

ISOLATION

Dept. of Conservative Dentistry

ISOLATION

A technique to protect a tooth against contamination from oral fluids during a surgical or restorative procedure, usually through the application of a rubber dam or various other measures.

CONTENT

- Objective of isolation
- Need for isolation in pediatric dentistry
- Methods for isolation

Direct method ←

→ Indirect method → Drugs

- ✓ Rubber Dam
- ✓ Other direct method

- Advantages
- Disadvantages
- Indication
- Contraindication
- Precaution
- Armamentarium
- Sterilization
- Preparation, Placement & Removal of rubber dam
- Radiographic techniques
- Alternative methods
- Variation with age
- Error in application & removal
- Recent advances

- Summary
- References

OBJECTIVES OF ISOLATION



- Dry field
- Access and visibility
- Patient protection
- To improve operating efficiency

It is essential that there should be proper moisture control , good accessibility and visibility as well as adequate room for instrumentation around the working area . Such an environment is necessary for easy manipulation and insertion of restorative materials.

METHODS FOR ISOLATION



- Direct methods

- Rubber dam
- Cotton rolls and cotton roll holder
- Gauze pieces
- Absorbent wafers
- Suction devices
- Gingival retraction cord
- Mouth props

- Indirect methods

- Comfortable position of patient and relaxed surroundings
- Local anesthesia
- Drugs :- Anti – sialogogues, Anti anxiety , Muscle relaxants

DIRECT METHOD

RUBBER DAM



- Rubber dam provides the best possible isolation by far.
- The Rubber Dam is a flat, thin sheet of latex or non latex that is held by a clamp (retainer) and a frame that is perforated to allow the teeth that will be worked on to protrude through the perforations in the sheet while all the other teeth are covered and protected by the rubber dam.
- It is used to define the operating field by isolating one or more teeth from oral environment.

ADVANTAGES



- Improvement of access.
- Retraction and protection of soft tissues.
- Provision of a dry operating field.
- Improve visibility.
- Provision of an aseptic environment.
- Prevention of ingestion and inhalation of foreign bodies.
- Aid to patient management.
- Aid to cross-infection control by reducing aerosol spread of micro-organisms.
- Minimization of mouth breathing during inhalation sedation procedure.

DISADVANTAGES



- Time consuming.
- Patient's objection.
- Trauma to marginal gingiva.
- Trauma to cementum
- Poorly retentive clamps.
- Metal crown margins show microscopic defect following clamp removal.
- Ceramic crowns may fracture at the margins if clamp is allowed to grip the porcelain

INDICATION



- The use of the dam is indicated in virtually all (99.9%) cases.
- Certainly rubber dam is indicated in all operative procedures and endodontics.
- When using high copper amalgam, as it is influenced by moisture contamination.
- It has been used in diagnosis to isolate teeth for thermal test and interdentially during electric pulp testing.
- In periodontal therapy as an aid in root planing and in combination with a periodontal pack as a dressing following flap surgery.

CONTAINDICATION



- In the presence of some fixed orthodontic appliances.
- Partially erupted tooth can't receive a retainer.
- Some third molars.
- Children suffering from asthma , some upper respiratory infections or mouth breathing problems.
- Cannot be used in case of extremely malpositioned teeth.
- Latex allergy.
- Psychological intolerance.
- Patient at risk with transient bacteremia.
- Severe gingival disease.

PRECAUTIONS

- The rubber dam should not obstruct patient's airway and thus should not cover his nose.
- Holes should be prepared in rubber dam for patients with upper respiratory tract obstruction.
- On patients with allergy to latex, latex free rubber dam should be used. Rubber dam napkin can be used to prevent the latex rubber dam from contacting the patient's tissues.



Using vinyl gloves as an alternative to rubber dam. technique.

ARMAMENTARIUM



- Rubber dam sheets
- Rubber dam clamps or retainers
- Rubber dam holder (frame)
- Rubber dam retaining forceps
- Rubber dam punch
- Rubber dam templates or stamps
- Dental floss
- Napkin
- Wooden wedges , orthodontic elastics & commercially available latex cord.
- Lubricant
- Modelling compound
- Scissors

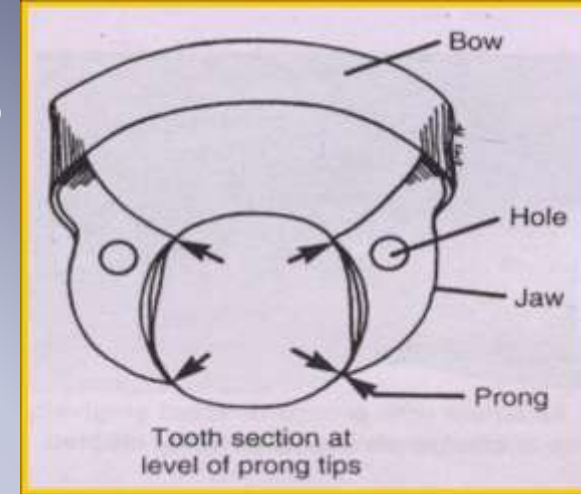
➤ RUBBER DAM SHEETS

- Size – 5×5 inch (12.5 12.5 cm)
6×6 inch (15 15 cm)
- Thickness – Thin - 0.15 mm (0.006 inch)
Medium - 0.20 mm (0.008 inch)
Heavy - 0.25 mm (0.010 inch)
Extra heavy - 0.30 mm (0.012 inch)
Special heavy - 0.35 mm (0.014 inch)
- Colors - green , blue , black , pink and burgundy
Darker color offers better visual contrast.
- Flavors – mint , banana and strawberry
- It has shiny and dull surface. Dull surface is kept facing occlusally since it is less reflective.



➤ RUBBER DAM CLAMPS OR RETAINERS

- Used to secure the dam to the teeth that are to be isolated & to minimally retract the gingival tissue.
- Parts - 4 prongs that rest on the mesial and distal line angle of the tooth and 2 jaws connected by a bow.
- If extended beyond the mesial and distal line angles of tooth –
 - Interfere with matrix and wedge placement
 - gingival trauma is more likely to occur
 - a complete seal around the anchor tooth is more difficult to achieve.



Types :

- ❖ Winged
- ❖ Wingless
- ❖ Serrated
- ❖ Clamp with jaws inclined cervically to engage erupting tooth or severely broken down teeth.
- ❖ Clamps with endo – illuminator system to illuminate pulp chamber and canal orifices.



Winged



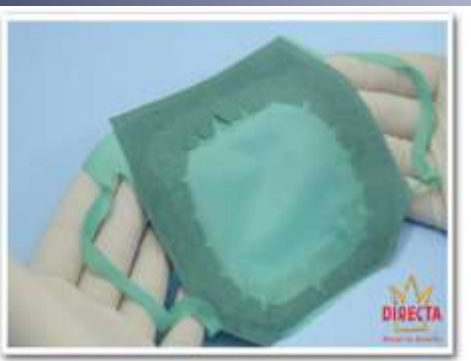
Wingless

➤ RUBBER DAM HOLDERS (FRAME)



- Used to maintain the borders of the rubber dam in position.
- The frame is U shaped and could be an adult or pedodontic , one made of metal or plastic.
- Types – 1) Metallic (Young’s frame) – Holder of a wire 2 mm in diameter. Application is easy and comfortable. Can be easily used in child patient.
2) Plastic (Nygaard ostby frame , Starlite visiframe , Le Cadre Articule , quick dam) – Useful when a radiograph is to be taken without removing the frame.

- Young's Frame
- Nygaard Ostby Frame
- Starlite Visiframe
- Le Cadre Articule Rubber Dam Frame
- Handidam
- Optra Dam
- Instidam
- Dry Dam



➤ RUBBER DAM RETAINING FORCEPS



STOKES



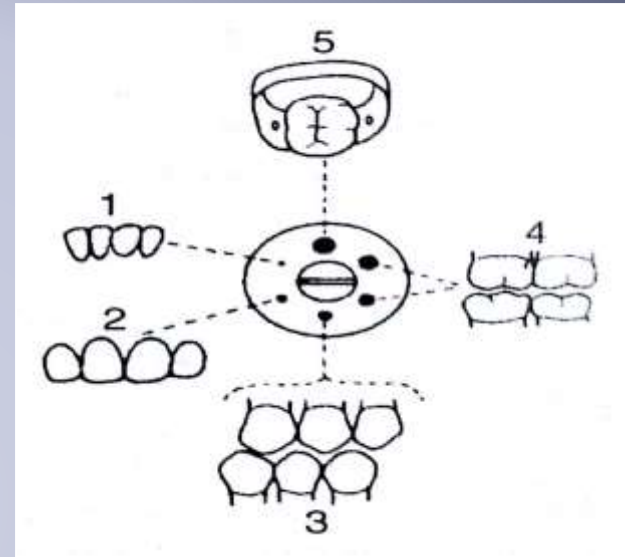
BREWER



ASH type

It is a forcep that holds the retainer and facilitates its placements and removal from the tooth.

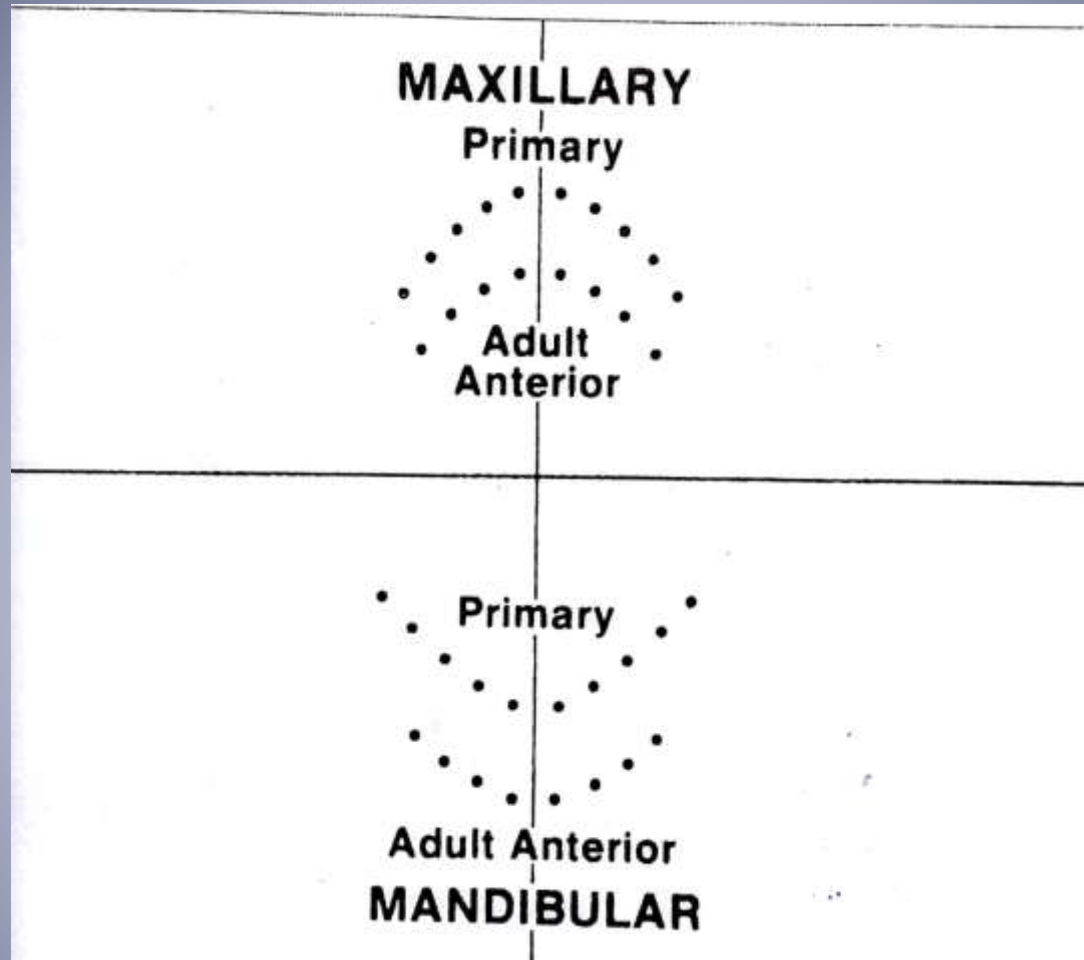
➤ RUBBER DAM PUNCH



It is a precision instrument having a rotating metal table (disk) with six holes of varying sizes and a tapered , sharp – pointed plunger.

Use the smaller holes for the incisors , canines and premolars and the larger holes for the molars. The largest holes is generally reserved for the posterior anchor tooth.

➤ RUBBER DAM TEMPLATES OR STAMPS



Both have positions of the teeth marked on them and are used to transfer them to the rubber dam sheet for holes to be punched.

STERILIZATION



- The rubber dam sheet itself with the rubber dam napkin and any floss or wedges used are disposable and so do not require sterilization.
- The rubber dam frame, clamps and clamp forceps must be carefully cleaned and sterilized between patients, preferably in an autoclave.
- The rubber dam punch should not need to be sterilized frequently, since it only contacts the rubber dam before it is placed in the patient's mouth.
- Punches are made with carbon steel components therefore hot air sterilization should be used.

PREPARATION OF THE RUBBER DAM



Three stages are involved :

Stage-1 : SELECTION OF THE DAM

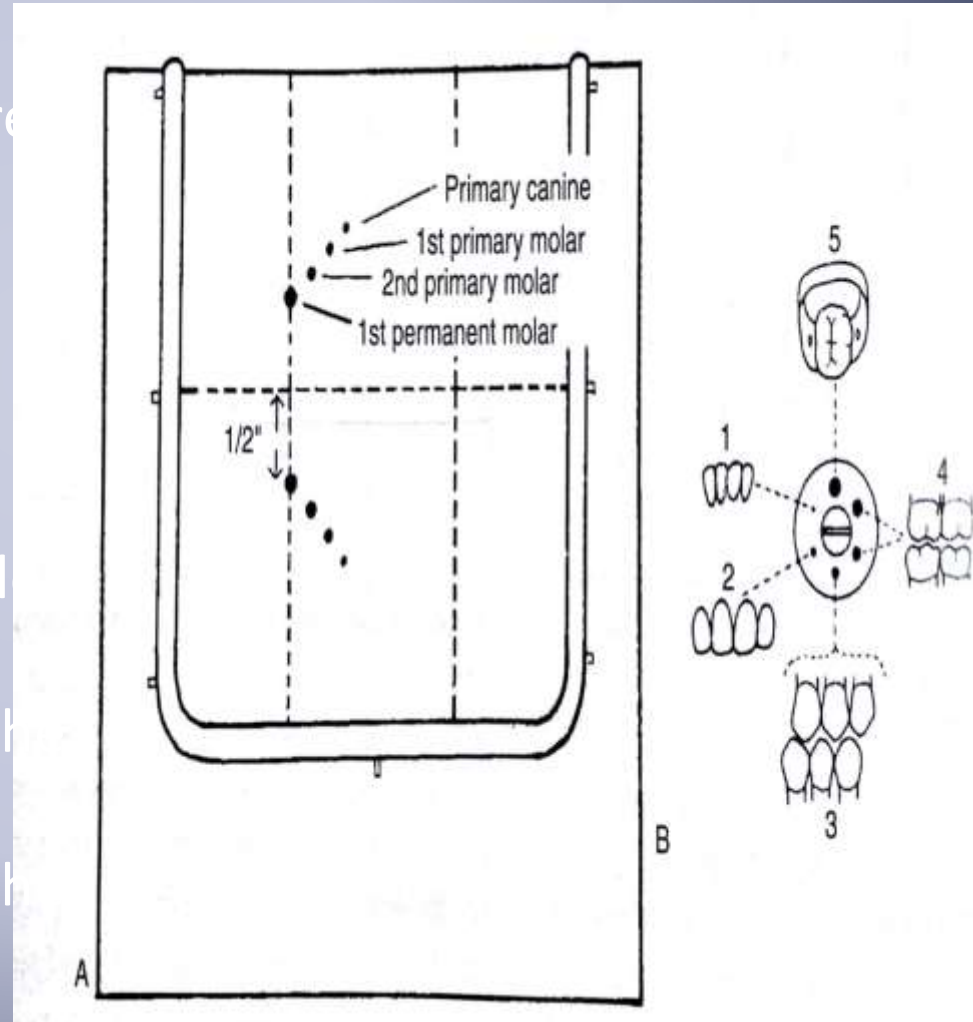
- Heavy and extra heavy dams are used for restorative procedures while medium is considered ideal for endodontic purposes since it:
 - retracts the tissues better than thin type
 - is easier to place than heavier type.
- The natural or translucent rubber dam has advantages for endodontic radiography with the dam in place.

Stage-2 : MARKING THE HOLES

➤ Punch an identification hole in the upper left corner of the rubber dam for ease of location of that corner when applying the dam to the holder.

➤ Isolation of a minimum of three teeth is recommended except when endodontic therapy indicated, and in that case only the teeth to be treated isolated.

➤ The distance between the holes is equal to the distance from the centre of one tooth to the centre of the adjacent tooth, measured at the level of the gingival tissue. This is approximately ¼ inch (6.3mm).



Stage-3 : POSITION OF THE HOLES



➤ Single tooth isolation

- It should be near the centre of the rubber sheet within the area of the sheet corresponding to the quadrant under treatment.
- It is recommended that the top edge of the rubber sheet is positioned to lie above the lip of the patient during endodontic procedures.

➤ Multiple tooth isolation

- If the dental arch is regular, a rubber stamp or template can be used to indicate the positions of the holes.
- Templates are designed to be placed behind the rubber dam and the tooth positions marked with a pen.

PLACEMENT OF RUBBER DAM

Three methods

1. Dam first technique
2. Clamp first technique
3. Clamp and dam together technique



REMOVAL OF THE RUBBER DAM

- Cutting the septa
- Removing the retainer
- Removing the dam
- Wiping the lips
- Rinsing the mouth
- Massaging the tissue and
- Examining the dam

RADIOGRAPHIC TECHNIQUES



- Normal radiographic techniques , particularly film positions have to be modified when the rubber dam frames and clamps are in place.
- Metal rubber dam frames are best avoided
- Variants on the bisecting angle techniques are used
 - The simplest method is to remove the frame and place the film as close as possible to the tooth.
 - Use haemostats to hold the film for the short cone bisecting angle technique. Frame removal is not required.
 - Tongue spatulas can be used in place of haemostats advantage of being disposable and radiolucent.
 - Simple plastic film holder ‘Rinn Eezee Grip’ can be used.

ALTERNATIVE METHODS

- Cervical retainer replacement
- Fixed bridge isolation
- Substitution of retainer with a matrix

VARIATIONS WITH AGE



➤ For younger - change the hole size
- smaller sheet

➤ Primary teeth- HF no.27 retainer

isolation is usually from the most posterior tooth to the canine on the same side.

➤ Young permanent teeth – Ivory no. 14

The jaws of the retainers used on primary and young permanent teeth need to be directed more gingivally because of short clinical crowns or because the anchor tooth's height of contour is below the crest of gingival tissue.

SLIT-DAM METHOD



- Rubber dam use in primary dentition is simplified by the slit-dam method.
- Rather than punching multiple tooth holes in the dam and isolating each tooth in the quadrant, three large holes are punched out 1-2 cm apart and are joined by a scissors cut.
- Such rubber dam application is rapid (5-10 sec) and the desired teeth are completely available for restorative treatment

ERRORS IN APPLICATIONS AND REMOVAL



Errors - Prevent adequate moisture control
Reduce access and visibility
Cause injury to patient

Different types of errors-

- Off centre arch form
- Inappropriate distance between holes
- Incorrect arch form of holes
- Inappropriate retainer
- Shredded or torn Dam
- Sharp tips of no 212 retainer

RECENT ADVANCES

- Hat Dam :
- Cushioning Metal Clamp Jaw
- Liquid Dam / Opal Dam →
- Cushees →
- Fiber Optic Clamps

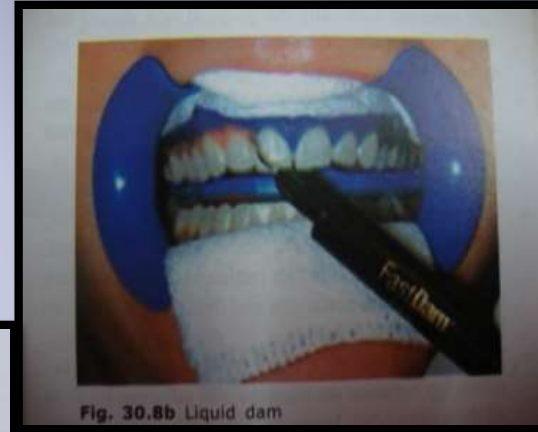


Fig. 30.8b Liquid dam



OTHER DIRECT METHOD

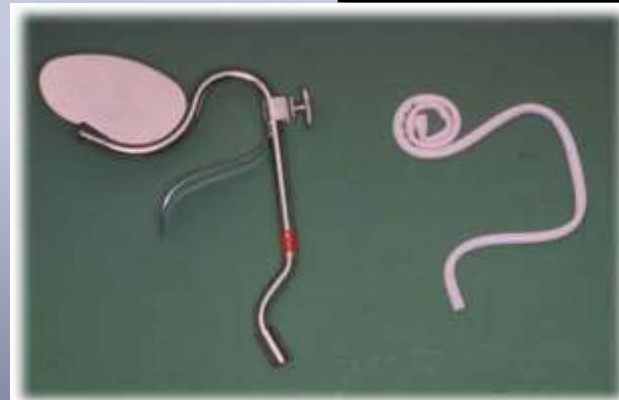


- ✓ COTTON ROLLS
- ✓ GAUZE PIECES
- ✓ ABSORBENT PADS/WAFERS
- ✓ RETRACTION CORD
- ✓ MOUTH PROPS



✓ SUCTION DEVICES

- High Volume Vacuum →
- Saliva Ejector
- Svedopter
- Isolite system



INDIRECT METHOD

DRUGS

- Rarely indicated in restorative dentistry.
- Atropine (antisialogogues) -5mg , 30min before the procedures - reduce salivation
- Antianxiety drugs like valium - 5 to 10mg 30min before.
- Muscle relaxants.
- Medication for controlling gingival bleeding.
- Pain control medication.
- Contraindication - nursing mothers and Glaucoma patients.

SUMMARY



A thorough knowledge of isolation reduces the physical strain on the dental team associated with daily dental treatment, reduces patient anxiety associated with dental procedures, and enhances moisture control, thereby improving the quality of operative dentistry.



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