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Ministry of Higher Education and
College of Dentistry Scientific
Research
University of Mosul

Rubber dam Isolation

A Project Submitted to

The College of Dentistry, University of Mosul, Department of Conservativ in

Partial Fulfillment for the Bachelor of Dental Surgery

By

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Supervised by:

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Certification of the Supervisor

I certify that this project entitled " Rubber dam isolation "was prepared by the fifth-year student Mays Alreem Ammar under my supervision at the College of Dentistry/University of Mosul in partial fulfilment of the graduation requirements for the Bachelor Degree in Dentistry.

Supervisor name: Assistant Professor Fanar Turki Aljadwaa

Date: / / 2025

Acknowledgment I

We thank Allah for giving us the strength and patience to achieve this work, which I wish, will be useful and objective.

Firstly, I would like to express my sincere gratitude to my supervisor Assistant prof. Fanar Turki Aljadwaa for the continuous support and advice. Her guidance helped me in all the time of research. Besides our supervisor. My thanks to University of Mosul college of dentistry. I’m feeling proud of being one of its students. It's helped me to improve my educational level as well as improve my skills.To the most precious thing in my life, my family ،the source of inspiration, kindness and happiness. I am so lucky to have them.

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Introduction

The need to work under dry conditions, free of saliva, has been recognized for centuries, and the idea of using a sheet of rubber to isolate the tooth dates almost 120 years. Its introduction is attributed to Dr. Sanford Christie Barnum, who in March 1864 introduced rubber dam into dental practice He demonstrated for the first time the advantages of isolating the tooth with a rubber sheet .

Many reasons such as, time for rubber dam placement, cost of equipment and materials, difficulty in use and patient acceptance are some of the disincentives to rubber dam use given by the dentists. The majority of these disincentives is based on unfound myths rather than evidenced based reasoning. It is worth spending a few seconds to organizing rubber dam for use in endodontic procedures and thus improves the entire treatment .

Amongst all the methods of isolation of teeth, the ideal and the best method of isolation is rubber dam isolation. Professional organizations rubber dam is considered as the standard of care .

The use of rubber dam has become more critical not only for patients but also for the sake of dentists' safety especially during the epidemic spread of corona 9virus along with other precautions as personal protective equipment, and patient screening, these were suggested for any treatment that produces aerosols and/or droplets .

Also, protects from possible aspiration or swallowing of instruments, drugs, irrigating solutions, and tooth/material debris At the end it is still the most ideal means of isolation till date.

Dental dams are sometimes suggested for use as a physical barrier against the exchange of body fluids during cunnilingus and anilingus, especially for women who have sex with women to protect against sexually transmitted infections (STIs). However, they are rarely used for this purpose, and as of 2012, there is no evidence that their use reduces the risk of STI transmission, including the risk of HIV infection (Elderton RJ, 1971, Ahmad IA European Society of Endodontology, 2006 ,Schindler, 2008, 2009, Cardoso et al. 2018 , Maslamani M. and Mitra, AK., 2018 Ather, B. Patel, N.B. Ruparel, et al., 2020).

Aim of study

The aim of this project is to review the advantages of using rubber dam in all conservative treatment, instruments needed in placing rubber dam and their advances, in addition to get the knowledge about recent alternatives and accessories of rubber dam, also methods of rubber dam placement in unusual .

Chapter ONE

CHAPTER ONE

1.1 Introduction

The technique used to apply the dental dam is selected according to the tooth requiring treatment. Several techniques can be used including single tooth isolation, multiple tooth isolation or split dam technique. The dental dam is prepared by punching one or more holes in the dental dam sheet to enable isolation of the appropriate number of teeth required for the dental procedure. The dental dam is then applied to the tooth, anchored into place using a metal or flexible plastic clamp (chosen according to the tooth and area it will be applied to). The clamp will ideally fit snugly around the tooth along the margin of the gingiva, stabilising the dental dam and preventing contamination of the working area due to saliva ingress. Individuals may experience subjective discomfort due to the tight sensation of the dam clamp, therefore topical anaesthetic (liquid or gel) may be applied to the gingiva at the operator's discretion prior to applying the dental dam.

1.2 Advantages of using rubber dam during restorative procedures

(Harrel SK, Molinari J., 2004, Bhuva B, Chong BS, Patel S 2008,

Anabtawi et al., 2013 ,)

1. Provides dry and clean operating field.

2. Enhanced access, visibility to the working area and prevents iatrogenic misadventures. The latex sheet also allows the dentist to concentrate on the tooth by isolating it from the rest of the teeth and providing a clean work area. It also prevents ingestion or aspiration of dental materials and instruments .

3. Stress free environment.

4. Less fogging of the dental mirror, Increase success rate by 30%.

5. Significantly reduces the microbial content of air turbine aerosols produced during endodontic procedures, thereby reducing the risk of cross-infection

6. Improves the properties of dental materials by preventing the moisture contamination of restorative materials.

7. Enhances operating efficiency and increased productivity. Patient management is simplified by avoiding need to rinse the mouth of debris.

8. Protects dentists and dental assistants against infections which can be transmitted by the patient‘s saliva .

9. Minimizes patients’ conversation during root canal treatment and encourages them to open their mouth .

10. Eliminates need for repeated change of cotton rolls due to flooding of saliva or root canal irrigants.

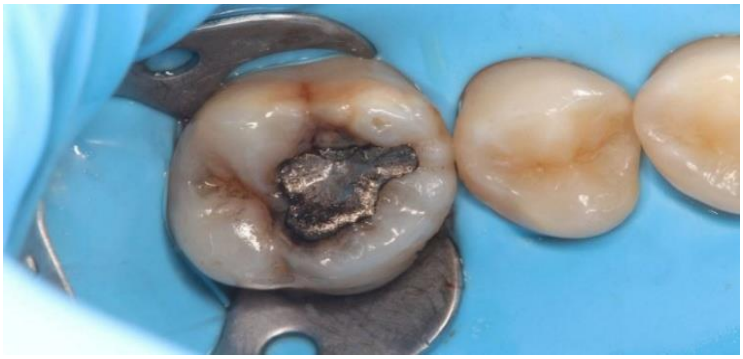


Figure 1: rupper dam isolation

1.3 Disadvantages of using a rubber dam(Hill, Edward E.; Rubel, Barry S.,2008)

1.Takes time to apply (but saves more time during procedure)

2.Cost.

3.Communication with the patient can be difficult.

4. Incorrect use may traumatize the gingival tissues

5. Insecure clamps can be swallowed or aspirated.

1.4 Contraindication to the use of the rubber dam

1- Asthmatic patients.

2- Epileptic patients.

3- Mouth breathers.

4- Extremely malpositioned tooth.

5- On porcelain crowns.

1.5 Instruments needed for rubber dam isolation

Main components:

1- Rubber dam sheet.

2- Rubber dam punch.

3- Rubber dam clamps.

4- Rubber dam forceps.

5- Rubber dam frame.

1.Rubber dam sheets

In Endodontics, where one tooth is isolated at a time, the 5”x5” format is more than sufficient, even for working in the posterior sectors of the mouth. The 6” x 6” format is useful in restorative dentistry, where it is necessary to isolate several teeth at the same time, dark and light colors are available. Available in several colors, but green and blue colors are preferred because they provide good contrast with the surroundings.Rubber dam sheet has a shiny side and a dull side. The dull side should face the operator so as to reduce any light reflected from it.

Figure 2: Rubber dam sheets

Black color, photodam (by style Italiano). Also, provide the contrast color to allow clear visual of the tooth or teeth during procedures & photographing. Avoid it in deep margin elevation (DME): you can't see if there is leakage (open margin) or not.

Figure 3: Rubber dam sheets Black color

2. Rubber dam punches

Rubber dam punches are used to make round holes of different diameters (0.7 – 2 mm) on the rubber dam, depending on the tooth to be isolated. It is necessary to check whether the dam opening is exactly round, without irregularities. To determine this, it suffices to punch a hole in a dam sheet and then enlarge this opening by stretching the sheet in different directions. The dam should not tear (Bhuva et al., 2008).

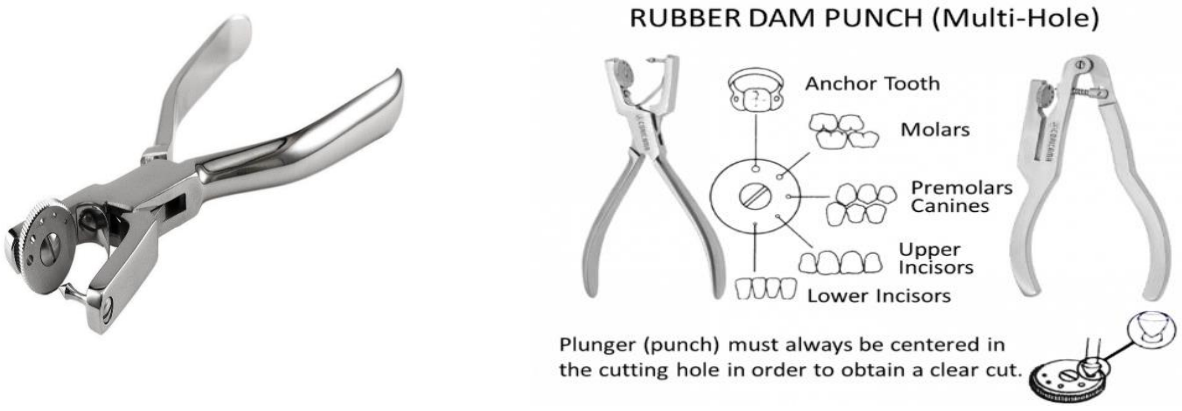


Figure 4 : Rubber dam punches

3. Rubber dam clamp forceps

Rubber dam forceps is necessary to open the clamp and position it around the tooth. The Ivory forceps are preferable, because they allow the dentist to apply direct pressure toward the gum, which is frequently necessary to position the clamp securely below the bulge of the tooth crown.

There are two designs of forceps:

1- Straight one.

2- S-shape one: it is better than straight one as it is widely opened.

Figure 5: Rubber dam clamp forceps

4. Rubber Dam Clamps

The fit of the rubber dam essentially depends on the choice of the appropriate clamp and its correct positioning clamps are classified as winged or wingless. The positioning techniques vary slightly. Sometimes wingless clamps are preferred, as they are less bulky and may be used easily in the posterior sectors in patients with particularly thick cheeks.

The most commonly used clamps are:

Front teeth - IVORY # 6, IVORY # 9, IVORY # 90N, IVORY# 212S, IVORY # 15

Premolars - IVORY # 1, IVORY # 2, IVORY # 2A.

Molars that are incompletely erupted or already prepared for full crown- IVORY # 7, IVORY # 14 .

Asymmetrical molars, in particular the second and third IVORY # 10, IVORY # 11 IVORY # 12A, IVORY # 13A.

Wingless, to be used when the wings obstruct the working field -IVORY # W8A IVORY # 26N .

The clamps are modified to improve their grip and allow a more precise fit. A premolar clamp can also be used on a small molar or frontal tooth, or a # 9 clamp on a hemisected root of a lower molar; any such adaptation is permitted, as long as the final result i.e. correct placement of the rubber dam is achieved. The only danger is fracture of the rubber dam clamp once it has been positioned in the mouth. If this occurs, the elasticity of the dam will cause the fragments to beejected from the patient's mouth. It is therefore prudent to secure the clamp with dental floss and anchor it to the dam frame (Hajim Wakabayashi ,1986 ,Vedavathi et al., 2013).

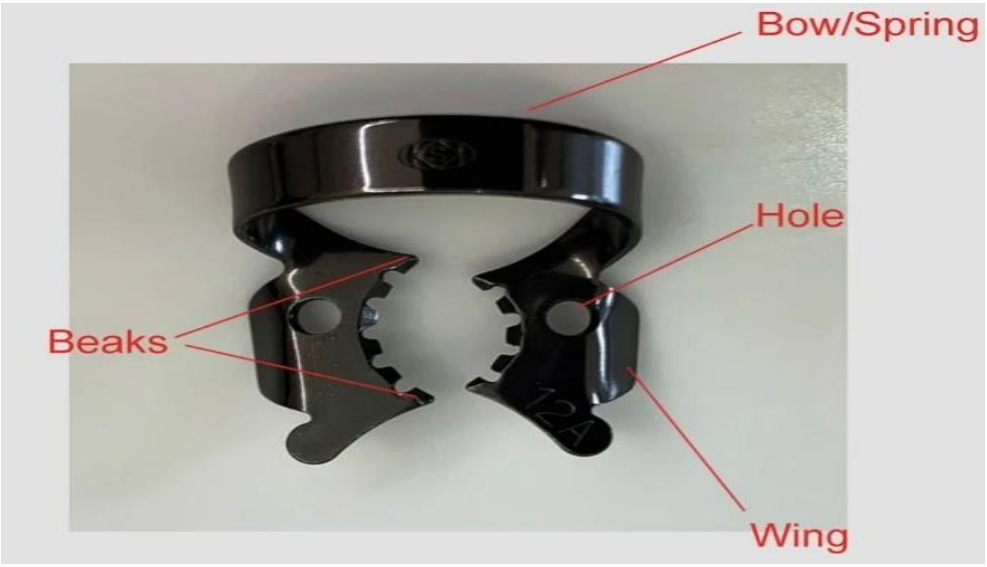


Figure 6: Rubber dam clamp

Some type of clamps

1 Tiger clamp

These are the clamps with serrated jaws. These serrations will increase the stabilization of the clamp on the partially erupted or broken down teeth .

Figure 7: Tiger clamp

2- S-G (Silker-Glickman) clamp

This is a clamp with anterior extension which allows for retraction of the dam around a severely broken-down tooth, and the clamp itself is placed on a tooth proximal to the one being treated. It is made from durable cast stainless steel, which is autoclavable, corrosion-resistant, flexible and long lasting. It is ideal clamp for molar isolation. Its extended wings allow for rubber dam placement around the teeth with minimal tooth structure.

Figure 8: S-G (Silker-Glickman) clamp

3. Distal clamp

Available for molars, both decidu-ous and permanenteasy to reach distal part of molar. Both Deciduous and Permanent. Easy to reach distal part of molar.

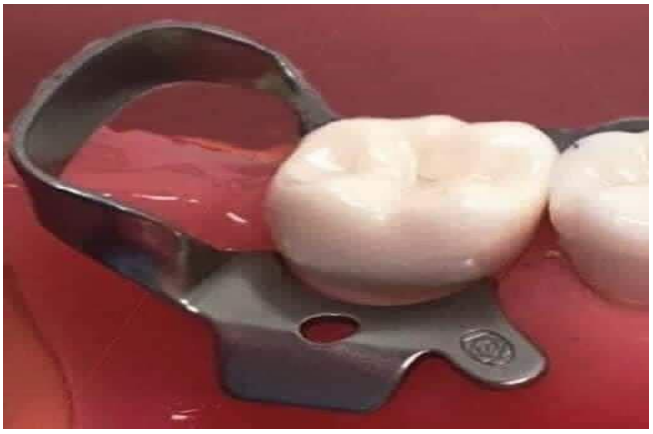


Figure 9: Distal clamp

4- Soft clamp

Universal gentle alternative to metal clamps ,SoftClamp's unique design distributes the applied force evenly, reducing the pressure on the contact area. The grip-tight coating of the clamps' jaws allows SoftClamp to engage the tooth surface gently but firmly, minimising the risk of slippage and eliminating the cause of patient discomfort and iatrogenic damage to the teeth, radiolucent in x-ray.

Figure 10: Soft clamp

5-Gold colored clamps

These clamps have diamond grit on their jaw to improve the retention of the clamp.

Figure11: Gold colored clamps

5. Rubber dam frame

Rubber dam frames support the edges of rubber dam, rubber dam frame is necessary to maintain tension in the dam so that the lips and cheeks may be retracted well. Some frames, including the Young frame, are made of very thin metal; others, including the Nygaard-Ostby or Starlite frame, are plastic, and available as Articulater frame.(Sauveur G.,1997).

Figure 12: Rubber dam frame

1.6 Rubber Dam Accessories

1. Dental floss.
2. Wedge.
3. Oralseal.
4. Liquidam.
5. Teflon.

1.Dental Floss

It can be used as in the following:

▪Used to tie clamp before insertion in oral cavity to avoid accidental aspiration.

▪Facilitate rubber dam insertion between teeth (pass contact).

▪floss tie to secure rubber dam or retract it more gingival.

▪Also required for testing interdental contacts.

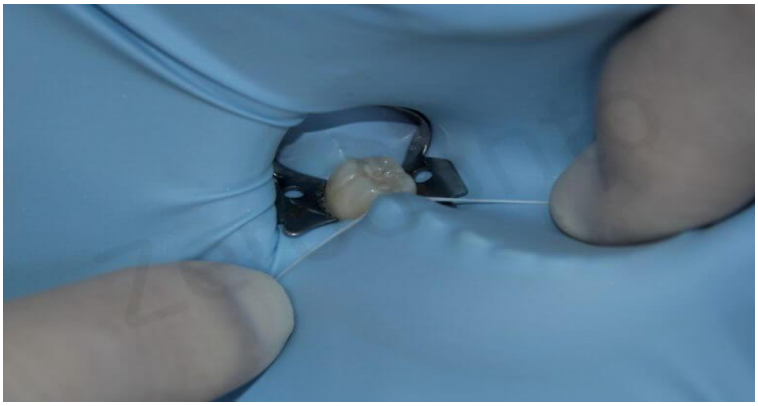


Figure 13: 1.Dental Floss

2. Wedjets (Hygenic)

These are stretchable elastic stabilizing cords made from natural latex rubber and used as a rubber dam retainer. These are a faster and easier method of retaining the rubber dam than using conventional clamps. It is placed like dental floss over the rubber dam in the interproximal areas of the teeth, holding the rubber dam in position. It is available in extra small, small and large sizes. It reduces patient

trauma and discomfort caused by metal clamps. They are especially used in the isolation of anterior teeth.

Figure 14: Wedjets (Hygenic)

3.oralseal

OraSeal Caulking material when an adequate seal is difficult to obtain with compromised teeth or roots. OraSeal Caulking material may also be used to repair rubber dam leaks. It seals the rubber dam when performing a porcelain repair, protecting gingiva from hydrofluoric acid. Deliver into undercuts and below implant bars, precision attachments, etc. to prevent cold cure acrylic or impression material from locking into empty spaces. Fill in gingival embrasures of splints and bridges to facilitate easy cleanup of permanent cement. Also used to fill in screw holes on implant impressions prior to making impressions.

- Adheres under water and saliva.
- Provides a protective seal against gingival exposure to peroxide or hydrofluoric acid.
- Ideal for blocking out unwanted spaces for impressions.
- Effectively adheres to wet rubber dams, tissue, teeth, and met.

- OraSeal Putty material has a stiffer consistency than the Caulking material, which some doctors prefer.
- Apply OraSeal caulking material with Black Mini or White Mac delivery tips to prevent the leakage of rubber dam during treatment .
- Certified gluten (free Schneider, K; Kirkwood 2019)

Figure15: oralseal

4. liquidam

Light-cured rubber-dam liquid is dedicated for:

gingiva protection during dental treatments: whitening, etching, microabrasion, sandblasting, endo, etc. sealing rubberdam ,other procedures requiring intraoral protection.

To seal rubber dam: Isolate the working area (tooth, teeth, alveolus) using rubber-dam. In order to seal rubber dam, apply the layer of the liquid on the edge of the gingiva and the rubber dam. Cure the preparation for 15 seconds using a

polymerization lamp. Conduct the curing process evenly in a scanning motion. Then, proceed the dental treatment.

After the treatment is completed, lift off polymerized Rubber-dam liquid using the instrument on either side and remove Angie Segatto, (2023).

Figure 16: liquidam

5. Teflon

Teflon is very useful in day-to-day dental practice.

It comes in several thicknesses, with the most useful being those designed for gas pipes (thicker) and water pipes (thinner). The thinner water pipe tape is used by the author for isolating teeth during bonding, as it passes between contacts and prevents deflection of indirect restorations, which can result in open contact points. Care must be taken during placement because the tape tears very easily,

The teflon tape twisted into a braid serving as a retraction cord. And to blocking interproximal undercuts, aiding tissue retraction, and enhancing visibility in scans

for temporary restorations. and to anchored in place with a rubber dam clamp to avoid displacement during rinsing and drying procedures . (Hannes wachtel ,2019).

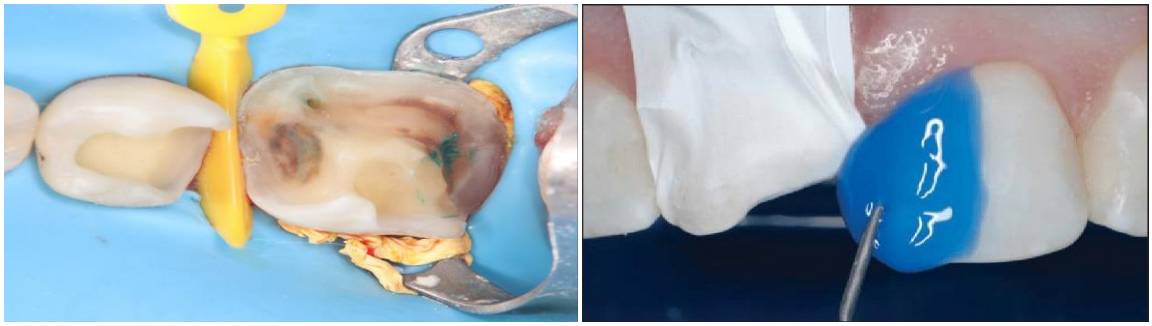


Figure 17 : Teflon

1.7 Placement methods of the dam (Martinelli, Luca 2019.)

1. Dam over clamp method

A wingless clamp is placed on the tooth. It is recommended that a finger be maintained over the inserted clamp to prevent its dislodgment until its stability on the tooth has been confirmed. The operator checks stability by engaging the bow of the clamp with an instrument and firmly attempting to pull it occlusally. If the clamp rotates on the tooth, it is not stable and should be repositioned or replaced. Minute instability may be overcome by using impression compound to stabilize the clamp. Often the prongs may require grinding to improve stability. The tissue side of the dam is lubricated in the area of the holes. Then, with a finger on each side of the distal hole in the dam, the dentist (or assistant) stretches the dam so that the hole is enlarged and appears to be an open slit; the hole is then carried over the bow and jaws of the clamp, The hole at the opposite end of the row (usually for the lateral or central incisor on the opposite side) is then passed over the appropriate tooth, and the septa are worked through the interproximal contacts.

2. Dam with clamp method

the clamp is placed into the distal hole so that the hole is stretched over the wings of the clamp from its tissue side, the frame is attached. The forceps are inserted into the holes of the clamp, and the clamp, dam, and frame are carried as a unit into place. After the stability of the clamp is confirmed, the dam material on the wings of the clamp is pulled off the wings with finger tension or with a bladed instrument such as a plastic Instrument.

- Advantage: Indicated in third molar regions.
- Disadvantages: Restricted vision during clamp placement, Trauma to gingiva

3. Clamp after dam method

The dam is applied to the teeth and then the clamp is placed. This technique, occasionally necessary, is the most difficult. This technique is generally performed when the rubber dam is used to restore class V cavities or non-carious cervical lesions using the gingival retractor clamp no. 212. This clamp is wingless and large, and therefore the techniques described previously do not apply.

4. Split dam method

In this technique two holes are punched in the dam that corresponds to teeth anterior and posterior to the teeth in question. The dam is then stretched over the clamped tooth and to the anterior tooth where the dam is stabilized with the widget. The dam between the holes is then cut with scissors.

5. Teeth with orthodontic wire

Orthodontic wire prevents tight sealing of the rubber dam sheet. Tight seal can be achieved by the use of oraseal, orabase, periodontal dressing, mixture of dentin adhesive and zinc oxide powder. Oraseal being the material of choice, other method is to position the clamp above the orthodontic attachment.

Chapter TWO

CHAPTER TWO

DISCUSSION

The first reference of dental dam use in dentistry was over 150 years ago1 and this is now accepted as the standard of care (whenever possible) in operative dentistry, and is mandatory for endodontic treatment and vital pulp therapy. European Society of Endodontology.(*Shanon Pate ,2006)*

One of the clearest reasons for using dental dam is to protect the patient's airway from accidental aspiration or swallowing of instruments, irrigants and debris. A patient ingesting, or worse still, inhaling debris or a dental instrument (for example, an endodontic file or bur) which could have otherwise been avoided with the use of dental dam is difficult to defend. In the last ten years, the Dental Defence Union found that the five most common instruments or materials to be accidently swallowed or inhaled were: endodontic files/burs, filling materials, implant screwdriver, prosthesis (crown/veneer/implant) and scaler tips. They advise minimising the risk of these events by using dental dam, high-volume suction and good equipment maintenance. (Hoppenbrouwers ,2019)

Chapter THREE

CHAPTER THREE

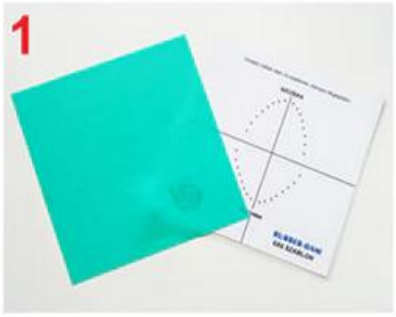
CONCLUSION

More often than not, dentists are using materials which don't like moisture, you can imagine that this is tricky when working in someone's mouth! Effectively, whenever we might use a white filling or be placing a restoration such as a veneer or onlay, then a rubber dam would help us. when a root canal treatment is being completed, we are aiming to ensure that the tooth is clean. This means that we really want to ensure that no saliva and bacteria can enter the tooth. A rubber dam is very important for this procedure. The dam also acts to protect the patient when small instruments are used.

For a dentist, we are always striving to ensure that our work lasts for it's maximum amount of time. Less is more when it comes to providing care for our patients. Therefore, if we can provide care which will last for longer for our patients then we feel like we are doing a good job. when a rubber dam is in place, the moisture in the mouth is controlled. This way, the dentist can ensure that treatment is more predictable, and often more comfortable for patients.(Vedavathi, B., Sreenivasa Murthy, BV., Nadig, RR. And George, JV , 2013)

Case report

Take a sheet of rubber dam and a sheet of rubber dam template.



Place rubber dam on top of template and adjust.

Using a marker pen select a particular tooth to be isolated.

Make a hole using rubber dam punch.

Stretch rubber dam sheet on a metal frame.

Place clamp wings in the hole.

Open the clamp using rubber dam forceps and position it around the tooth.

Correctly positioned rubber dam sheet.

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