

OptiDam - SoftClamp - Fixafloss

Operations without sterile cover – is this a new trend?

Dr. Dirk Stockleben, Doctor of Dentistry, Practice Fränkische Str. 36, D-30455 Hannover

Introduction

Would you let yourself be treated for appendicitis by a surgeon who avoided working with sterile covers and a clean environment, just because it made things easier? Or by a surgeon who relied on their dental assistant to prevent contamination of the operating area by suction? A surgeon who is convinced that by dispensing with sterile precautions, healing and prognosis will not be endangered? If your answer is no, then this is the right article for you.

The rubber dam, in use now for more than 140 years in dental medicine, is still a very disputed item. Since the introduction of suction equipment, the use of rubber dam has become less important and even by contemporary cross infection, health and safety standards the subject is of much debate. On the one hand it is an essential tool and on the other hand it is viewed as unnecessary and difficult to use.

Its first use was rather more because of external force during studies than because of any belief it was a necessity in practice. Initially there was insufficient information and evidence to illustrate the efficient technology and the advantages of using the rubber dam. Therefore it is only too understandable that due to the difficulty of using the traditional model of dam the sceptic would question its real relevance in practice.

All the necessary work procedures hold manifold sources of error and put many potential users off working with the rubber dam. Even when the necessity was recognised it was often argued that it is difficult to handle. This is not surprising because this subject is hardly touched upon in undergraduate education. The perplexity is further increased by the various methods of application and is seen an obstacle for its use rather than increasing motivation.

However, whoever has come to realise the advantages for his team and patients will no longer want to miss out when it comes to endodontic, restorative or orthodontic treatments (*Ahlers, Schluckebier R*).

There are many good reasons for using a rubber dam:

- **The treatment area remains dry and clean**

The need for frequent changes of dental cotton rolls and rinsing out by the patient no longer applies. Many patients have the pleasant feeling that the tooth is being worked on outside the oral cavity.

- **Improved access and visibility**

The work area is easily visible and accessible and the soft tissue is held in place. Complete and absolute concentration on the tooth to be treated is possible and even for the patient there is a more relaxed atmosphere.

- **Materials are not affected by saliva**

The rubber dam is a real quality feature particularly when it comes to intraoral bonding techniques. Studies prove that bonding can fail if the tooth surface is contaminated by saliva. Inadequate coating of the bonding agent can lead to loss in retention, premature loss of fillings, marginal discolouration and an increased risk of decay. This can be problematic because the dentist accepts a 24-month guarantee.

- **Protecting the patient from aspiration and fluids**

From a forensic point of view protection from aspiration and contamination (e.g. when cleaning amalgam) play a very important role today. If a rubber dam is not used this may be considered an act of negligence (in accordance with § 276 paragraph 2 of the ¹BGB); at the same time such action from a judicial point of view may constitute grounds for injury to the body arising from negligence (as under § ²StGB). Under civil law this leads to a claim for compensation and damages for pain and suffering. Under criminal law this could possibly lead to a criminal conviction. It should not be forgotten that using a rubber dam means using the best available technology which was introduced as early as 1864.

- **Protecting dental team from infections**

Protection against infection is more important than ever and it is not only the ³RKI guidelines which play a role here. Infectious diseases such as tuberculosis or hepatitis are on the increase and masks do not offer effective protection in this respect.

- **Asepsis**

Aseptic conditions cannot be achieved as already explained above by using dental cotton rolls.

- **Improved efficiency and time saving measures**

At the start of treatment it takes some time to put the rubber dam in place. Colleagues/assistants can make all the preparations and, if given the right training, in the majority of cases will be competent enough to put everything in place themselves. This then limits the interruptions during treatment, saving time and enabling better treatment results. In addition all hands are free for the treatment and not busy trying to keep things dry.

- **Improved patient comfort**

As also shown from the investigations (*Kakehashi et al.*; *Sjögren et al.*; *Gergeley EJ.*), many patients value the rubber dam. There are fewer treatment instruments in the mouth and freedom of movement is not restricted by mirrors and dental rolls. Breathing is not obstructed if the right system is chosen and the patient can be treated while relaxed. Many patients even fall asleep during endodontic treatment when a rubber dam is used. Investigations by *Whitworth JM et al.* and *Lynch CD* show, that 60% and 77% of English and Irish dentists respectively when asked about endodontic treatments do not use a rubber dam and the choice of irrigating solution will depend on its use. The rubber dam users rinsed significantly more frequently with sodium hypochloride. An alarming result when the possible forensic consequences are considered.

¹ Bundesgesetzbuch – German Code of Law

² Strafgesetzbuch – penal code

³ Robert Koch Institute

In Germany the results are probably similar. Non-observance of the valid guidelines of specialist organisations (e.g. ⁴DGMZ) also favour the effects in the forensic field as already discussed. This is a situation which can easily be avoided and be of additional benefit to the dental practice. Why not briefly explain to the patient the advantages of keeping the work area completely dry? To date we only had one patient who for psychological reasons did not want a rubber dam. An explanation was given to all the other patients about aseptic work and being able to move the tongue freely and they found the treatment a pleasant experience.

Liebenberg recommends its use during preparation, taking an impression and cementing indirect restorative treatments. Although this procedure has advantages it is time consuming and difficult to achieve with conventional techniques. Even if almost all conservative and many prosthetic treatments can be carried out using a rubber dam, its use in endodontics is the first and simplest step.

Thereafter bonding techniques can follow during any necessary routines. All those involved will come to appreciate the advantages. In order to achieve this aim, new simple rubber dam technologies are necessary. This report is intended to show the simple use of the newly developed **OptiDam™** from KerrHawe.

It has been possible to remedy the following disadvantages of the conventional rubber dam by means of the OptiDam™ design:

- **Various application techniques depending on circumstances**

Either the clamp is placed on the tooth first and the dam put over this, or the clamp is fixed into the dam using the clamp frame and then put on to the tooth.

- **Instrumentation**

Template, pin, rubber dam punch, rubber dam clamp, dental floss, wedges and various clamps are needed.

- **High clamp force and possible injury to enamel and gums**

Using steel clamps with the necessary retaining force can cause injury to soft tissue and in demineralised tooth enamel zones can cause fractures.

- **Narrow working conditions in the molar region**

Because of the flat rubber dam and its mounting a restrictive cone-like working area is created.

- **Restriction of breathing**

Often the dam is positioned directly over the patient's nose and prevents either subjective or objective breathing. Cutting into the relevant area brings relief but changes the fitted position, which encourages salivation during X-rays.

The OptiDam™ concept from KerrHawe

The traditional design of a flat dam was abandoned with the aim of developing a system which would meet the demands of dental practice and allow easier handling. **OptiDam™** is a three-dimensional preformed untreated medium-strength latex dam. There are two designs, **posterior** and **anterior** and both have the appropriate anatomical shape.

There is no perforation because OptiDam™ already has ready-made nipples on all tooth positions 7 – 7, or 6 – 6, which can be cut off with scissors. These are located in the anatomically correct place and have the correct size. The use of a template and a punch is therefore completely unnecessary. The dams are individually packed and are unlike conventional packaging units where the dam has to be treated with talcum powder to avoid adhesion to each other. Talcum powder can however act as an allergen. On the other hand genuine latex allergy is rare.

The design of OptiDam™ is oval and it has a beaded edge. This is a real plus when it comes to patient comfort. The patient's nose is no longer covered and sensitive patients no longer feel so severely hemmed in. The beaded edge holds back the irrigation solutions which with normal dams could come into contact with the patient's skin or clothing.

Similar to the design of OptiDam™, the autoclavable plastic frame is oval-shaped to match the contour of the face. Sharp projections or spikes have been avoided benefiting the patient's comfort. The consistent anatomical design allows an optimum treatment area while reducing feelings of stress in the patient. This innovative dam and frame design alone has eliminated the various problems of the traditional rubber dam.

One definitive factor for flat dam failure is insufficient perforation. The anatomically correct placement of holes is vital. If the gaps are too small placement is difficult and if they are too large saliva or irrigation solutions will seep into the oral cavity. Perforated templates help but here again mean an additional step in the work process. If the punch is not working correctly it will tear into the dam. Because of its intelligent design, using OptiDam™ is very easy. Patients can even breathe through their mouths because OptiDam™ on account of its contours and gentler pressure on the lips does not completely seal the oral cavity. A suspended saliva ejector can produce a vacuum.

The procedure in the anterior region

The following steps are applied for use:

1. Cutting away the relevant rubber nipples (**Fig. 1**)
2. Fixing the OptiDam™ into its frame (**Fig. 2**)

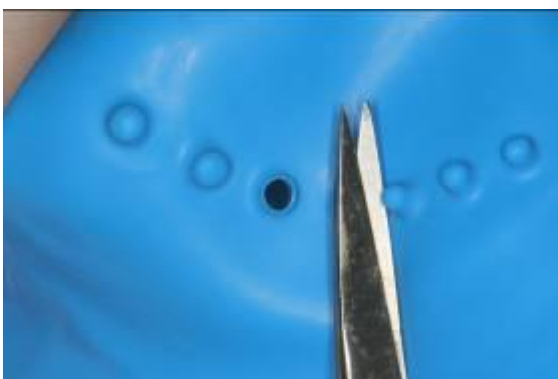


Fig. 1: OptiDam™: cutting away nipples



Fig. 2: OptiDam™: placed in the frame

For an optimum working area the whole anterior teeth segment, 3-3 or 6-6 can be clamped. An advantage also brought to bleaching treatment is that both jaws can be clamped at the same time which is comfortable for the patient and convenient for the dentist.

Cutting off the appropriate nipples automatically provides the correct distance to the neighbouring teeth.

Fixing the anterior OptiDam™ is greatly simplified using **Fixafloss®** (**Fig. 3**). Fixafloss® is a combination of a dental floss and a conical, clamping silicon clamping element at the other end. This latter part acts as a stop or wedge. Application is incredibly easy: using the dental floss part, the OptiDam™ is introduced through the approximal contact area, then the Fixafloss® is simply pulled in a labial direction until the silicon stop fixes the dam securely in the approximal space. Therefore OptiDam™ can be quickly and comfortably positioned within the shortest time possible and without any disturbing metal clamps or complex knots. Because of the symmetric shape of the anterior OptiDam™ the patient's nose remains clear with the lips being kept away from the surface of the tooth (**Fig. 4**).



Fig. 3: Fixafloss®: dental floss with clamp element



Fig. 4: Fixafloss®: fixing the anterior OptiDam™

The procedure in the posterior region

In order to use the posterior OptiDam™ in the premolar region, clamps are not an indispensable requirement. The 3D contour with its tension-free fit allows the dam to be secured using Fixafloss®.

Because of OptiDam's shape a high retention force from the clamps is no longer required. Therefore autoclavable plastic clamps (**SoftClamp™**) with less retention force are enough to fix the rubber dam securely in place (**Fig. 5**).



Fig. 5: SoftClamp™: autoclavable plastic clamps

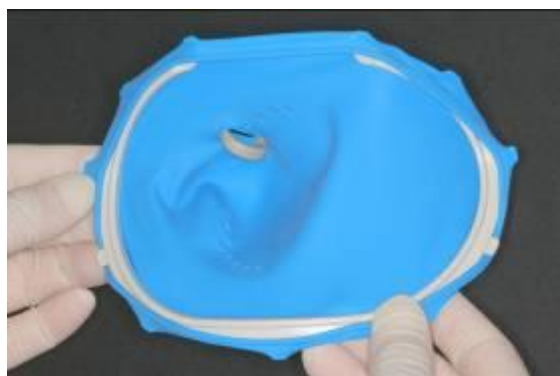


Fig. 6: SoftClamp™: fitting into OptiDam™

Here also there are four steps for use:

1. Cutting away the relevant rubber nipples (**Fig. 1**)
2. Fixing the OptiDam™ into the frame (**Fig. 2**)
3. Fixing SoftClamp™ using the protrusions into the perforations (**Fig. 6**)
4. Positioning the SoftClamp™ clamp on to the tooth (**Fig. 7**)



Fig. 7: SoftClamp™: positioning on to the tooth

We prefer this sequence as it prevents any danger of confusing the left and right side. The open side of the frame points towards the nose and the quadrant to be treated can be detected immediately. With the anterior OptiDam™, the upper jaw is marked by a plus sign.

It is now up to the dentist whether only the tooth being treated or the whole jaw segment is isolated. However as it only takes a few seconds longer and clearly makes subsequent work easier, isolating a jaw segment is recommended. In the mesial region it is enough to use Fixafloss® for fixation. This makes work particularly easy because tooth isolation and fixation can take place in one step. There is no need to use wedges or to change instruments unnecessarily.

It is recommended that the SoftClamp™ is fixed on the distal neighbouring tooth of the tooth undergoing treatment. This provides a better overview of the area being worked on as the clamp arc will not obstruct the view. In the case of endodontic treatments this is advantageous particularly on teeth 16 and 26, without patient comfort being compromised.

OptiDam™ with Fixafloss® and the Softclamps in themselves provide a coherent system for absolute dryness. The anatomical 3D-shape of the dam means for the dentist a work area which is easier to see as it provides more room while fitting neatly but without tension. For the patient this means more comfort and fewer restrictions. As its use is in principle similar to conventional rubber dam techniques but much easier, it makes a change-over easy.

For first-time users OptiDam™ is very easy to apply because there is no need for a template or punch. The only requirements are a sharp pair of scissors and rubber dam clamp forceps. Due to the correct arrangement of nipples it is also possible for colleagues to perfectly position OptiDam™ into place. OptiDam™ has many clinical advantages and obvious time saving qualities, causing less stress while increasing patient comfort. Even if there is little space in the molar region, it is possible to concentrate on the work without having to still bother with the rubber dam. The patients value the additional advantages with respect to safe working and hygiene.

Conclusion

Thanks to OptiDam™ there is no excuse for carrying out treatment without the advantages of absolute dryness. It is easy and efficient to use and saves treatment time because there is no need for continuous changing of dental cotton rolls and patients do not have to rinse out so often. Patient comfort is drastically increased because filling residues or other materials or irrigation fluids are kept in check. Step into a new world of dental medicine, by watching the educational video, you will see how easy it can be to have absolute dryness. Save yourself and your team a lot of stress and uncertainty and it won't just be your patients who will appreciate convenience.

Literature

Whitworth JM, Seccombe GV, Shoker K, Steele JG. Use of rubber dam and irrigant selection in UK general dental practice. *International Endodontic Journal*, 33 , 435-441, 2000.

Liebenberg WH. Extending the use of rubber dam isolation: alternative procedures—part II. *Quintessence Int* 1993;24(1):7–17.

Ahlers MO. *Quintessence Int*. 2003 Mar;34(3):203-10.

R. Schluckebier. *Journal of Orofacial Orthopedics/Fortschritte der Kieferorthopädie* Volume 39, Number 5 / September 1978.

Lynch, C. D. , McConnell, R. J. Attitudes and use of rubber dam by Irish general dental practitioners. *International Endodontic Journal*. 40(6):427-432, June 2007.

Kakehashi S, Stanley H R, Fitzgerald R J. The effects of surgical exposures of dental pulps in germ-free and conventional laboratory rats. *Oral Surg Oral Med Oral Path* 1965. 20: 340-344.

Sjögren U, Figdor D, Persson S, Sundqvist G. Influence of infection at the time of root filling on the outcome of endodontic treatment of teeth with apical periodontitis. *Int Endod J* 1997; 30: 297-306.

Gergely E J. Rubber dam acceptance. *Br Dent J* 1989; 167: 249-252.

DGZMK. Good clinical practice: Treatment of the Root Canal.