



Calin Pop, DDS



# RUBBER DAM FIRST

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## Abstract

Restorative dentistry has no better way to reveal its artistry than against the backdrop of the rubber dam. But at a time when enhancing beauty and the dramatic improvements shown in before-and-after images have become paramount to patients, it can be easy to forget the most important role of the rubber dam: It serves as the first line of defense against infection. This article addresses the importance of maximizing the time spent working with rubber dam isolation so that the working time without such isolation is significantly reduced and as efficient as possible.

**Key Words:** rubber dam, restorative dentistry, infection prevention, dental ergonomics, ethics in dentistry

## Introduction

Airborne contamination is minimal and saliva and blood are eliminated from the equation if a procedure is performed under rubber dam isolation.<sup>1</sup> The only possible remaining source for airborne contamination is from any organisms within the tooth that is undergoing treatment.<sup>2</sup>

Likewise, high-volume evacuators (HVEs) have been shown to significantly reduce contamination arising from the operative site.<sup>3</sup> However, from a practical point of view, the suction is more efficient if it is applied in a controlled, well-delimited area focused only on a few teeth that are exposed to receive the treatment.



**Figures 1-7: Manipulation of the rubber dam to create more space around the working area.**





**Figure 8:**  
Keeping the  
patient shielded  
from materials.

### Rubber Dam Isolation Protocol

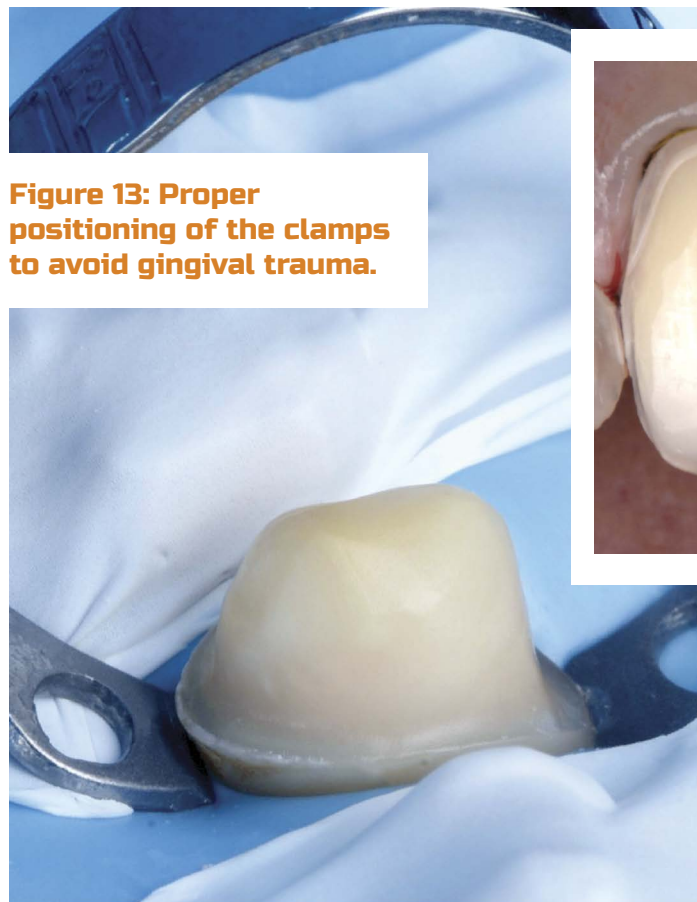
A rubber dam can be manipulated to provide space around the teeth, enabling the dentist to prepare the tooth surfaces, clean excess cement, and polish, with the cheeks, tongue, lips, and gingiva retracted and protected (Figs 1-8). Additionally, the patient is shielded from the accidental inhalation of resultant material when removing old fillings and drilling caries.

As the margins of preparations often are placed subgingivally (Figs 9-11), there are two options to see these margins and evaluate the fit of the restorations or to properly layer and adapt composites: a rubber dam or a retraction cord (Fig 12). If properly selected and positioned, clamps can cause less tissue trauma than retraction cords (Fig 13). Retraction cords also can be more time consuming to place and can cause more bleeding, which may be hard to control, than the rubber dam (Fig 14).



**Figures 9-12:** Margins placed subgingivally can be exposed only with the use of rubber dam or retraction cords.





**Figure 13: Proper positioning of the clamps to avoid gingival trauma.**



**Figure 14: Gingival bleeding caused by retraction cords.**

## Rubber dam or retraction cords?

The rubber dam should be placed before doing anything else (Figs 15 & 16). Only after the dam is placed should we proceed to removing the old restorations (Fig 17). Although the handpiece is the main source of aerosol formation,<sup>4</sup> with rubber dam isolation, aerosol formation from saliva and blood does not occur (Fig 18).

HVEs will function at maximum capacity in a well-delimited area focusing on a reduced number of teeth and without tongue, cheeks, and cotton rolls blocking the tube's absorbent surface. The ground amalgam goes on the rubber dam, not in the patient's mouth or throat. The clinician thus has direct access to areas that might be difficult to visualize without rubber dam isolation.

The gingival tissue is retracted, and deep margins are available for cleaning and proper preparation. In most cases, and especially when removing old overhanging Class II restorations, bleeding from the gums is hard to control.<sup>5</sup> One of the greatest advantages of working with a dental dam is that not only is the gingival bleeding isolated from the treatment area by the dam, but we also are able to proceed with immediate dentin sealing (IDS)<sup>6</sup> under more optimal conditions (Fig 18).

Once the rubber dam isolation protocol is mastered, it provides a method that can be employed in any procedure. The rubber dam is placed in the same way for the delivery appointment, and everything is bonded under proper isolation (Figs 19-21). The protocol is predictable and can be replicated in all anterior or posterior restorative scenarios.



**Figures 15-21: Every step under rubber dam isolation, from preparation to delivery.**

## Case Examples

### Anterior

Some clinicians might approach the case shown in **Figures 22 through 39** in a more exploratory fashion, starting with crown preparation of the four anteriors and seeing what remains after preparation. However, when we rely on prior experience, we can easily anticipate that we will need to replace the old restorations and potentially even place posts and buildups.

In the author's opinion, rather than rushing to prepare whatever we find and take the impression, it is more ethical to instead take sufficient time with details such as replacing the old composite restorations. When we take the time to do these things, we may find overhanging fillings with recurrent decay that are improperly bonded and unreliable as support for new crowns. While some dentists may say that it is not important because bonding to dentin is unreliable anyway, a properly bonded new composite is certainly better than an old restoration that has microleakage or caries, and these faulty restorations will usually detach just from the vibration of the bur.<sup>7</sup>

There are some situations in which the rubber dam cannot be placed first, such as when bridges must be removed. When we cannot start with absolute isolation, a convenient solution is open rubber dam (**Fig 23**), at least for the initial phase of the preparation. However, the advantage of placing the rubber dam properly before the preparation is that the convexity of the nonprepared teeth will aid us in inserting, gliding, inverting, and stabilizing the dam in the sulci with the help of floss ligature (**Fig 24**). It is very difficult to do this once teeth are prepared unless we use clamps.

Once isolation and protection from blood and saliva are achieved, we have the ideal conditions for adhesion in any restorative scenario and can start the preparation (**Fig 25**). In order to properly evaluate the remaining tooth structure, it is necessary to perform the initial preparation and remove the old restorations (**Fig 26**). We can then observe the remaining tooth structure (**Fig 26**) and determine whether post-and-core reinforcement is needed (**Figs 27 & 28**).<sup>8</sup> With the rubber dam on, we can continue the initial preparation (**Fig 29**). The time spent working without rubber dam isolation is decreased as much as possible and limited to refining the margins, providing occlusal clearance, and taking impressions (**Fig 30**). Afterward, rubber dam isolation is again achieved to properly reveal the prepared margins for a textbook delivery/adhesive protocol (**Figs 31-39**).



**Figure 22: It was decided to replace the old composites and reinforce with posts and buildups as a reliable support for the new crowns.**



**Figure 23: Open dam is an option when absolute isolation is not possible.**

**Start the  
preparation or  
place the rubber  
dam first?**



**Figures 24-28:**  
Buildups and posts  
under isolation.



**Figure 29:** Crown  
preparation with  
rubber dam.

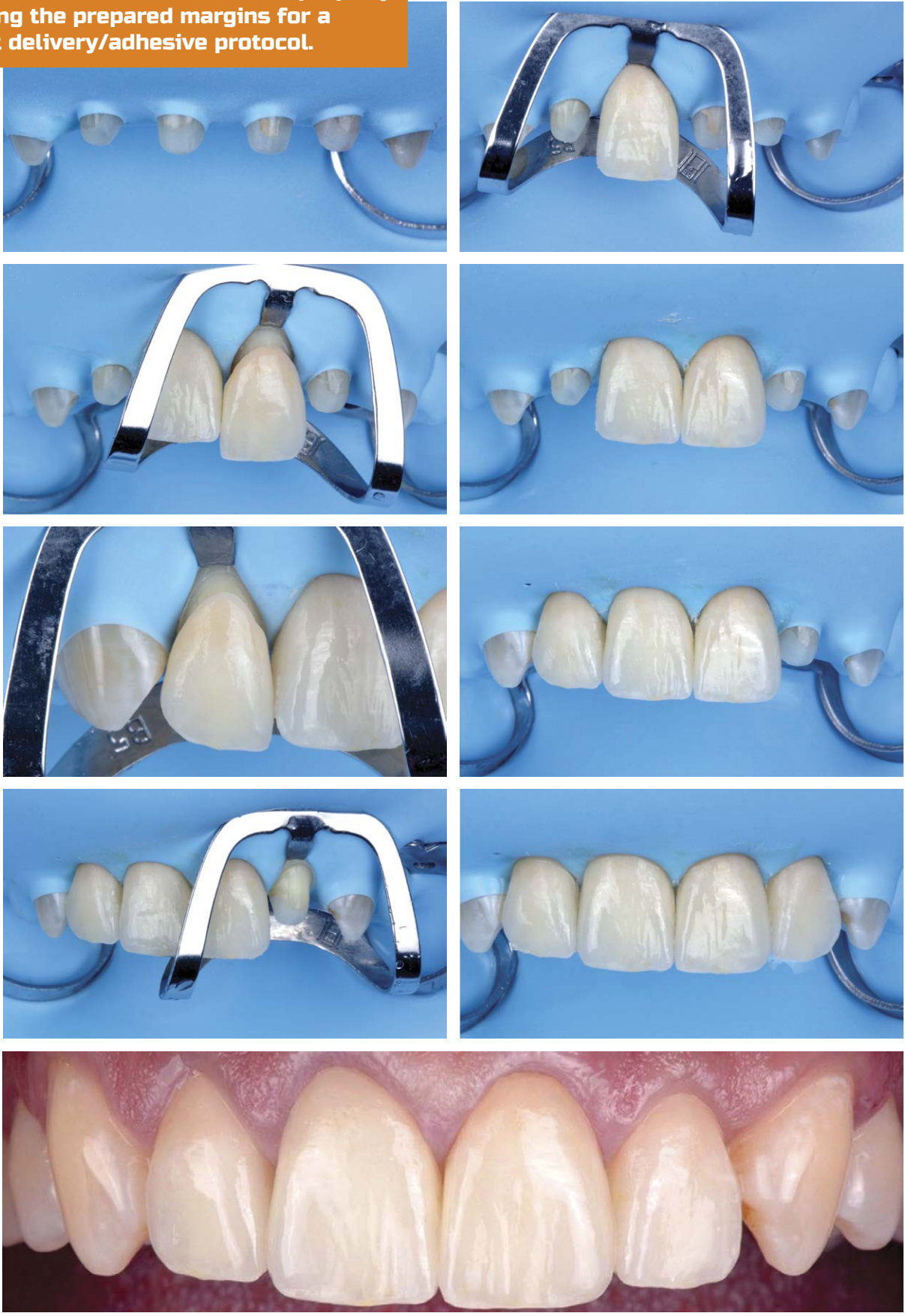


**Figure 30:** Impression and occlusal clearance without rubber dam.



# COVER FEATURE

**Figures 31-39: Absolute isolation, properly revealing the prepared margins for a perfect delivery/adhesive protocol.**



### Posterior

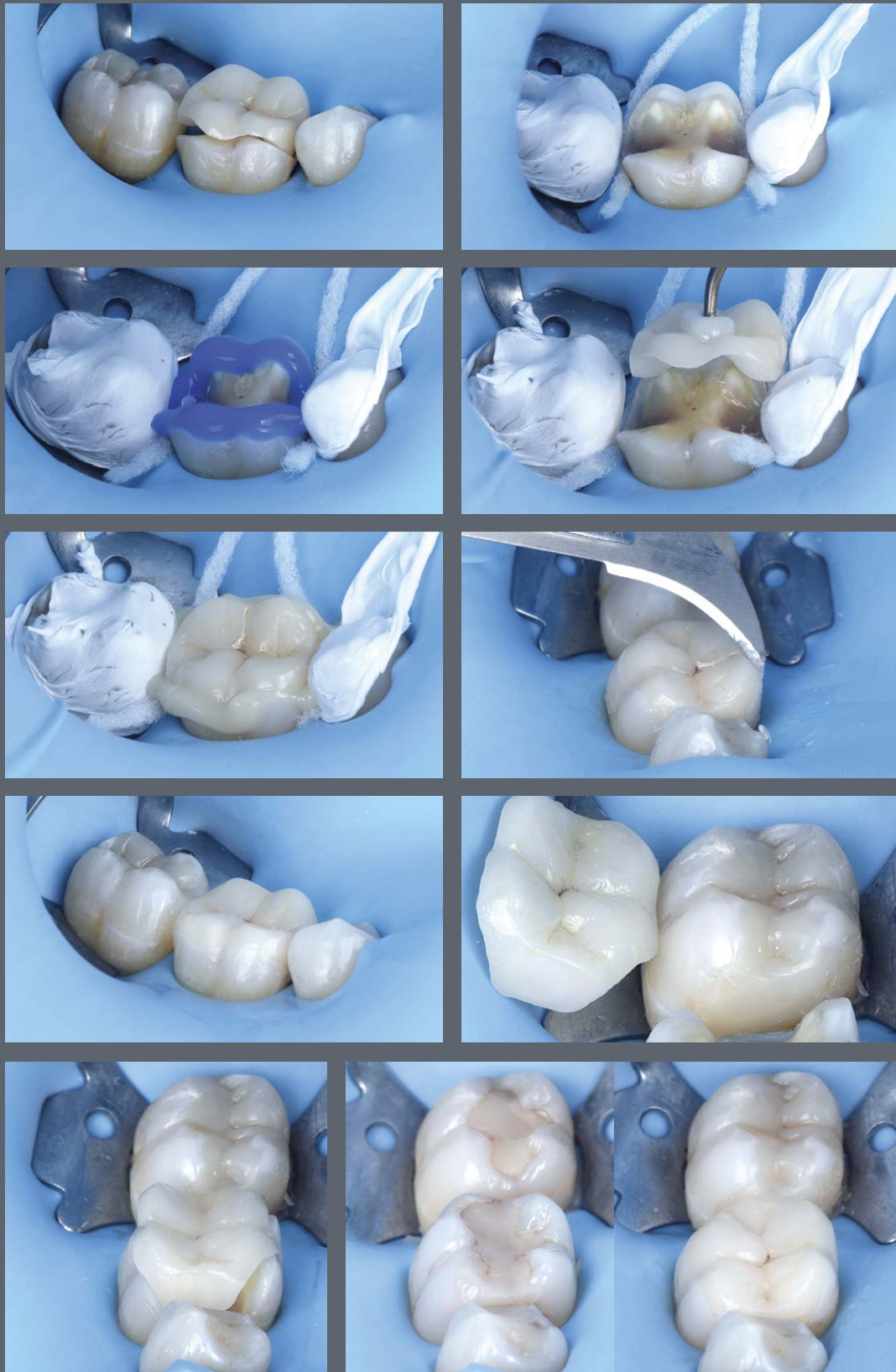
The rubber dam must be placed before any treatment is initiated. If we remove the fillings before, the gums will bleed, and it will be difficult to pass the rubber dam over the margins, especially if the margins are deep. In quadrant dentistry, all direct restorations within a quadrant are done in the first session, as are the preparation and IDS for the indirect restorations (Figs 40-45). To maximize our time spent with the protection provided by the rubber dam, we also can use 3D scanners without removing the rubber dam to determine the clearance necessary for the thickness of the future ceramic restorations using the scanner software's preparation analysis feature.

The same isolation method is followed during the delivery appointment for a flawless adhesive protocol. Removing excess cement and polishing are done with the rubber dam on, again to maximize the time spent protected from saliva and blood (Figs 46-55). It is at this point—when we hold in our hands a piece of porcelain that we then can bond onto the prepared tooth (Fig 56)—that we can see and begin to feel rewarded by the beautiful creation of our responsible dentistry.

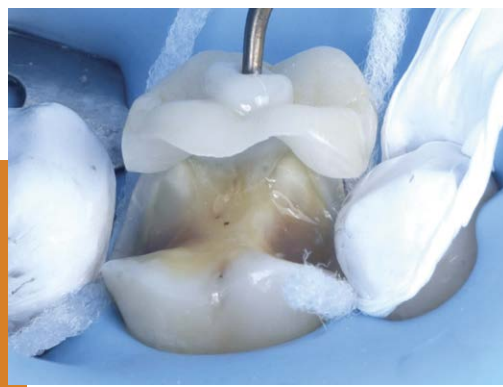


**Figures 40-45:** This posterior case demonstrates the ergonomic benefits of quadrant dentistry.

# COVER FEATURE



**Figures 46-55: Direct and indirect restorations within a quadrant are all performed in the same isolation setup from start to finish.**



**Figure 56: Preparation awaiting the clinician's final artistry.**

## Summary

The use of rubber dam isolation and HVEs is a precaution that should always be followed during dental procedures, even when we are not in the midst of a global pandemic. Certain protocols can be followed to make the most of the time spent with rubber dam isolation for the greatest protection.<sup>9</sup> In addition, from a business perspective, patients will have more confidence and trust in a dentist who employs all available protocols to maximize infection prevention. World events today should serve as a wake-up call for us to practice more responsible dentistry.

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**The use of rubber dam isolation and HVEs is a precaution that should always be followed during dental procedures, even when we are not in the midst of a global pandemic. ”**



Dr. Pop is in private practice in Abu Dhabi, United Arab Emirates.

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