

# Rubber dam: an overview

Frankly, **Chris Emery**, a specialist endodontist from Portsmouth, does give a dam.

## Fuss and bother

If you are very lucky the dentist that you work with will use rubber dam for root canal treatments and some restorative work, so this article won't be a lot of use to you. However, if you work with one of the 85% of dentists who do not use rubber dam, consider it a waste of time and say that 'patients don't like it', then read on. Furthermore leave this magazine open at this page on your dentist's desk and wait for the above reaction – I guarantee it! When Dr Sanford Christie Barnum first described the use of rubber dam in the *Dental Cosmos* in 1864, I don't think he had any idea of the fuss and bother he would be causing. To those of us who use rubber dam routinely for many procedures and certainly all root canal procedures, it seems a simple and natural thing to do. However, to the majority of UK dentists out there who do not use rubber dam, the procedure seems difficult, unnecessary and intrusive. The simple reply to this opinion is that it really isn't! The main aim of this article is to try and persuade the non-believers that rubber dam is an easy, ordinary and necessary treatment modality. The secondary aim is to share a few rubber dam 'tips' for the experienced dam user. I realise this might place you in an undesirable position – but blame me. I am very used to dentists sounding off about the perils of rubber dam!

## Have a go

There is no 'wrong way' of placing rubber dam; if it works for you and your dentist, your way is great! The following examples are clinical scenarios that work for me, bearing in mind I am an endodontist. When I was first working in my own general dental practice over 40 years ago, I was not using rubber dam, and my endo was probably rubbish. I attended a lecture by Chris Stock, now retired but then a new endodontic voice on the lecture circuit.

He literally inspired me at that meeting and after a deeply embarrassing conversation with Chris at the coffee break, I drove home like Saul on the road to Damascus determined to 'do better'. Interestingly 'could do better' was always the mantra of my school reports, and when you think about it, this is not a bad attitude to have for our patients. To those of you reading this article who are trying to do better, why not join me on the road to Damascus and 'have a go' with rubber dam, or even better, try and persuade your boss to use it.

## Four handed support

Working as I do in full time endodontic referral practice, I rely heavily on my dental nurse for her four handed support. When we know the tooth and procedure we are going to carry out we will discuss the operative details. 'Lower left 6, PW' would refer to the tooth and the typical wingless lower molar clamp that I would employ. The nurse will then punch the relevant hole in the dam and present me with a clamp forcep with the PW clamp on. I simply place the clamp on the tooth, the nurse passes the dam and I place it over the clamped tooth, followed by the frame. The whole process usually takes about 20 seconds. As we continue the endodontic treatment, the nurse is heavily involved in the procedure. We both find this is a very significant part of our working environment. Indeed patients will often comment after an hour under rubber dam during an endodontic procedure 'how well we work together!' I'll let you guess my nurse's reply.

## Dam benefits

The benefits of using rubber dam for the patient, the operator and the assistant are:

- Improved access and visibility
- Reduced operative time

- Containment of irrigants – bleach
- Reduced stress: operator-patient-assistant
- Secures airway and GI tract
- Improved cross infection control.

## Improved access and visibility

This is really a no brainer, particularly given the welcome increase in the use of magnification.

## Reduced operative time

The problem here is that if you use rubber dam and you are good at placing it – simple! If you don't like it and you are no good at placing it, it is difficult and time consuming, so get good at it – practise!

## Containment of irrigant – bleach

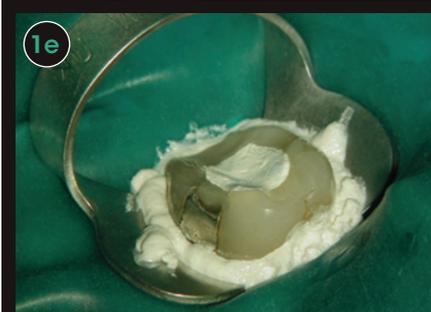
If you are going to achieve good root canal results, then you need to use sodium hypochlorite. Bleach tastes awful; if you don't believe me try some! You need to use rubber dam when using bleach in the mouth.

## Reduced stress

Ask any experienced dental nurse who works with rubber dam what they prefer when assisting with the removal of a large amalgam from an upper seven with or without rubber dam. You can guess the answer. So many of my patients remark on how 'relaxing' an hour long root canal session was under rubber dam. From the operator's perspective, particularly carrying out root canal with magnification, your perspective and focus is enhanced hugely. The ability to find the eponymous second mesial buccal canal becomes a reality. From the nurse's perspective it is mind bogglingly better.

## Secures airway and GI tract

If while carrying out root canal your patient is clever enough to swallow or even worse inhale



Figs 1a-e Single molar isolation using rubber dam

an endodontic file, they will very sensibly successfully sue your boss and the rest of us will pay for it. Well actually I don't want to, so please use rubber dam!

**Improved cross infection control**

There are two separate, independent research papers published in the late 1980s that showed

categorically a huge 90% reduction in aerosol-born cultivatable microorganisms when using rubber dam.<sup>1,2</sup> This is real evidence-based dentistry: eat your heart out HTM 01-05. It is certainly your boss's responsibility to provide you with an optimum working environment, and using rubber dam has to be part of that.

Set out below are some clinical examples of the way I use rubber dam. I have two overriding principles: I use a wingless dam clamp and place the dam over this and I hardly ever use clamps on anterior teeth, and significantly I would not contemplate carrying out root canal therapy without rubber dam. If the patient declines rubber dam following reasoned explanation, I would decline to carry out the endodontic procedure.

**CLINICAL CASE 1**

*Single molar isolation*

Single tooth endodontic isolation of a lower molar is carried out using a PW clamp with floss threaded through the clamp eyes in order to safeguard against clamp fracture. The clamp is picked up in the clamp forceps and placed over the desired tooth (Fig. 1a). Following removal of the clamp forceps, the stability of the clamp is tested digitally. The dental nurse meanwhile has punched a hole in a piece of dental dam at the desired tooth position. This is aided by pre-stamping the dam with a rubber stamp pattern. There are numerous examples of dam to choose from of various thicknesses; my choice is a green, extra heavy type. If there is any indication of the patient demonstrating a latex allergy, then it is wise to use a latex free sheet of dam. Interestingly it seems easier to handle rubber dam when wearing protective gloves; I am not sure this might be the only advantage of protective gloves! Before the dam is passed to the operator some lubricant is placed on the internal surface of the dam. In my situation we use a baby moisturising cream. We have used all sorts over the years, but this product has the advantage of being water soluble and tasteless. The dam is passed by the nurse in such a way that the operator may simply pass the lubricated dam over the bow of the clamp (Fig. 1b) and then 'flick' the dam over the buccal and lingual clamp surfaces (Fig. 1c). The rubber dam frame is then attached to the dam (Fig. 1d). After some practice this procedure can take as much as 20 seconds. Usually I then place a layer of barrier material such as OraSeal to prevent any microleakage of irrigants such as sodium hypochlorite to leak under the dam (Fig. 1e).

**CLINICAL CASE 2**

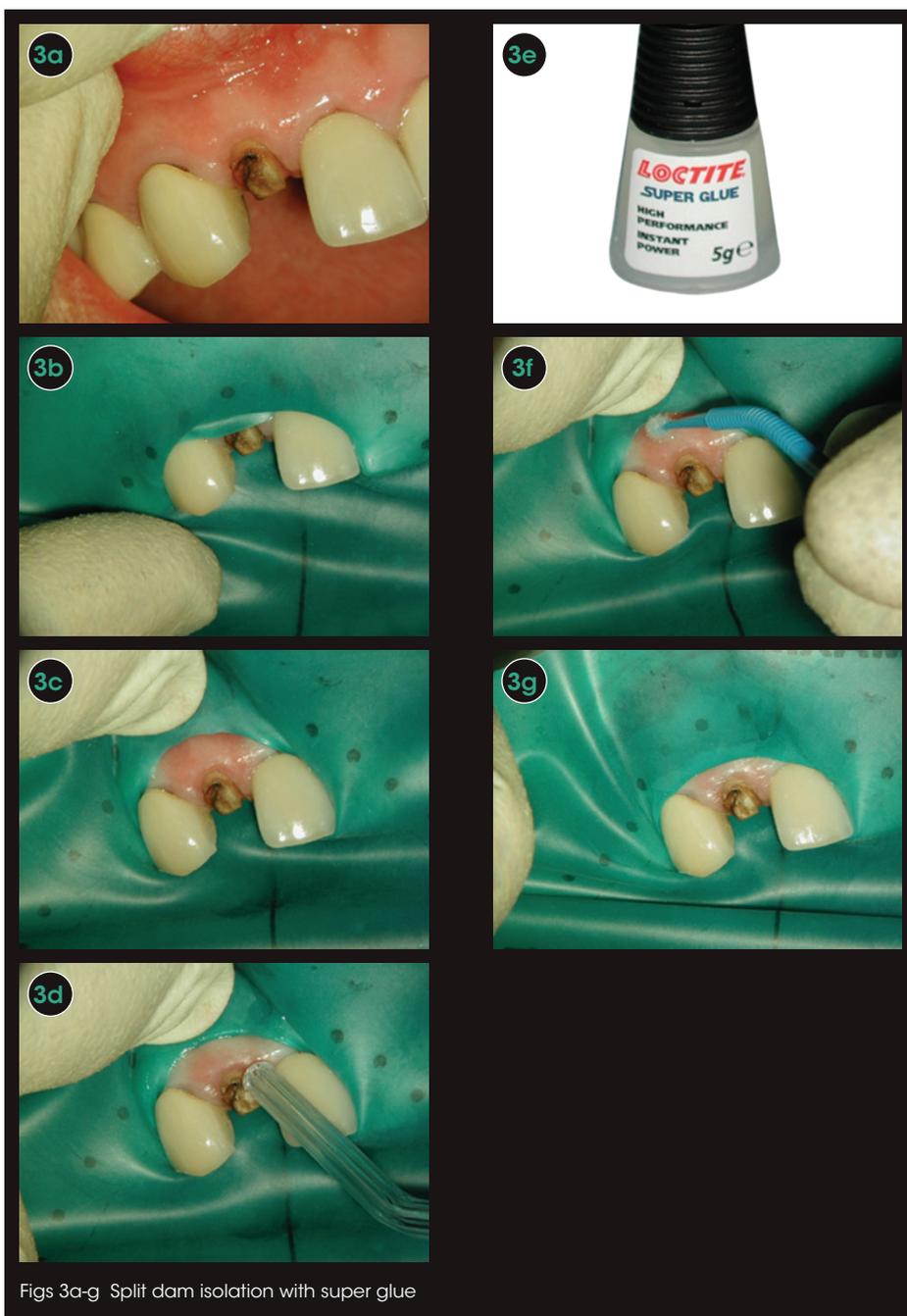
*Split dam isolation of upper molar*



Figs 2a-c Split dam isolation of upper molar

Figure 2a shows a temporised upper first molar with a missing crown with over prepared axial walls which make it impossible to retain a dam clamp. Also the loss of tissue distally would be difficult to isolate. To overcome this problem we use 'split dam'. A wingless clamp is placed over the tooth distal to the tooth to be isolated, the dam is punched at this tooth and the tooth anterior

'I would not contemplate carrying out root canal therapy without rubber dam.'



Figs 3a-g Split dam isolation with super glue

Figs 4a-d Isolation of lower incisor using multiple teeth

to the isolate, and a cut with scissors is made between them. After placing the lubricated dam over the distal tooth it is stretched mesially and knifed through the mesial contact of the forward tooth, usually with the help of dental tape (Fig. 2b). OraSeal is then applied around the tooth to completely isolate it (Fig. 2c).

### CLINICAL CASE 3

#### *Split dam isolation with super glue*

Frequently patients will attend with a gingival level fractured crown/tooth that needs immediate root canal therapy to place a post in order to place a provisional (Fig. 3a). This can present with a real isolation challenge. Often split dam is the answer. Dam is simply placed over the adjoining teeth; this will often

leave an unwanted 'flap' of dam over the buccal margin of the tooth, inhibiting access and preventing proper isolation (Fig. 3b). Simply remove this flap of dam, pull it up over the mucosa (Fig. 3c), dry it with the 3/1 syringe (Fig. 3d) and place a small amount of cyanoacrylate glue over the dam and the mucosa (Fig. 3e) and dry with air.

I use Loctite superglue (Figs 3f-g). Always have protective glasses on the patient and manipulate the adhesive very carefully.

### CLINICAL CASE 4

#### *Isolation of lower incisor using multiple teeth*

If possible when isolating incisor(s) a piece of dam with multiple holes is placed (Figs 4a-b). Retention is aided by the use of Wedgets (Fig.

4c); this is a stretchy rubber cord that contracts below the tooth contact. This is followed by the placement of OraSeal to complete isolation (Fig. 4d).

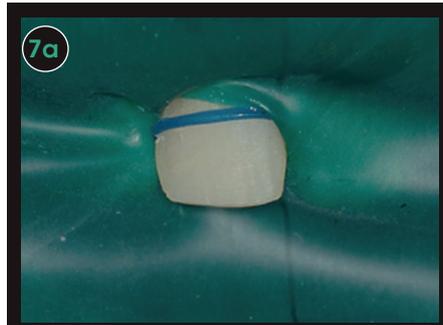
### CLINICAL CASE 5

#### *Restoration of upper left first premolar to allow matrix placement*

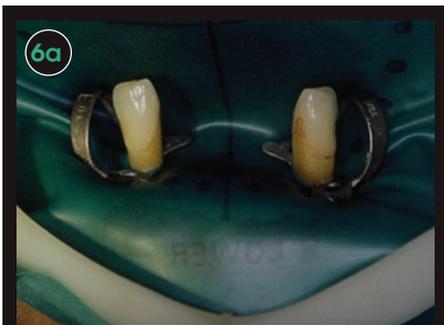
In anticipation of placing a matrix on the premolar (Fig. 5a) to allow delivery of the restorative material, the premolar clamp is placed on the tooth distal to the 'target' tooth and three holes punched in the dam. As in Case 1, the lubricated dam is worked over the bow of the clamp and pulled over three teeth separately. Following completion of the tooth preparation a matrix can be simply placed and wedged etc (Fig. 5b), the restorative material



Figs 5a-b Restoration of upper left first premolar



Figs 7a-b Isolation of partially erupted immature teeth



Figs 6a-b Root canal treatment, restoration and doming of lower canines in an elderly patient

applied and the restoration finished. Obviously the occlusion needs to be checked after removal of the dam.

**CLINICAL CASE 6**

*Root canal treatment, restoration and doming of both lower canines in an elderly arthritic patient, in preparation for lower overdenture abutments*

This is probably not a very common procedure in today's 'dental market place' (Figs 6a-b)

I have always found the use of rubber dam in elderly patients with cervical arthritic

conditions of particular value, as they simply are not able to lie flat, but with the help of multiple cushions and rubber dam, treatment can be facilitated.

**CLINICAL CASE 7**

*Isolation of partially erupted immature teeth*

These teeth can be a real challenge, but if you are carrying out a pulpotomy or pulpectomy procedure for a young patient, rubber dam is of particular importance. In Figure 7a an orthodontic separating ligature (elastic) is passed over the tooth on a pair of rubber dam clamp forceps after placement of a sheet of dam; this has the effect of holding the dam in place.

In this case (Fig. 7b) the upper incisor teeth

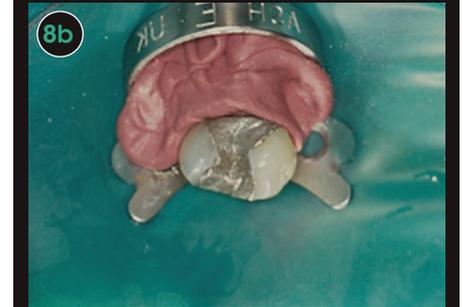
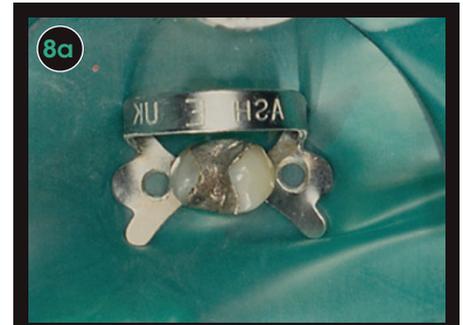


Fig. 8a Endodontic occlusal access inhibited by dam clamp tipping forward  
Fig. 8b Placing a small piece of impression compound over the clamp bow to retain the clamp in the desired position

are fully erupted but very little retention can be obtained by multiple tooth retention and the tooth will not retain a clamp. A small portion of composite is placed on the enamel surface and spot cured. This can be placed on either the buccal or palatal surface or both. It is left over the duration of the treatment if multiple visits are indicated and removed carefully when treatment is complete, similar to an orthodontic bracket.

**Miscellaneous rubber dam examples**

*Case 8*

This case demonstrates the difficulty when one (usually) single premolar with no alternative dam retention is isolated. The dam clamp tends to tip forward inhibiting good endodontic occlusal access (Fig. 8a). Take a small piece of impression compound, warm it in hot water and place it distal to the tooth over the clamp bow (Fig. 8b), cool the impression compound with air and when it hardens it will retain the clamp in the desired position.

*Case 9*

Shows the use of rubber dam while the patient is orthodontically banded up. Don't let the presence of orthodontic brackets put you off. In fact they can be quite helpful (Fig. 9).

*Case 10*

When placing rubber dam over multiple lower

'Don't let the presence of orthodontic brackets put you off. In fact they can be quite helpful.'

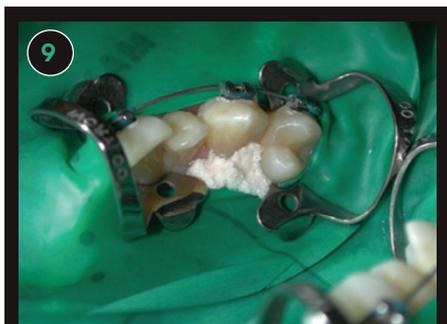


Fig. 9 Using rubber dam with orthodontic bands



Fig. 10 Marking the tooth to be worked on



Fig. 11 Dehydration of the enamel following rubber dam isolation

incisors I usually place a marker pen 'dot' on the target tooth, thus assuring that the correct tooth is worked on (Fig. 10).

### Case 11

This is an interesting photo of anterior teeth following rubber dam isolation for 45 minutes. It demonstrates significant dehydration of the enamel (Fig. 11). This enamel rehydrates in saliva in a matter of minutes, but it does demonstrate the necessity for taking shades before placing the dam.

### Aiding the uninitiated

I do hope that these cases and examples I

have shared with you will help the uninitiated dental care professional to understand rubber dam and its uses. Maybe you can even persuade your boss to give rubber dam a try!

1. Cochran M A, Miller C H, Sheldrake M. The efficacy of rubber dam as a barrier to the spread of microorganisms during dental treatment. *J Am Dent Assoc* 1989; **119**: 141-144.
2. Samaranyake L P, Reid J, Evans D. The efficacy of rubber dam isolation in reducing atmospheric bacterial contamination. *ASDC J Dent Child* Nov-Dec 1989; **56**: 442-444.

Chris qualified at The Royal London Hospital in 1968 and went on to specialise in endodontics, completing a Master's programme at the Eastman Dental Institute in 1994. Chris has recently been awarded the Fellowship in Dental Surgery by the Faculty of Dental Surgery of The Royal College of Surgeons. He lectures nationally and internationally and provides hands-on postgraduate endodontic courses in his own surgery.

[www.chrisemeryendodontics.co.uk](http://www.chrisemeryendodontics.co.uk)

### VITAL READER PANEL

#### Melanie Joyce, Dental Therapist



'I think working with rubber dam is a preference thing and I, like many dental therapists, haven't used it since finishing my training. As mentioned in the article many clinicians see its use as time consuming and awkward, however I have been thinking recently about giving it another go for treating children. I find my patients often want to swallow and close their mouth and a rubber dam will help to combat the need for this, allowing me a clearer field of vision and hopefully speeding up my preparation time which will allow me to do more for the patient in the same time. I also like to place composite materials in deciduous teeth due to its ability to bond to the teeth and although I'm confident my isolation techniques are adequate, there would be no doubt with rubber dam. I remember learning that rubber dam is useful in paediatric dentistry for many reasons and so think it's time I followed the author's example, got the clamps out and had another go!'

#### Christine Horbury, (Dental Nurse) Clinical Skills Educator



'The need to work under dry conditions, free of saliva, has been recognised for centuries, and the idea of using a sheet of rubber to isolate the tooth dates back almost 150 years! However, due to the impact of costs and times, the use of rubber dam is limited and patient safety is a risk. In Leeds Dental Institute, where I currently work helping train dentists and dental therapists, the placement of rubber dam is taught very early on and always used when a tooth needs isolation. Training dental nurses to place rubber dam seems like a plausible solution - but I don't feel dental nurses are having the opportunity to perform this.'

#### Shaun Howe, Dental Hygienist



'This is relevant to all members of the dental team. Dental hygienists and therapists should be using rubber dam especially for sealants, but many newly qualified DCPs find it too intimidating. That said, when I was a dental assistant in the early 1990s I had the privilege of working with an American "endodontologist" and we used rubber dam for pretty much everything we did (including normal restorative work). This was before any real legislation governing dental assisting and I was trained by my dentist to place the dam and became very effective at it! With practice using rubber dam becomes pretty much second nature and very, very easy!'