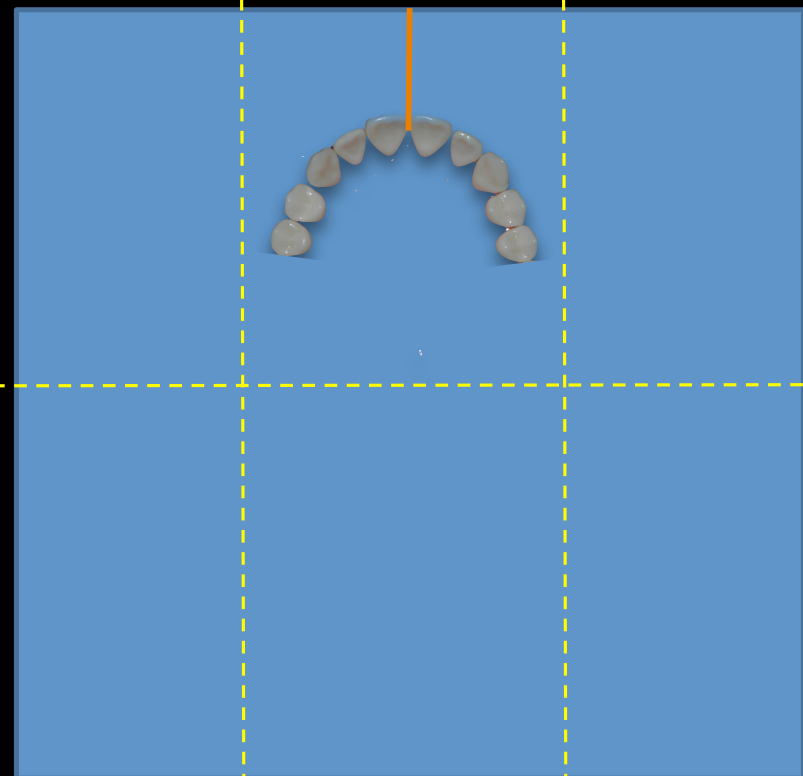
Dental template : Stiff plastic template with holes indicating where the teeth should be marked.



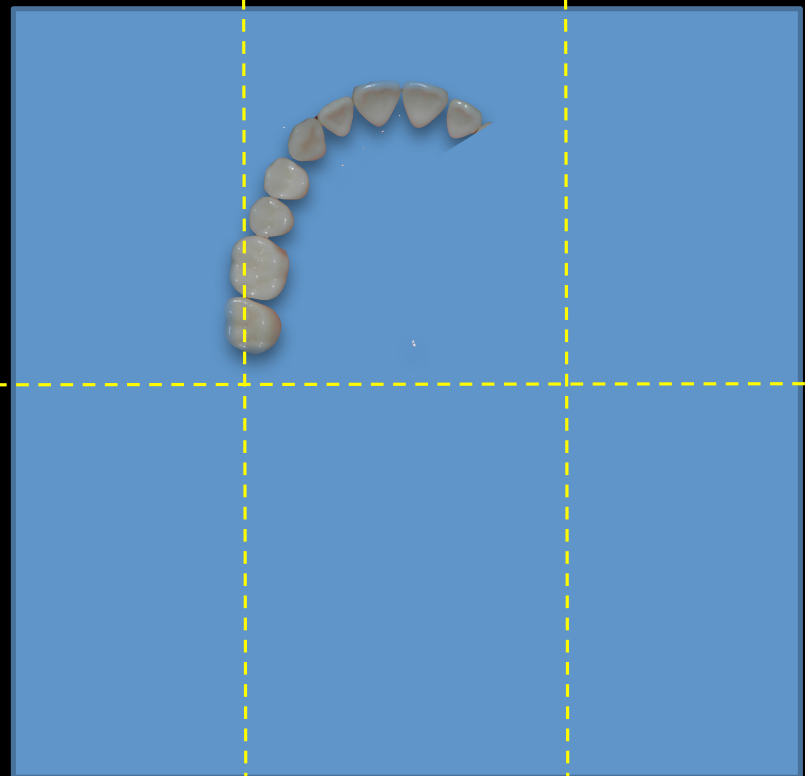
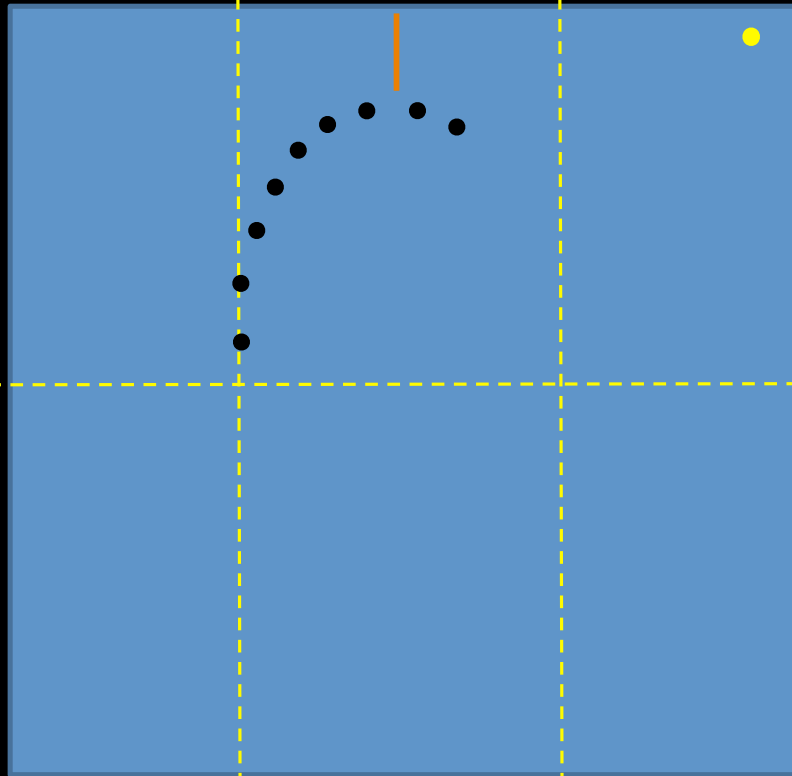
1 inch (2.5cm)

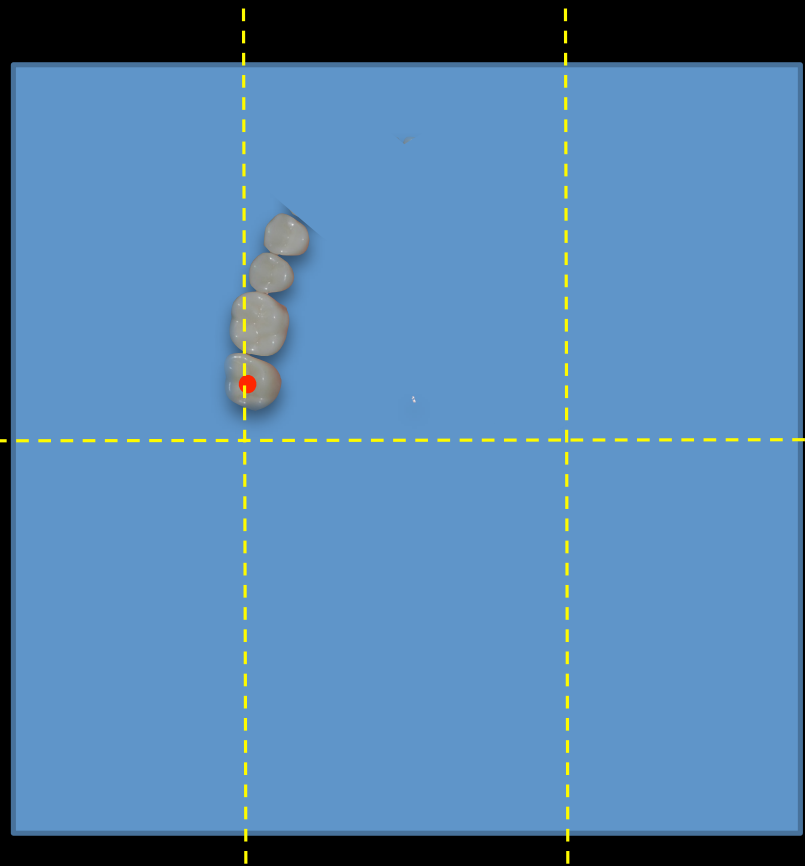
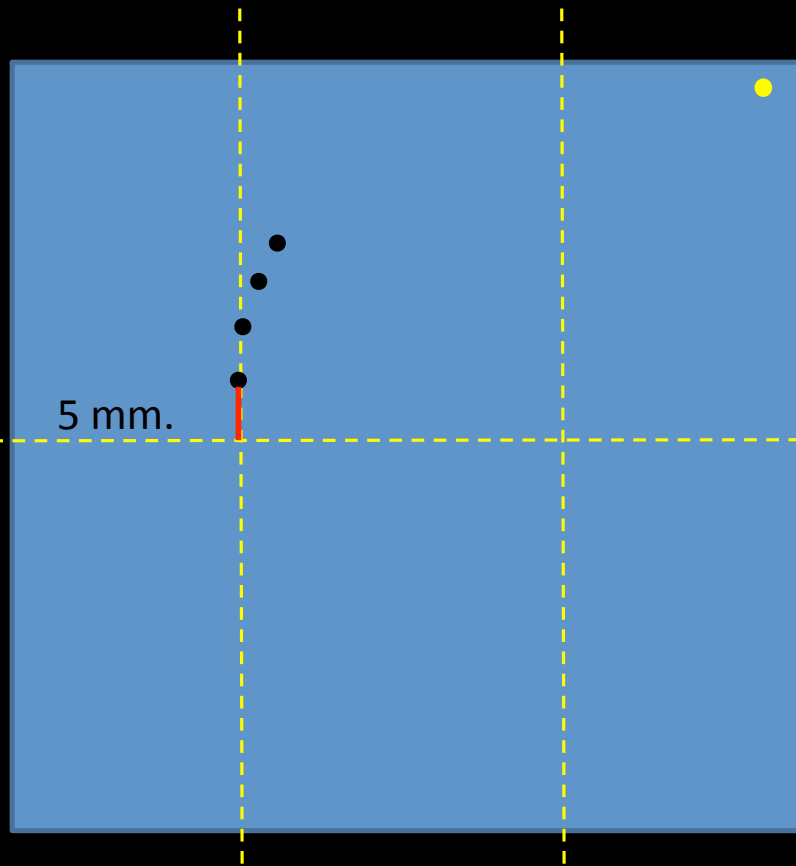


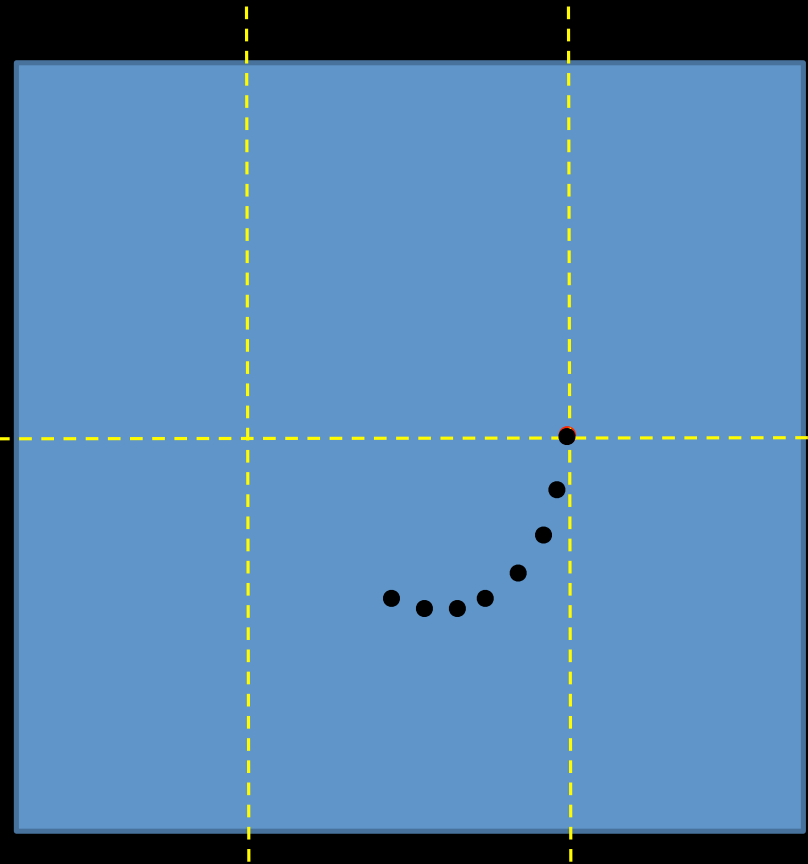
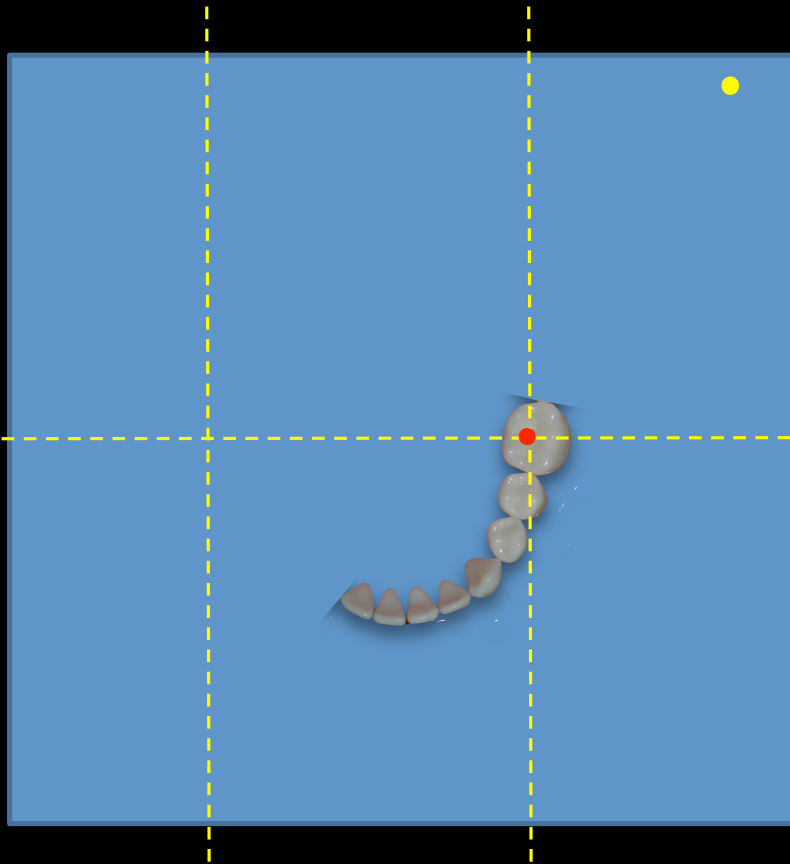
1 inch (2.5cm)

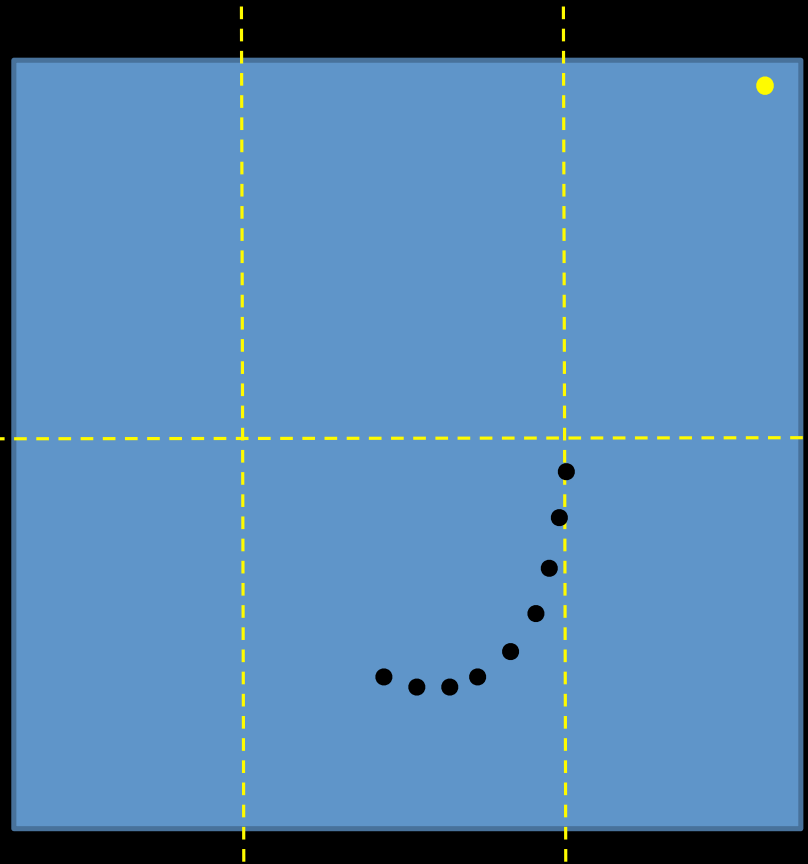
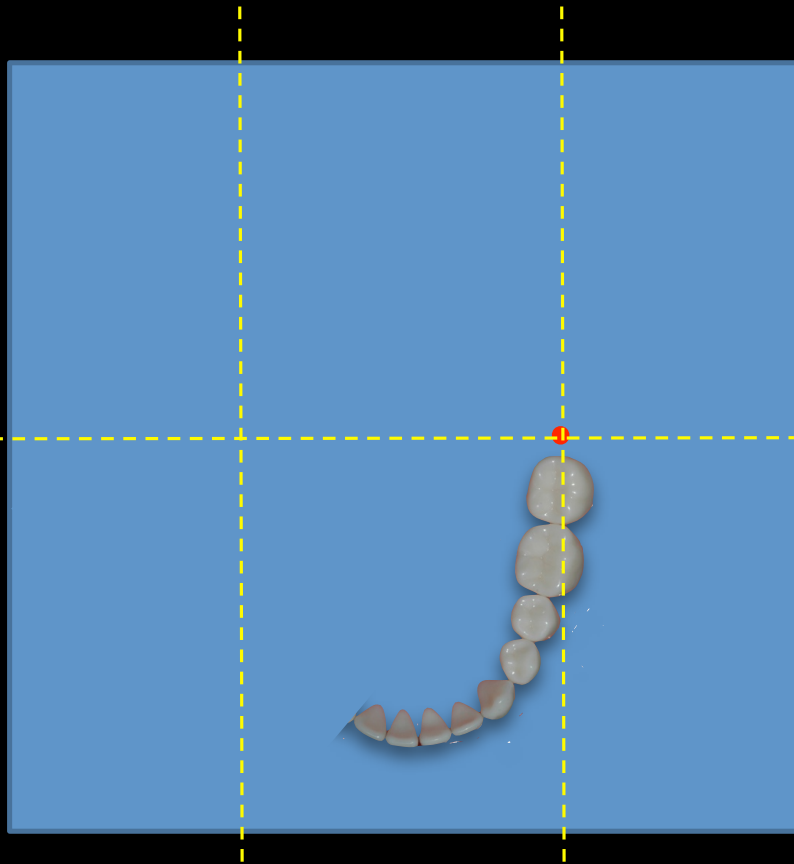


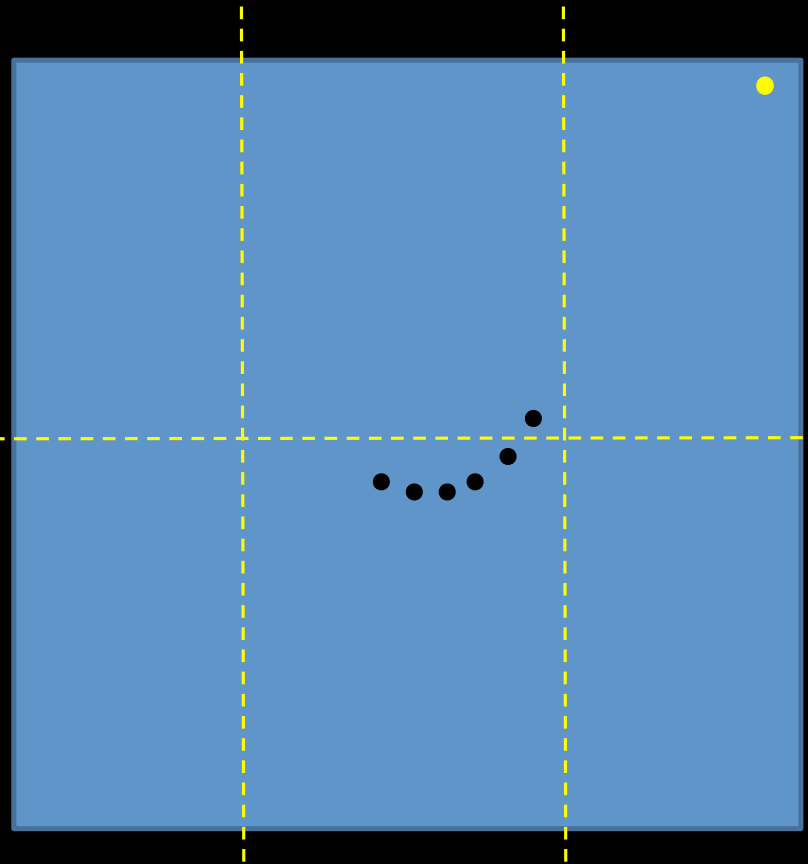
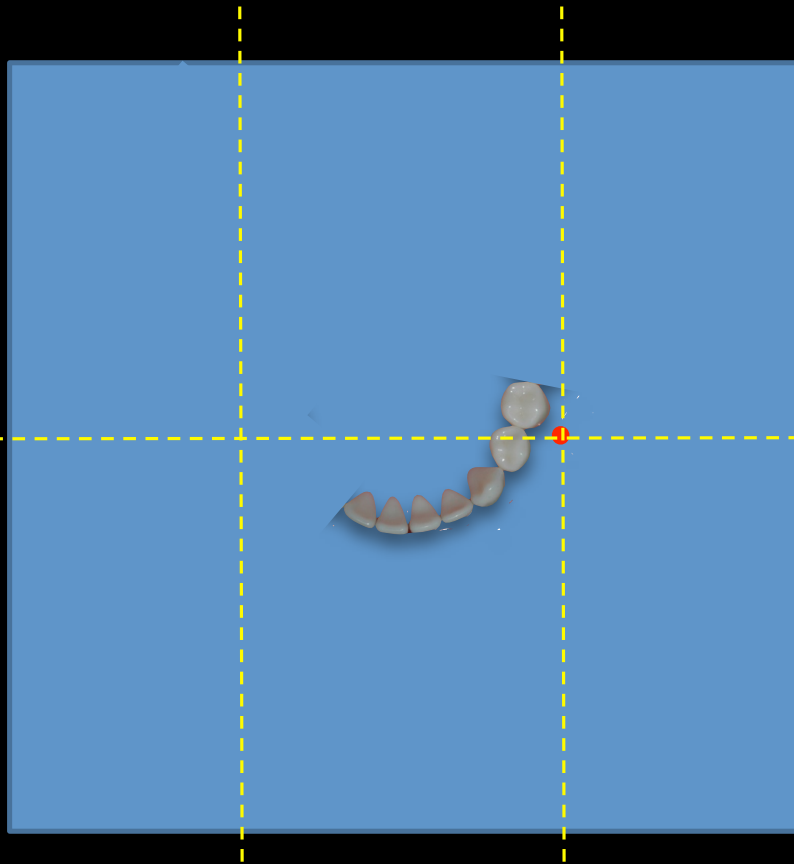
1 inch (2.5cm)





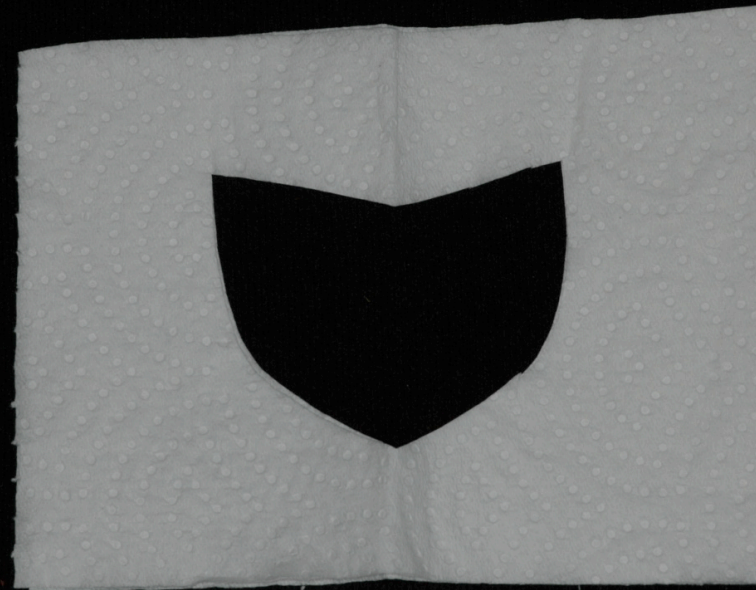






Rubber dam Napkin

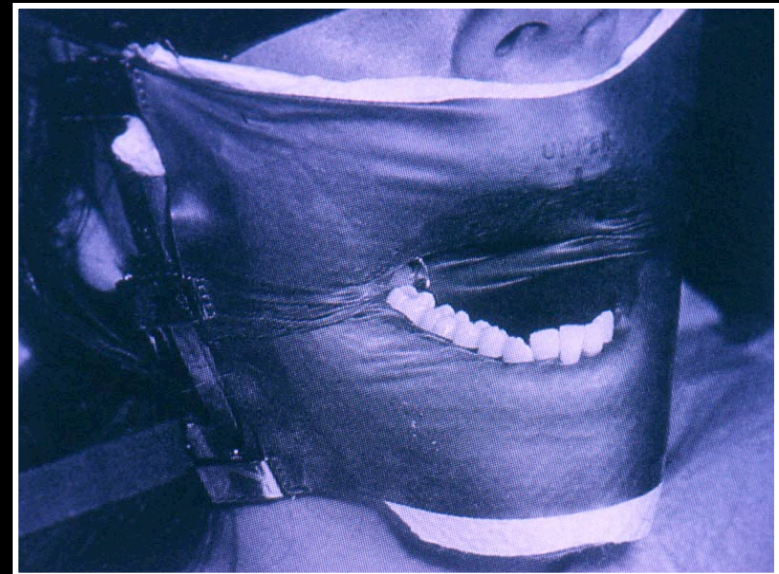
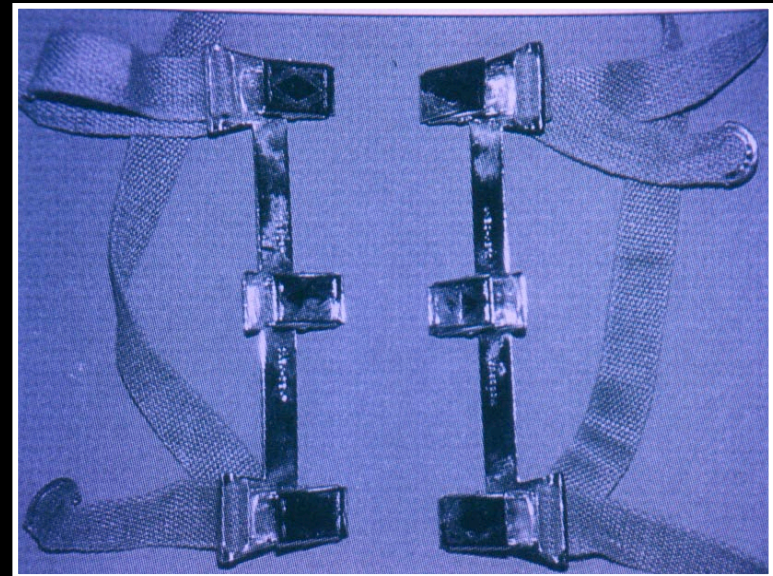
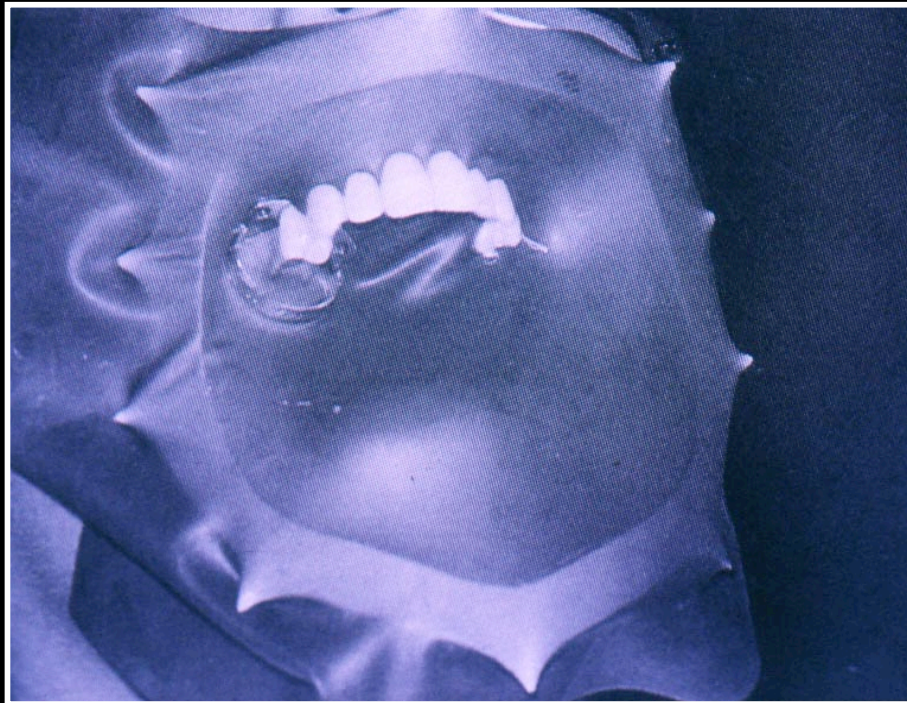
Increases patient comfort by absorbing moisture between the patient's face and the dam.



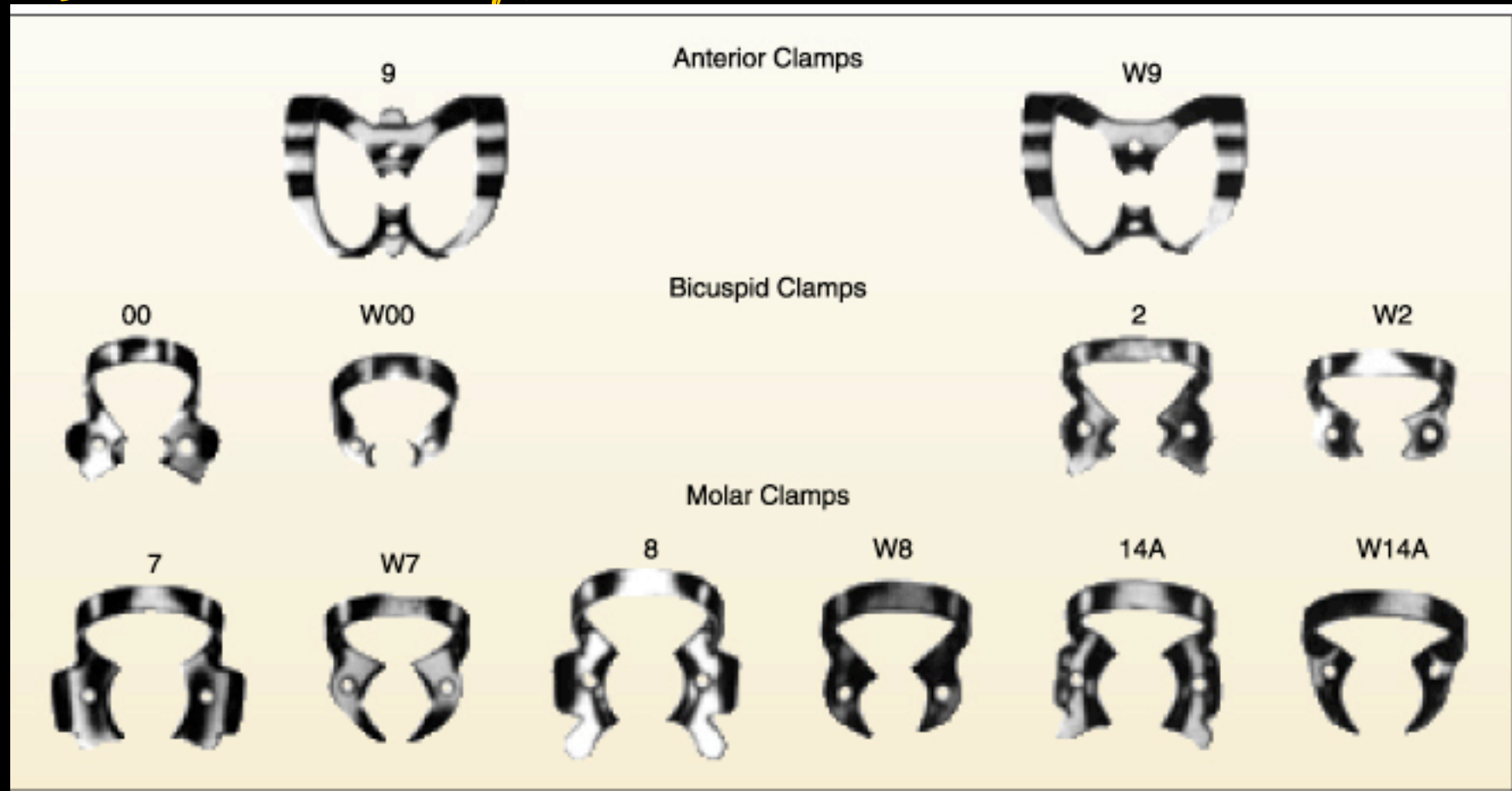
Rubber Dam Frame

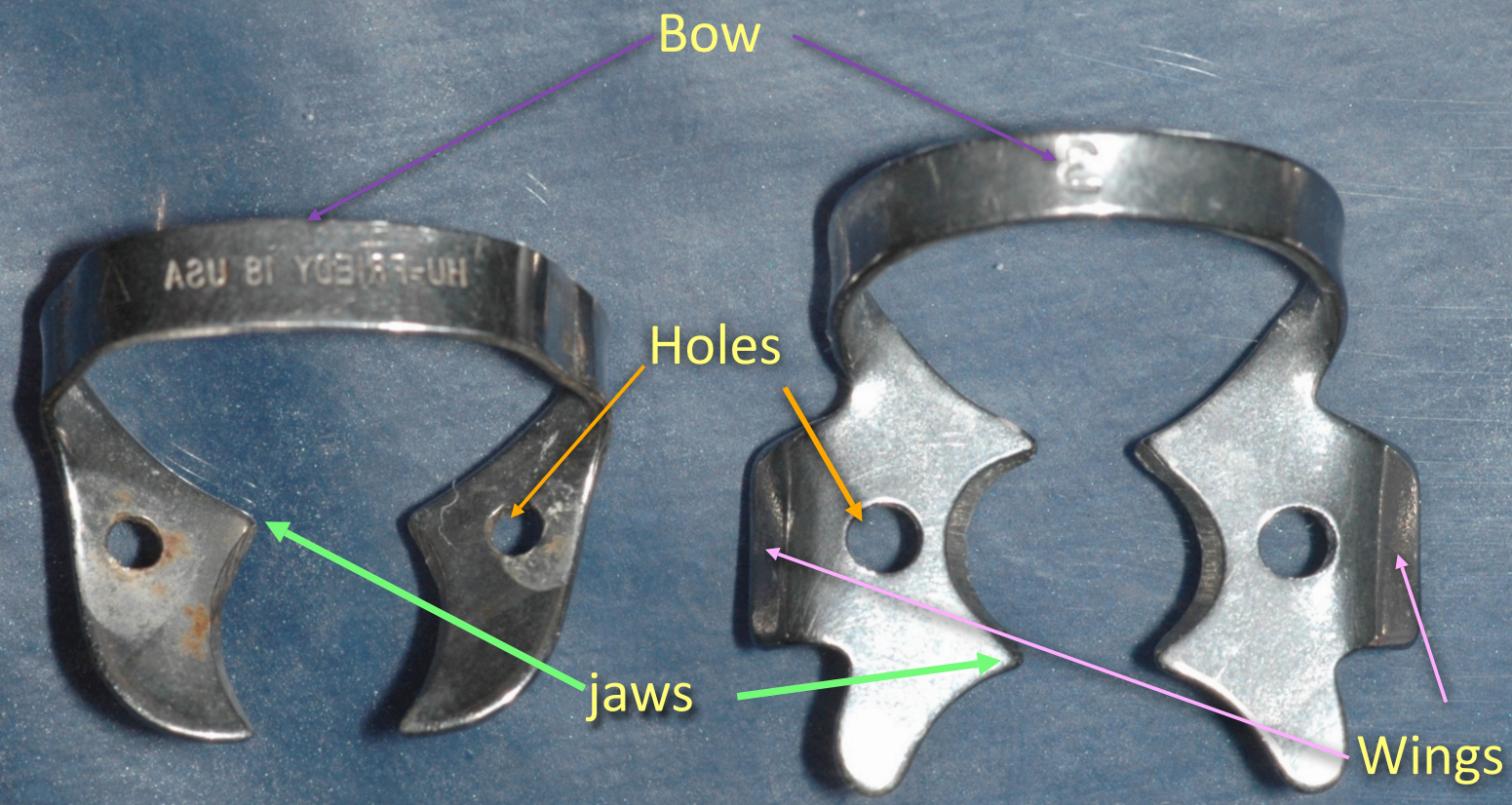
- Stabilizes and stretches the dam so it fits tightly around the teeth and out of the operator's way.
 - Available in plastic and metal frames.
 - U-shaped frame.





Dental dam clamps.



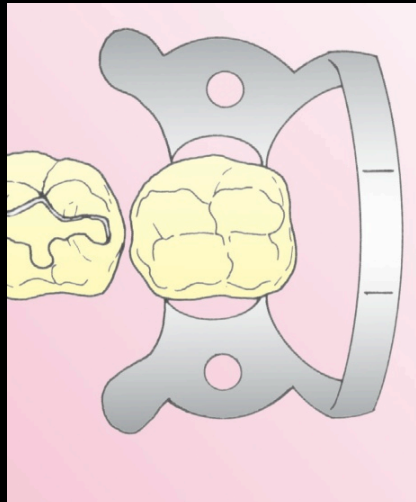


Wingless type (W)

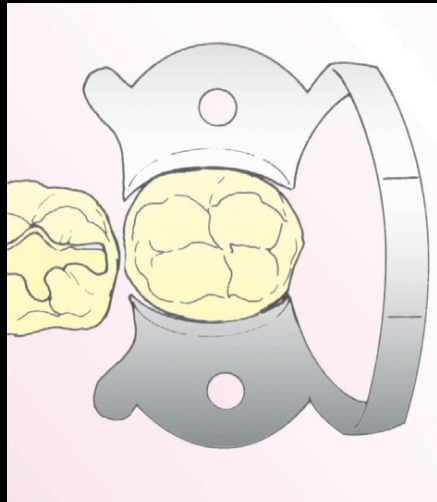
Wing type

Fitting the clamp

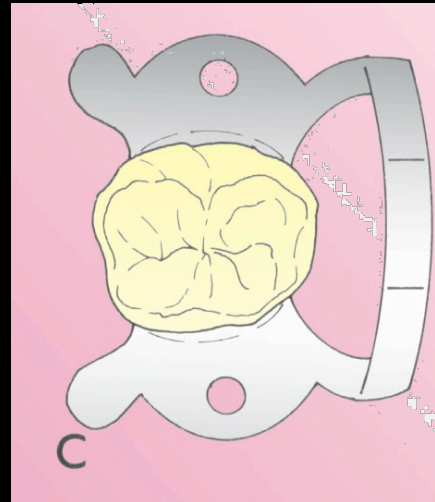
A



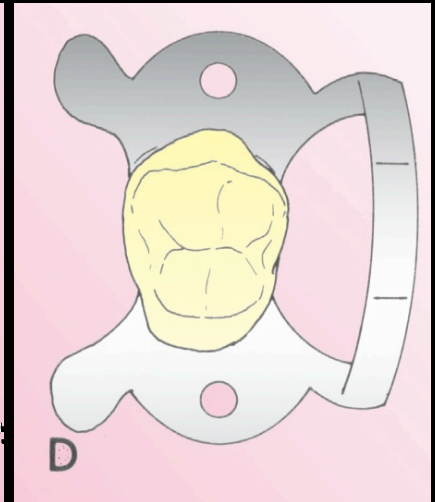
B



C



D





Passive type
(Horizontal plane)



Active type

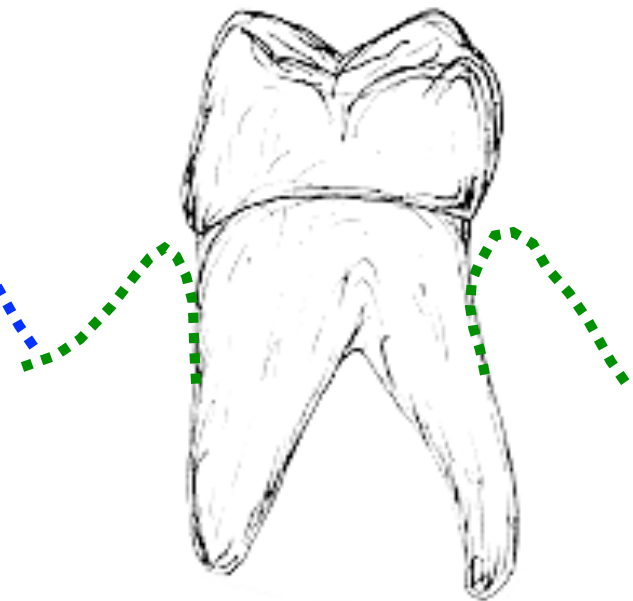
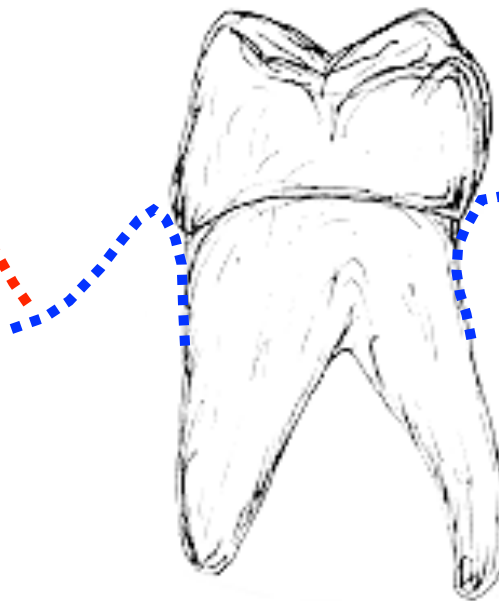
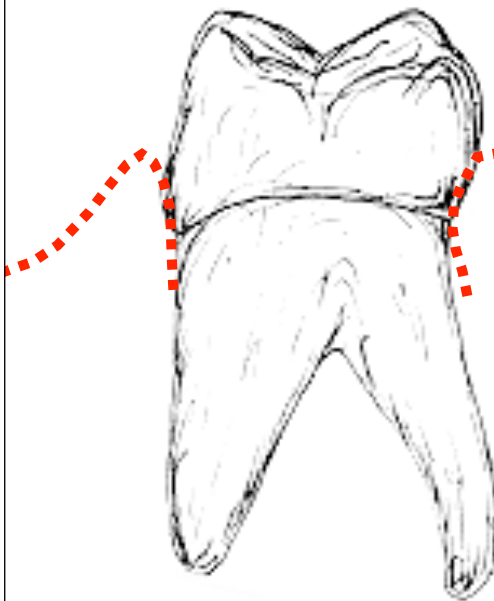


Passive type
(Horizontal plane)



Active type

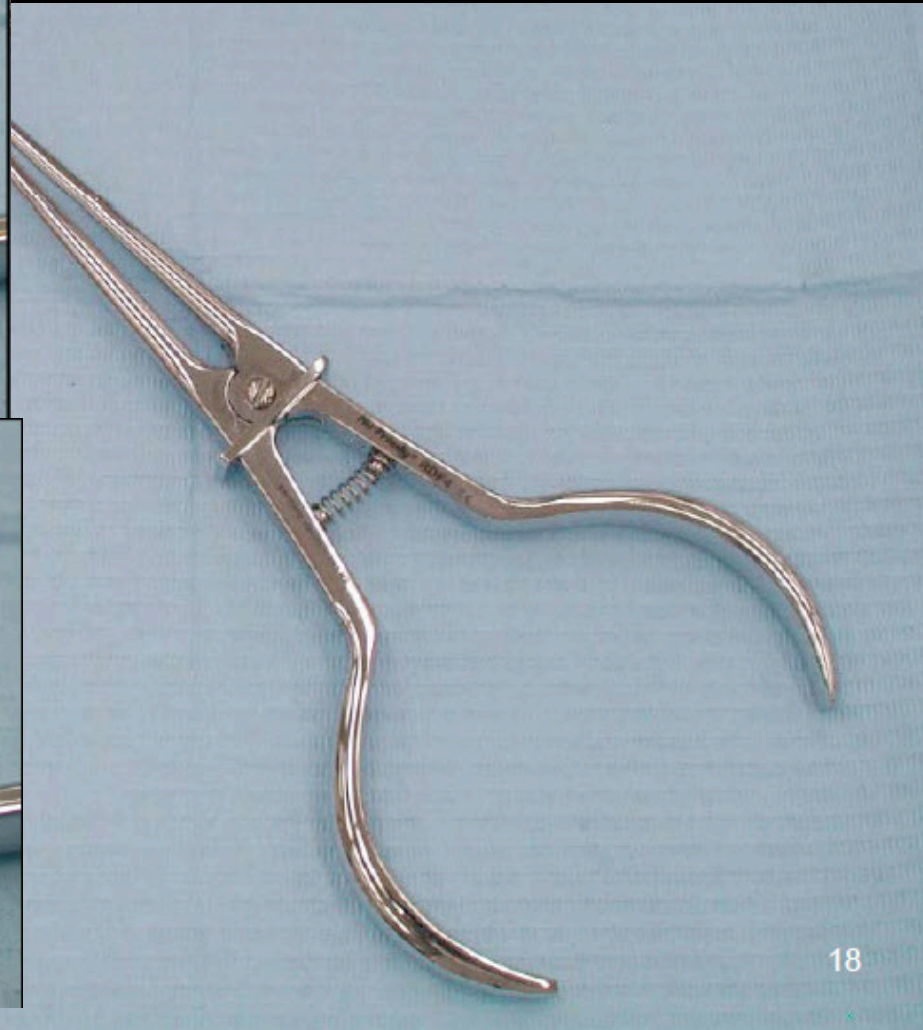
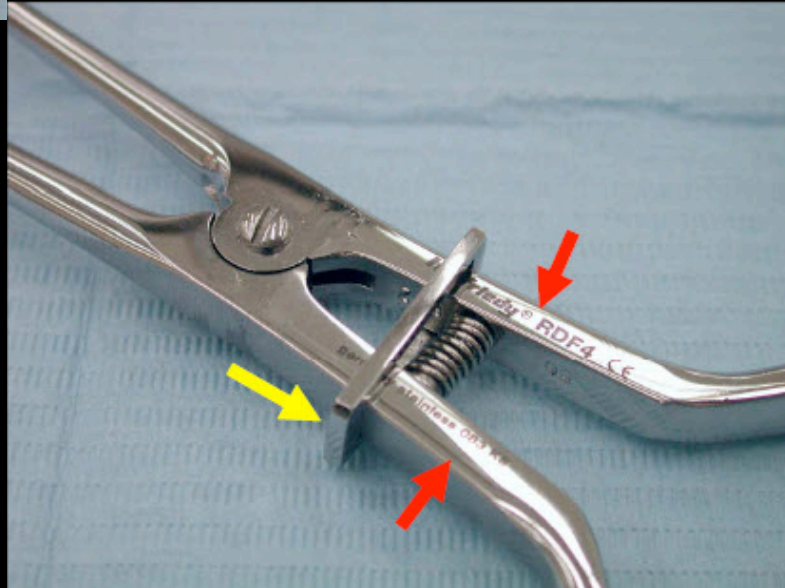
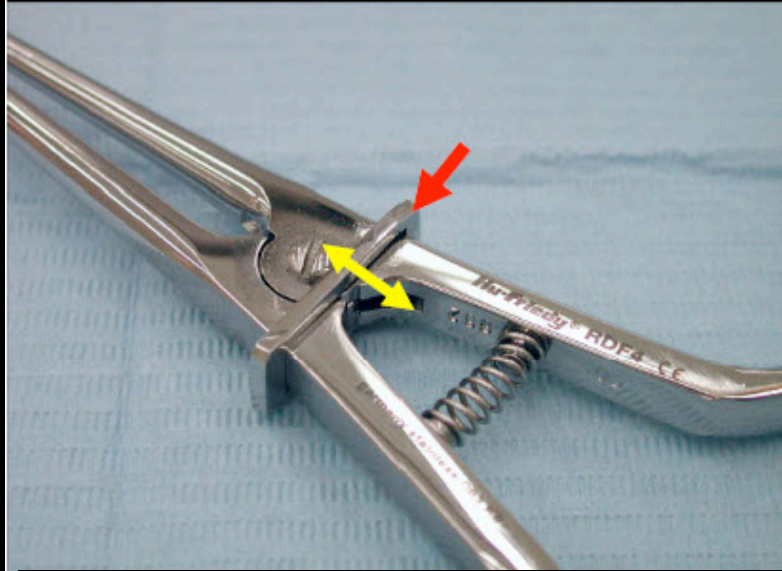




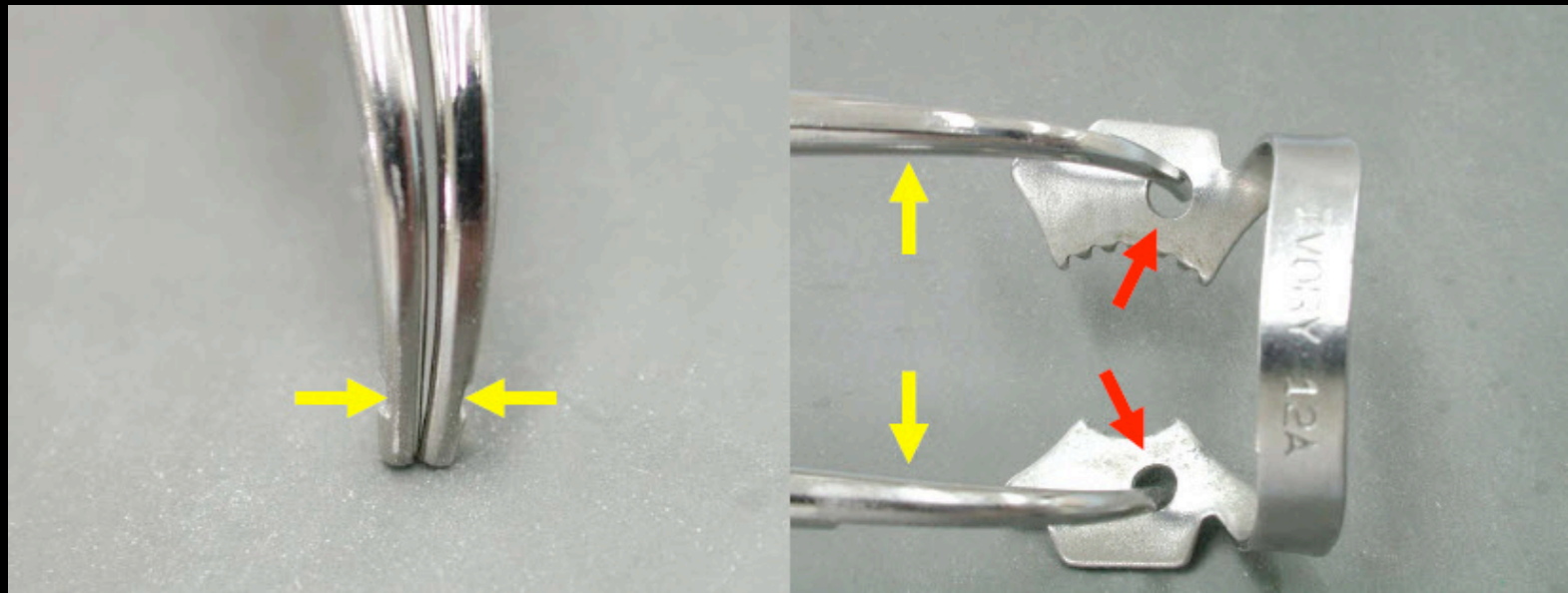
Soft clamp



Rubber Dam Retainer Forceps



Rubber Dam Retainer Forceps



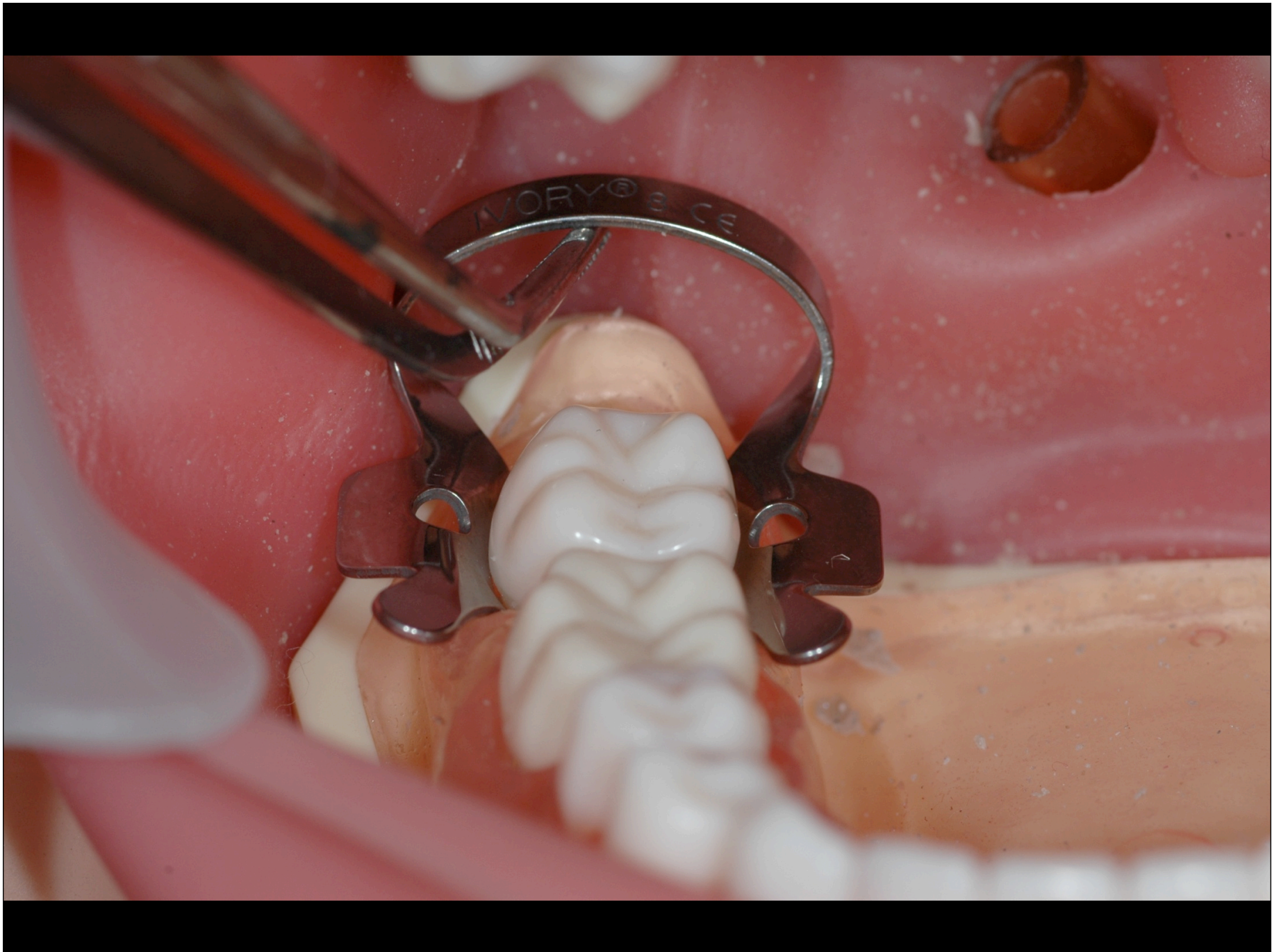
Rubber dam Application

Steps by Step

Fitting the clamp : Designed to fit on the cervical area of the tooth below the height of contour and at, or slightly below, the cementoenamel junction.





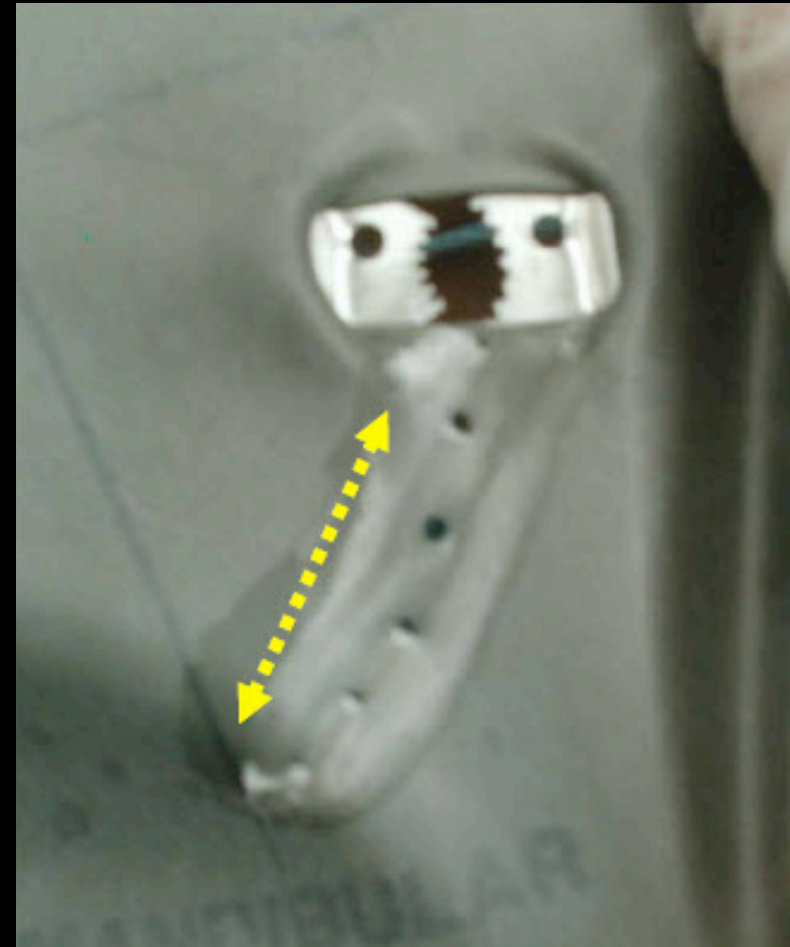


Ligature: An important safety step that makes it possible to retrieve a clamp should it accidentally become dislodged and then inhaled or swallowed by the patient.



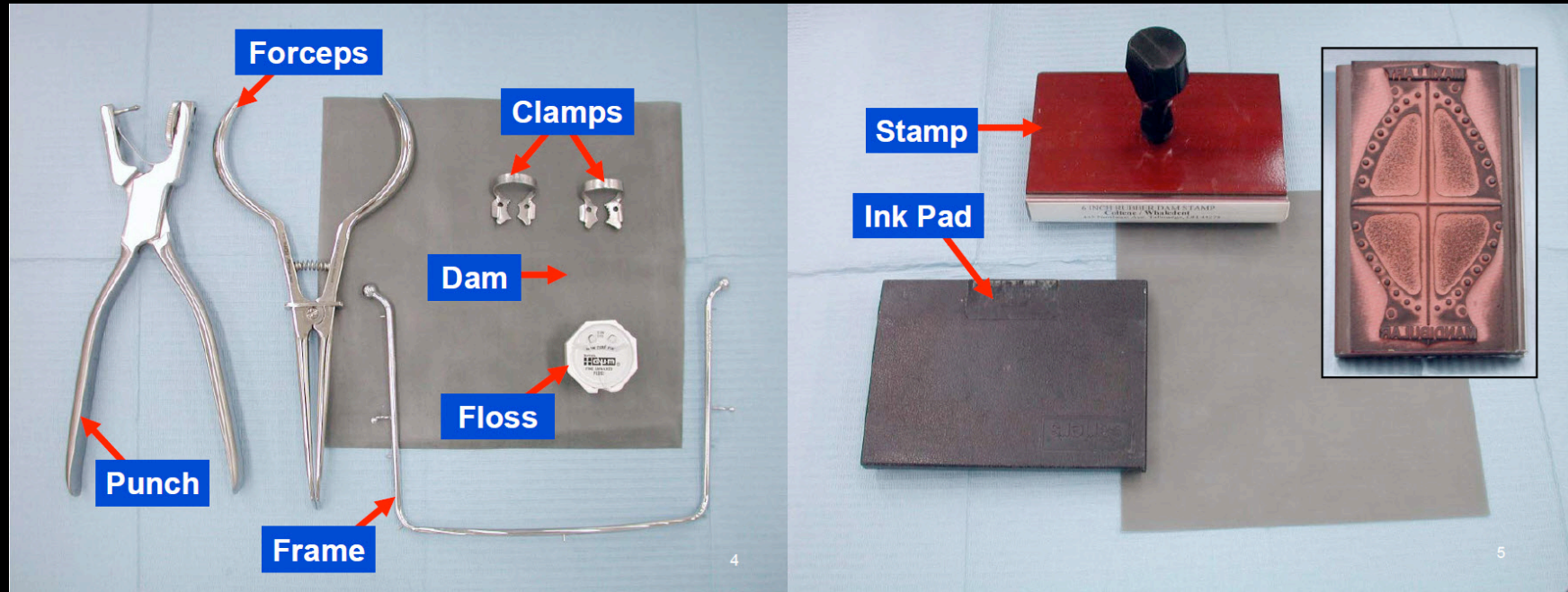
Lubricant

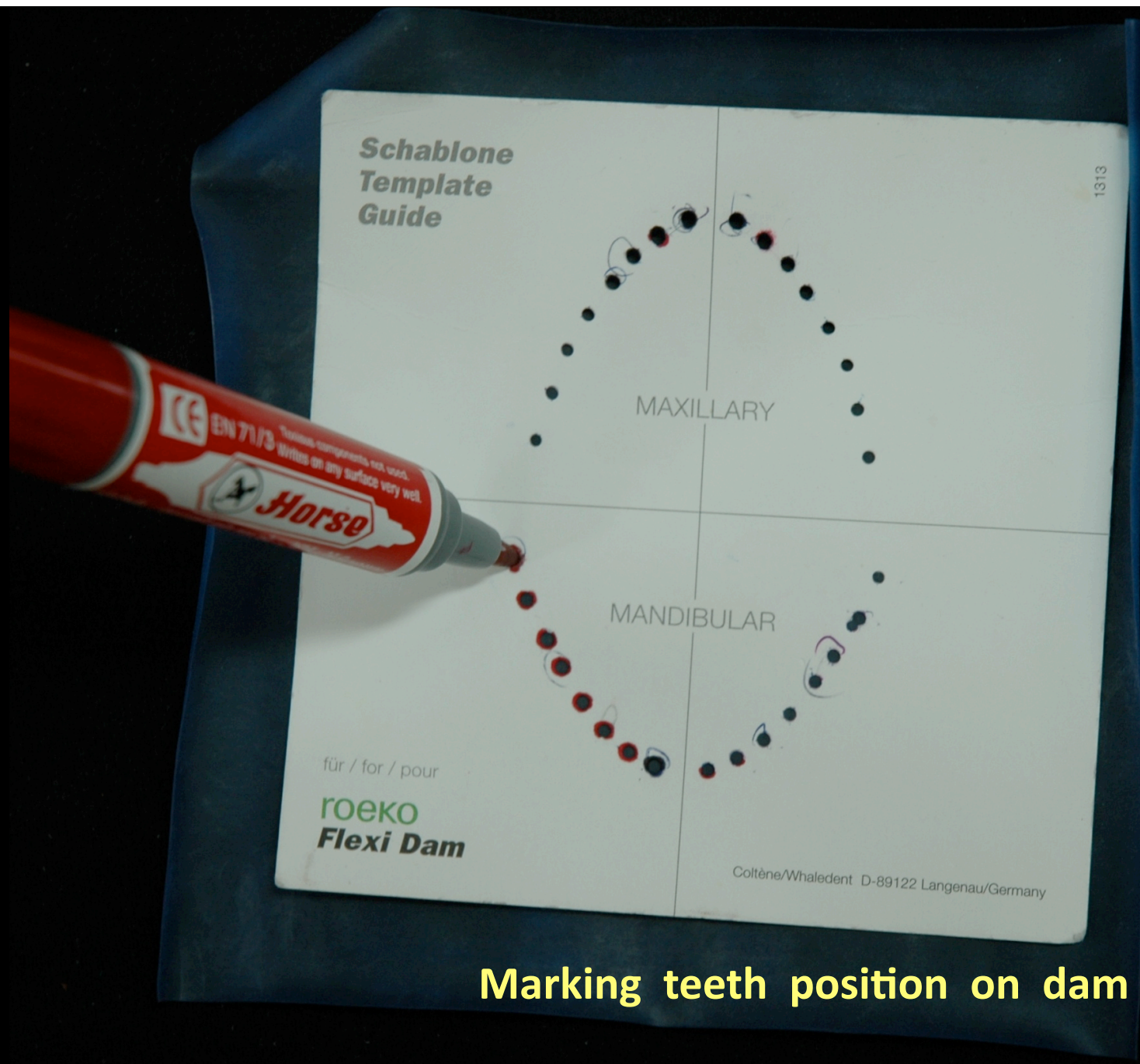
Water-soluble lubricant placed on the underside of the dam to help the dam material slide over the teeth and through the interproximal spaces.



Steps in preparation and placement

- Dental dam equipment and supplies readied
- Check contact area with dental floss





Marking teeth position on dam



Rubber dam is punched.



Clamp selected, ligated.

Technique

- Winged clamp in dam method of dam application
- Wingless clamp in dam method of dam application
- Dam over clamp method of dam application
- Don't use clamp method of dam application



Winged clamp in dam method of dam application



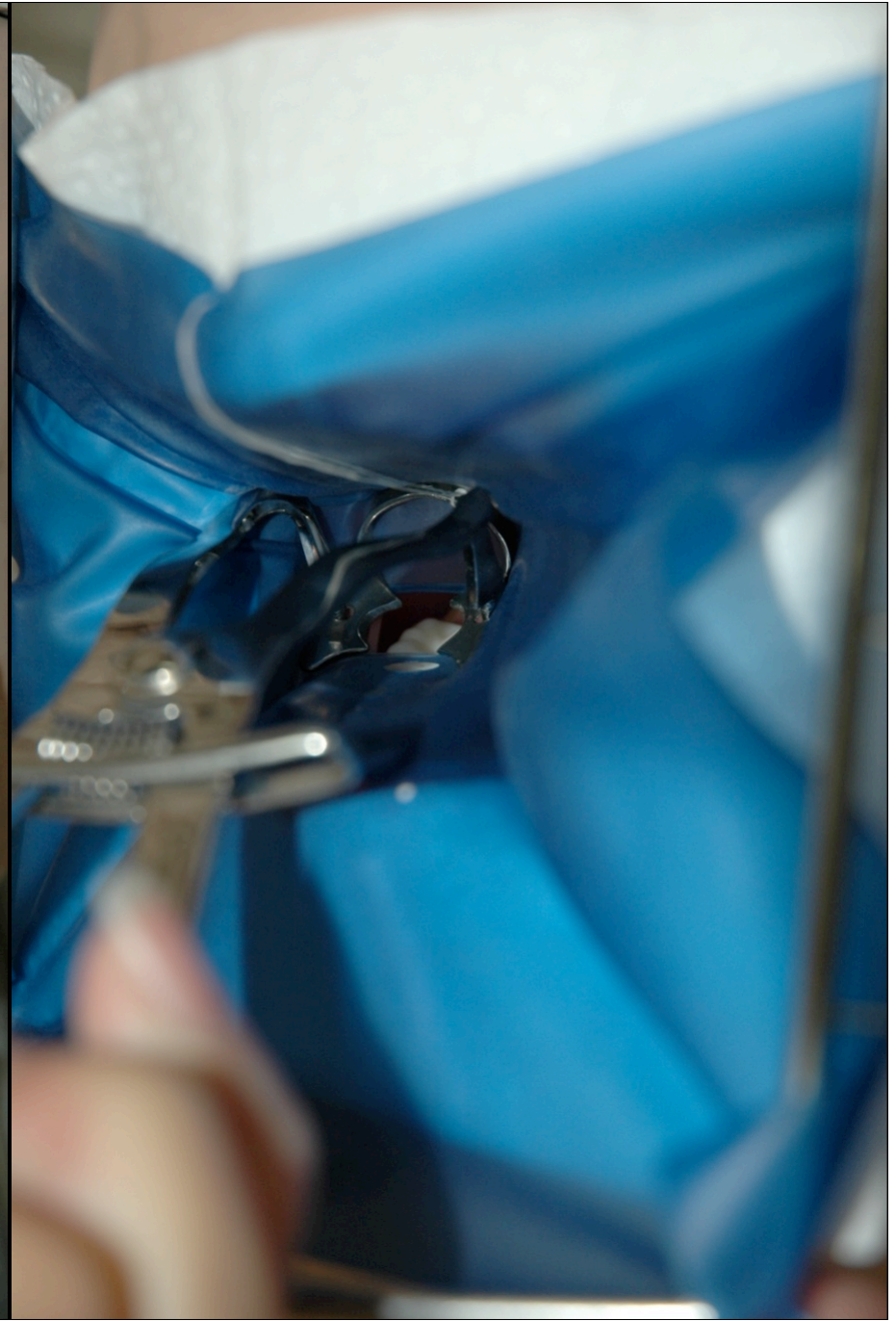


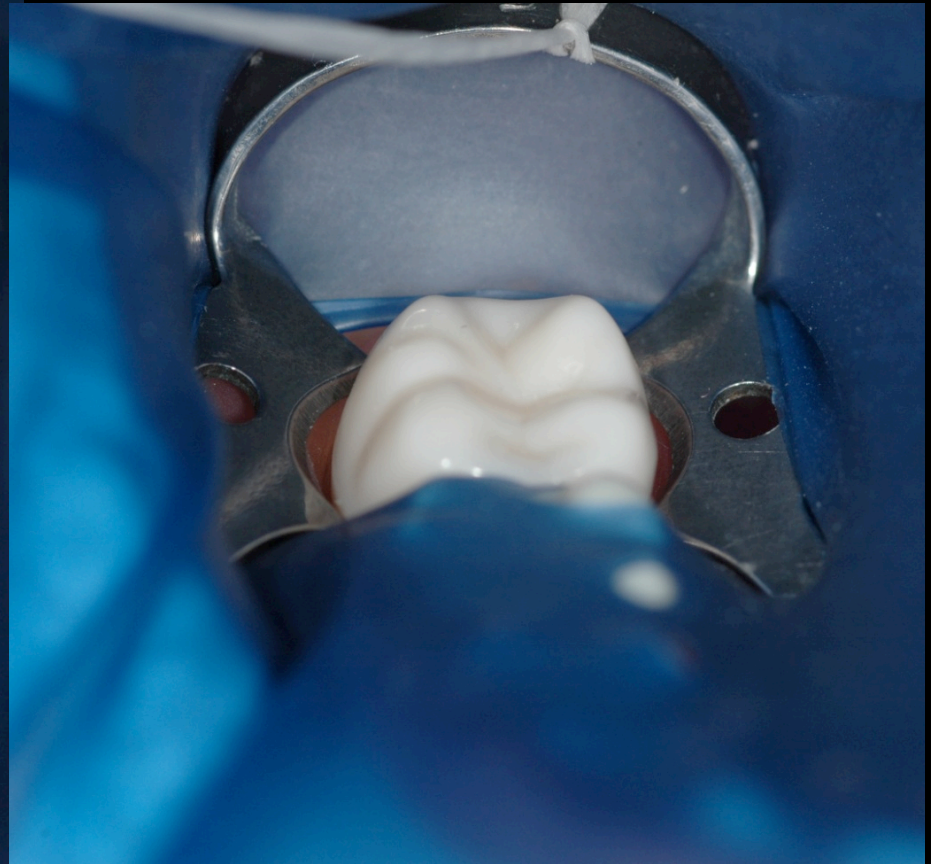
Water-soluble lubricant placed on the underside of the dam

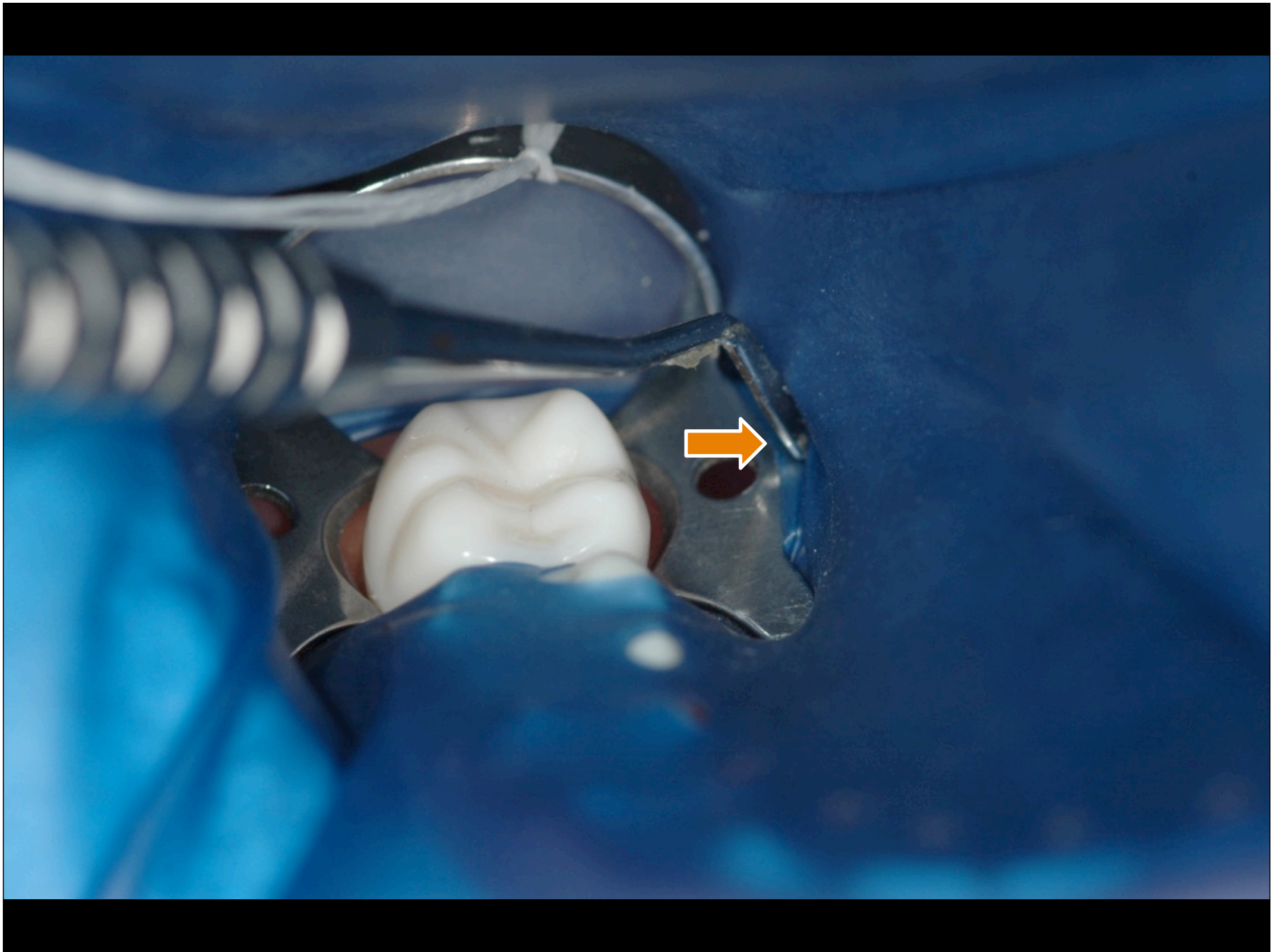


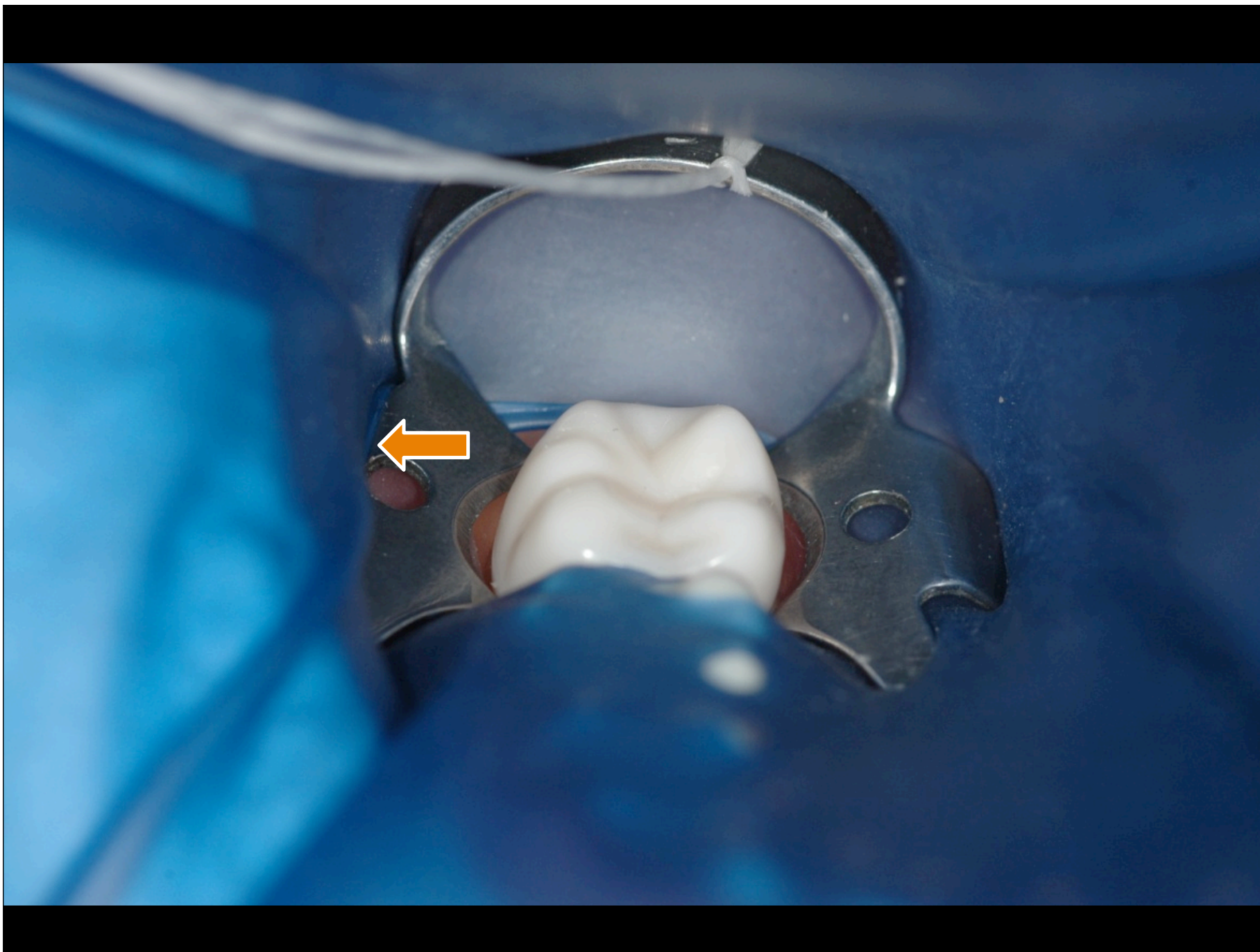


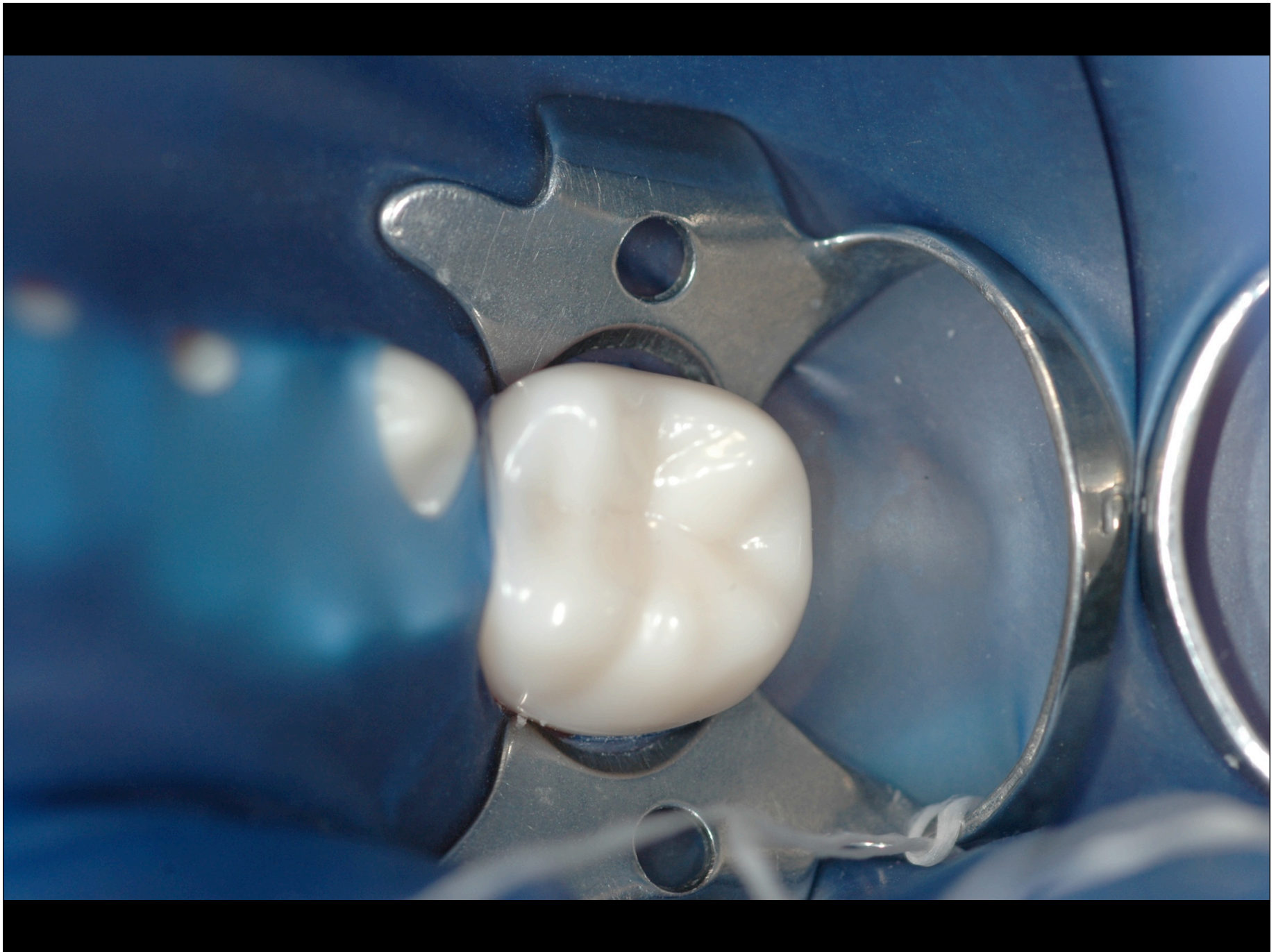






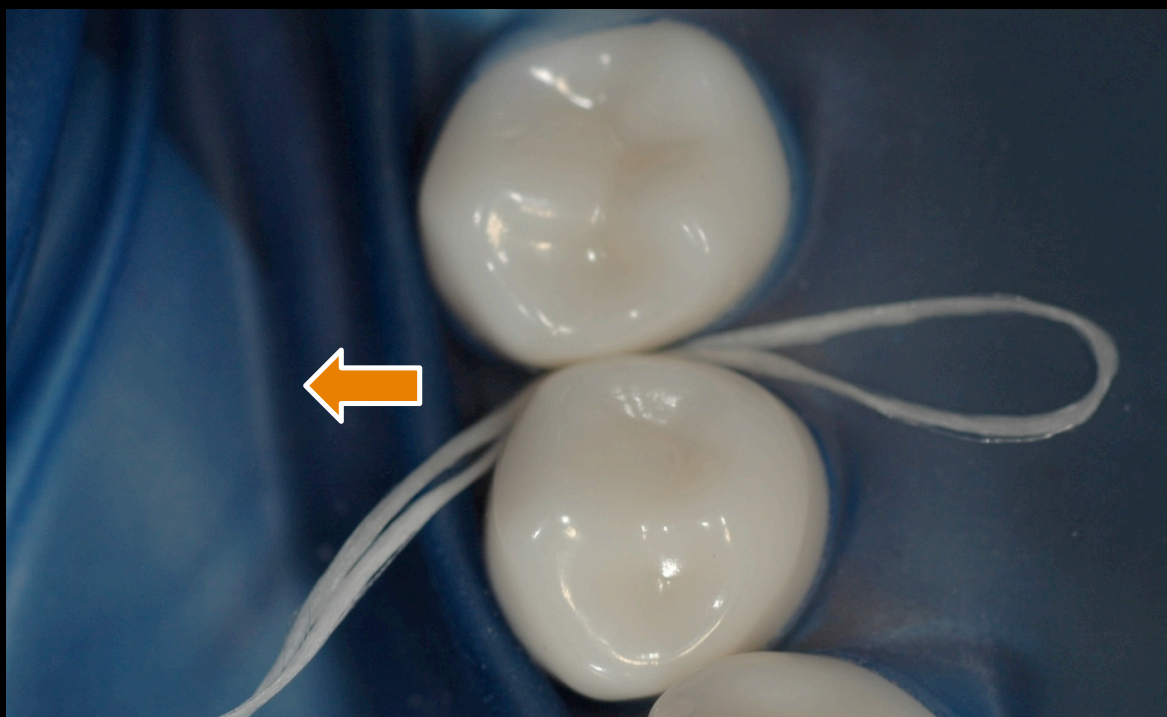












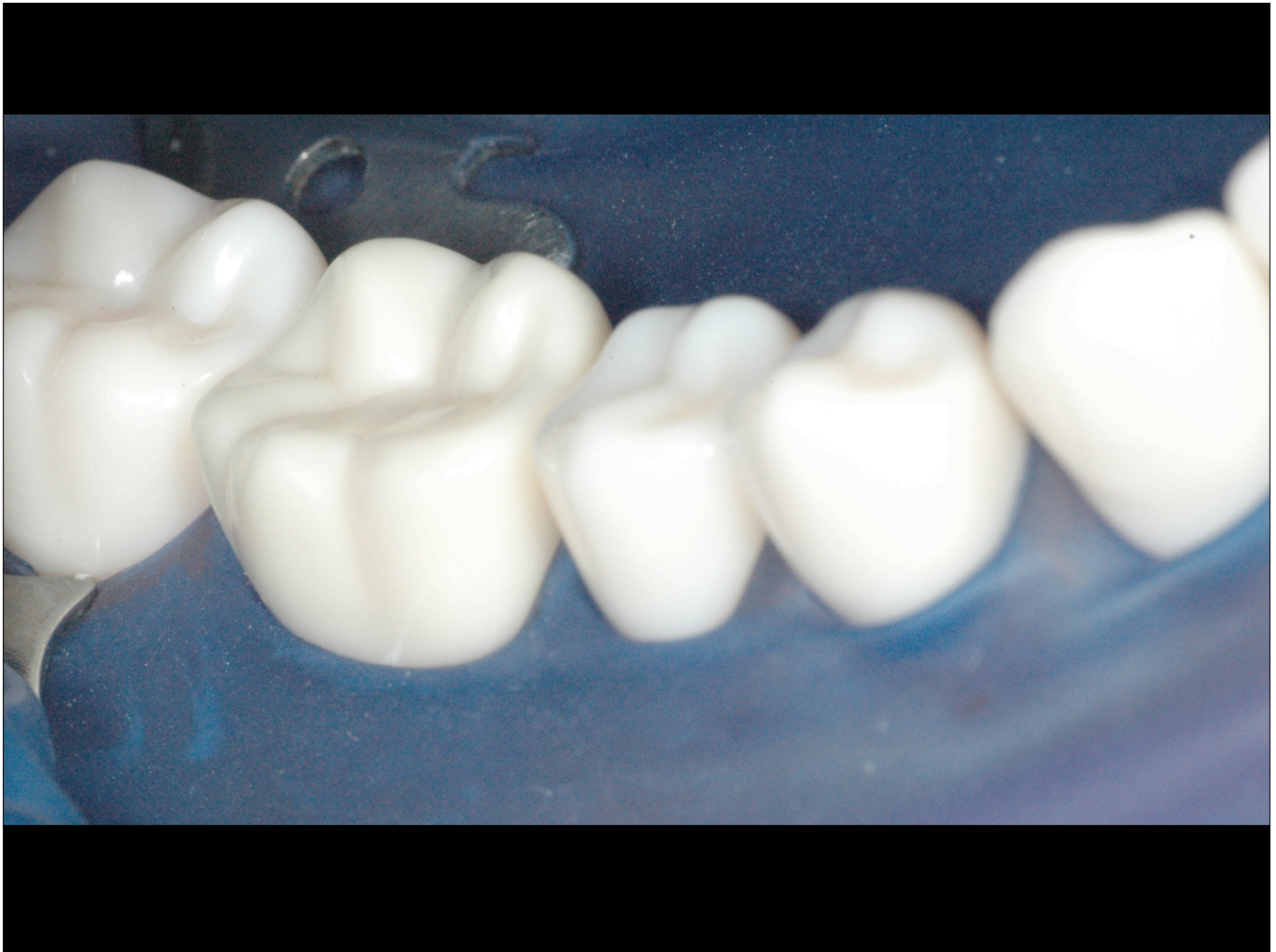


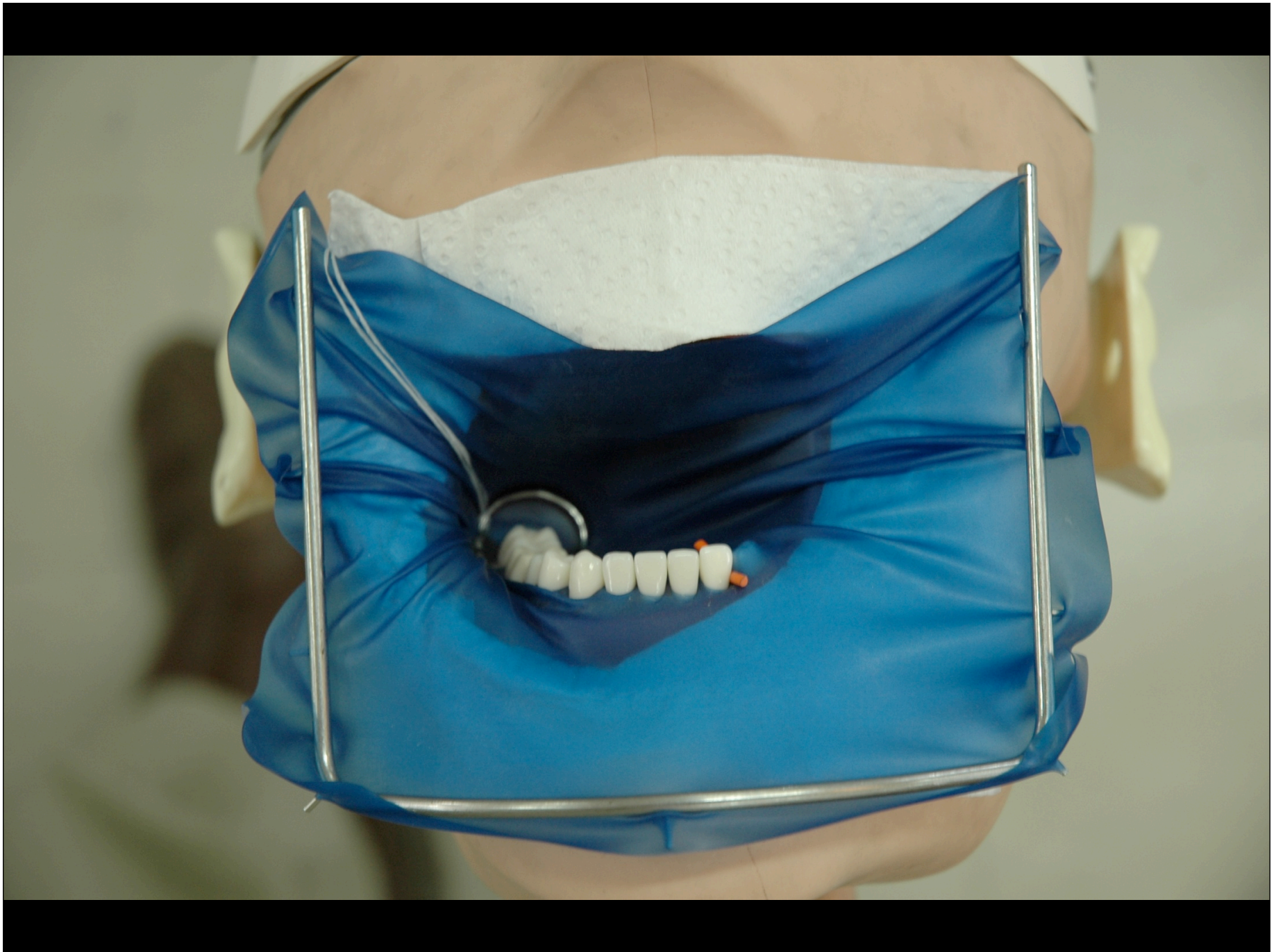


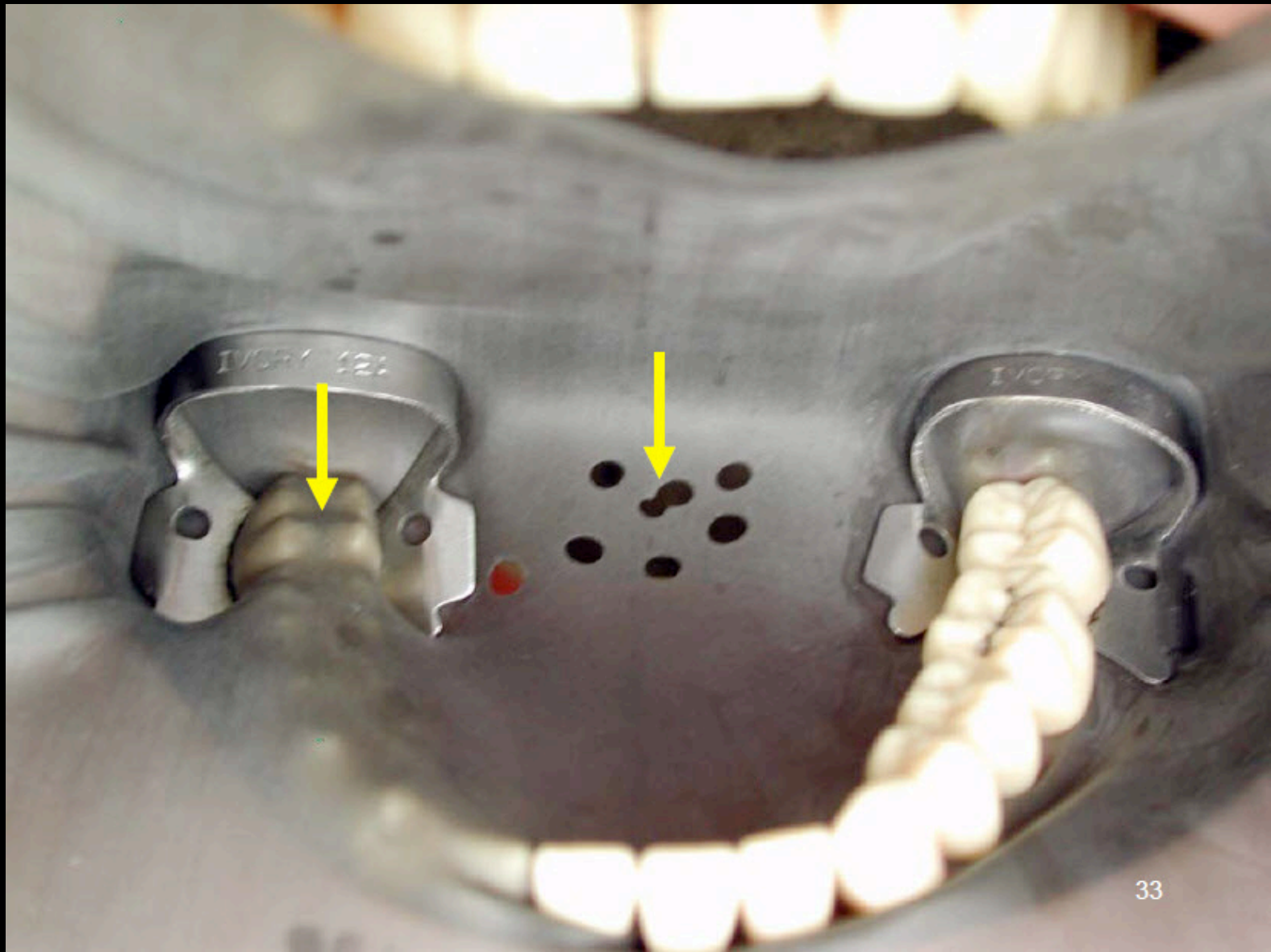


Inverted rubber dam

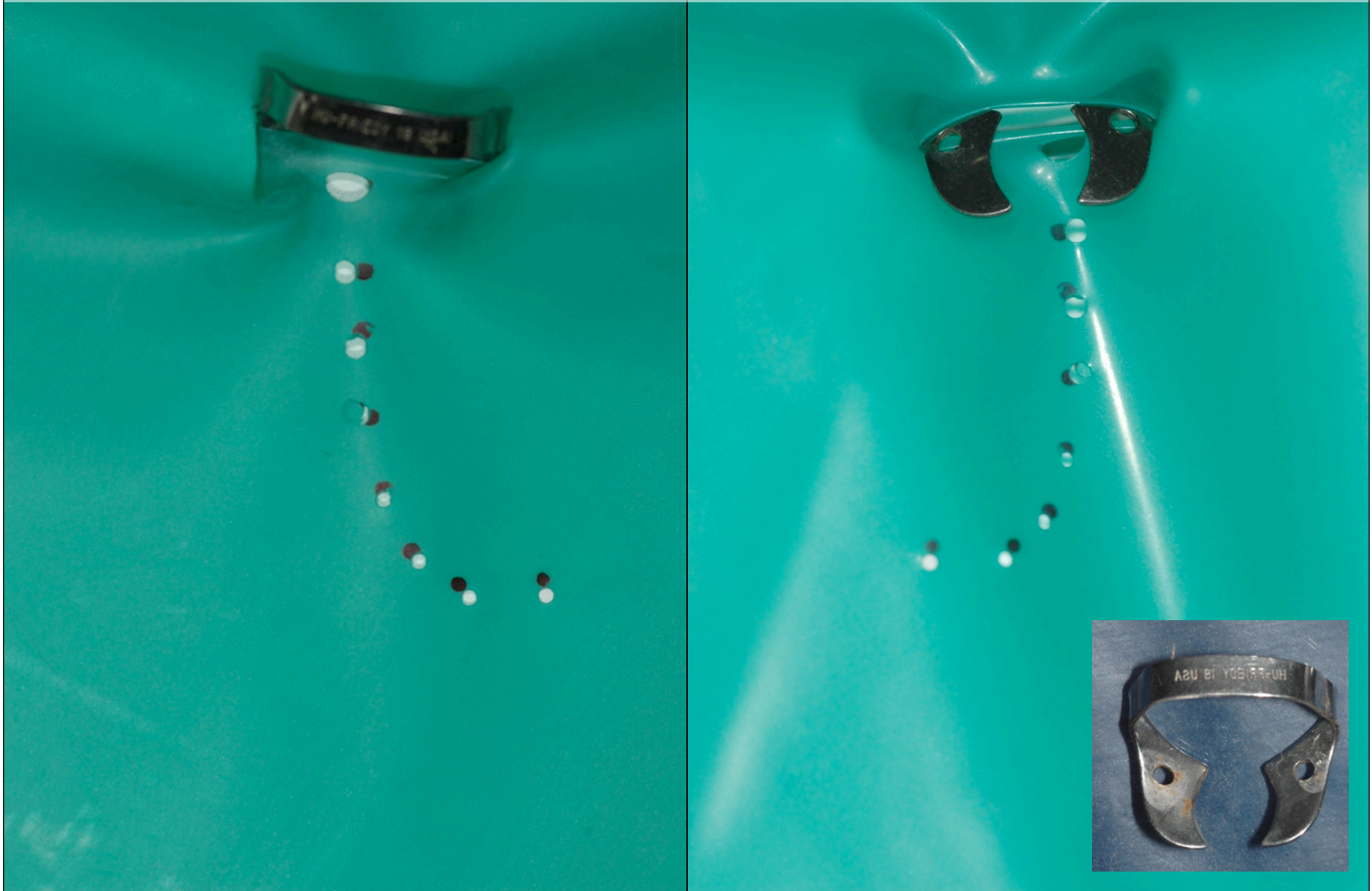








Wingless clamp in dam method of dam application







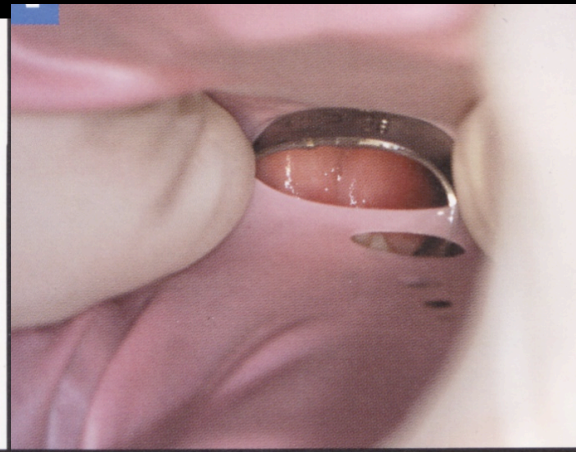
HU-FRIEDY 18 USA







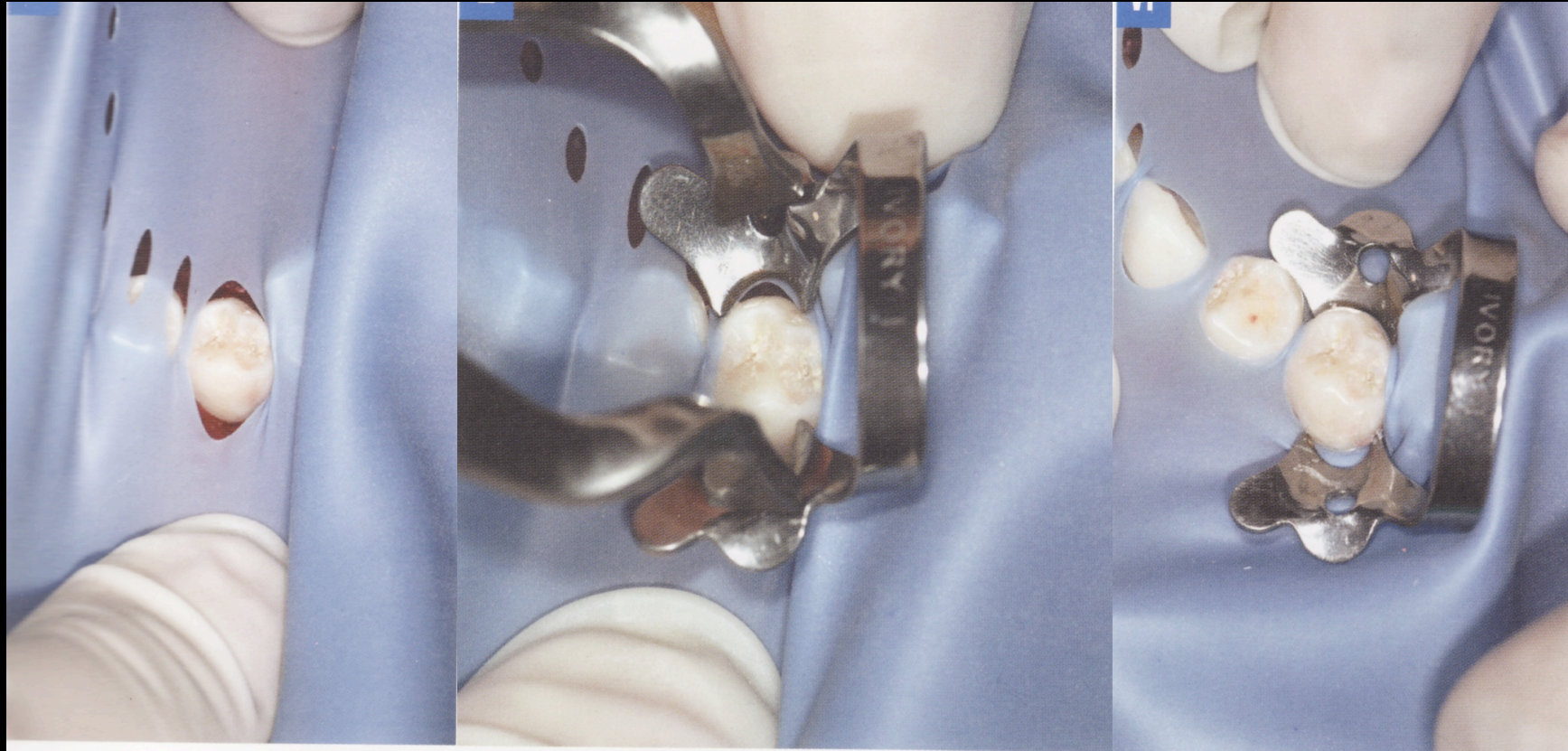
Dam over clamp method of dam application



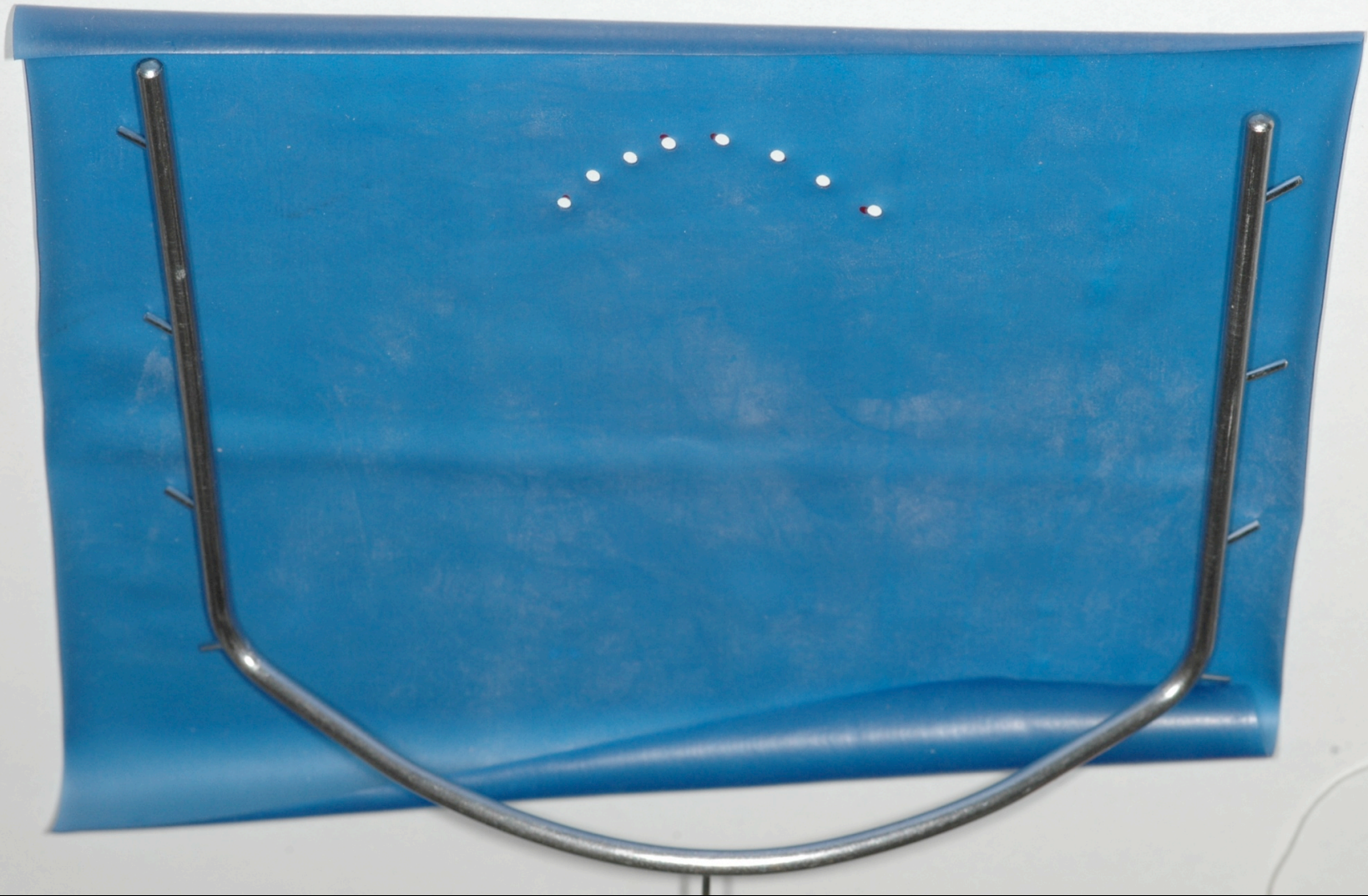
Rubber dam placement

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Damp over dam method of dam application



Don't use clamp method of dam application





















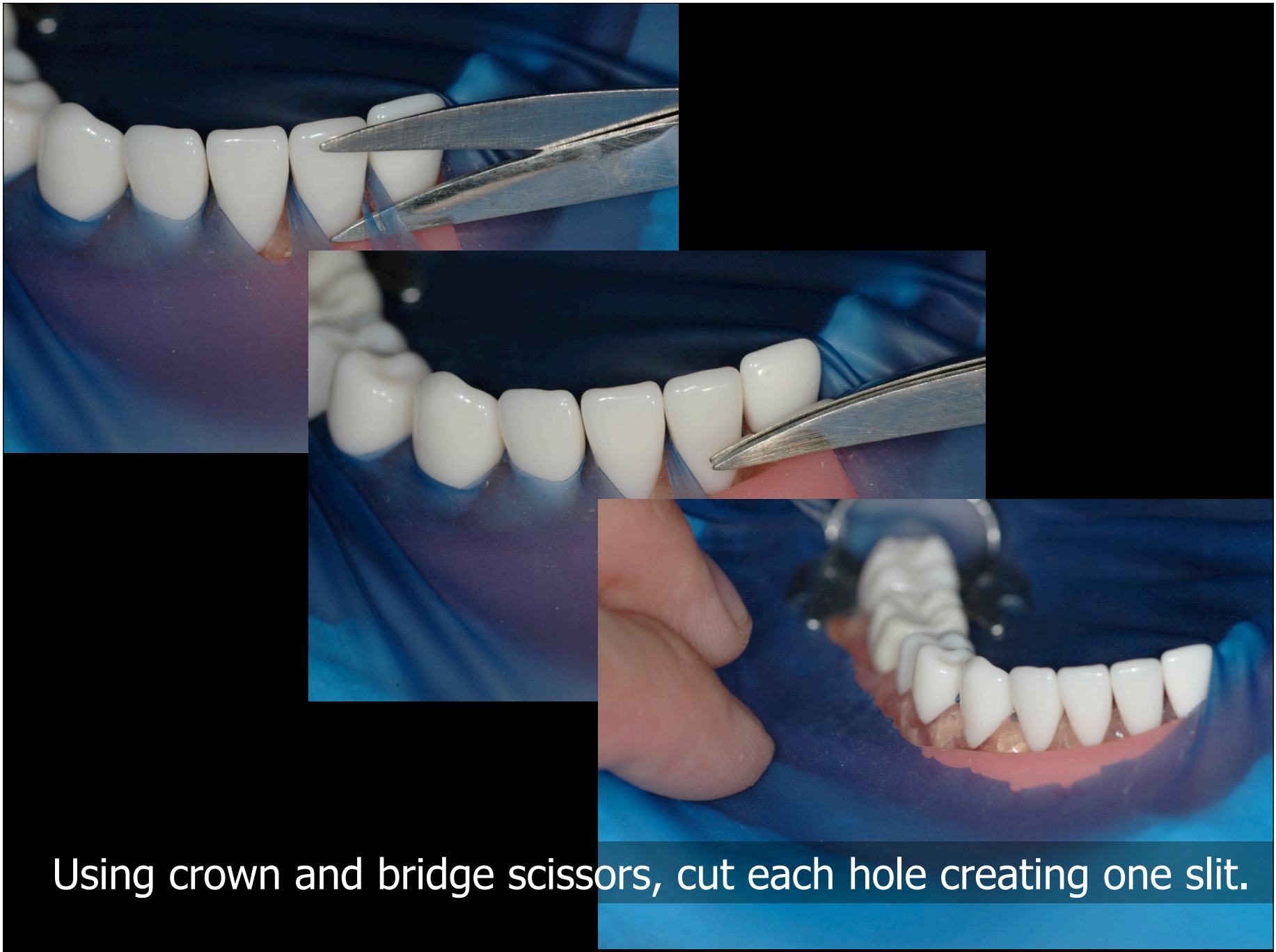
Steps in Removal

Remove any ligatures that are stabilizing the dam.





Using crown and bridge scissors, cut each hole creating one slit.



Using crown and bridge scissors, cut each hole creating one slit.



- Position forceps in clamp.
- Remove everything as one unit.
- Evaluate patient.



Evaluate dam.

Cases that may not use rubber dam

- Clamped tooth has not enough structure / a risk of damages
- Partial erupted permanent teeth
- Some third molars
- Some mal-position teeth
- Asthmatic patient



Conclusions

Method of working field isolation: Rubber dam

- Indications
- Contraindications
- Equipment for Rubber dam application
- Methods of Rubber dam Application & Removal
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