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Alternative Rubber Dam Isolation Technique for the Restoration of Class V Cervical Lesions

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Clinical Relevance

This isolation technique is a time-saving dental rubber dam placement alternative for the restorative treatment of Class V cervical lesions.

SUMMARY

This article describes an expedited, atraumatic technique of restoring cervical abrasion-erosion, abfraction or carious lesions using an alternative placement sequence of the dental rubber dam for adequate field isolation. As shown by this technique, the rubber dam retainer is modified and positioned on the tooth with subsequent placement of the dental dam material over the retainer and tooth. This technique saves time and provides good retraction of the gingival tissue and isolation of the cavity preparation from contamination (saliva, hemorrhage) that can potentially cause post-operative symptoms and possible restoration replacement.

INTRODUCTION

The etiology of Class V cervical lesions are varied, ranging from occlusal factors, brushing habits, dietary regimens and psychological manifestations. Diagnosis of these lesions includes abrasion caused from incorrect brushing techniques, erosion from improper dietary or chemical occupational exposure, abfraction through malocclusion and caries caused by dissolution of tooth structure from bacterial by-products (Vanderwalle & Vigil, 1997). Often, the etiology is multifactoral, making diagnosis and thus effective treatment challenging (Grippo, Simring & Schreiner, 2004). However, restorative care of cervical lesions has increased due to a heightened patient dental awareness and recognition for quality of life.

Isolation of Class V cervical lesions for soft tissue displacement, moisture containment and infection control can require several methods, including rubber dam isolation, minor gingival surgery using radio-surgical laser or scalpel gingivectomy prior to rubber dam retainer placement, cotton roll/saliva ejector isolation, use of clear matrix systems for anatomical contour and perhaps more radical, surgical "flap" or releasing incision procedures and/or crown lengthening prior to restoration insertion.

Reasons specified by dentists for not using the dental rubber dam in restorative practice include the time factor and the contention that a "dry field" can be well maintained without its use (van Dijken & Horstedt,

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1987; Smales, 1993). van Dijken and Horstedt (1987) also demonstrated that application of a rubber dam for restorative procedures did not require longer "chair time." Moisture control through cotton roll isolation often requires increased attention and management by the dental team. Patient objections and unsubstantiated assertions concerning restoration quality are also frequent reasons for inconsistent application. However, inattention by the operator is, perhaps, a more accurate reason for the conservative use of the rubber dam in dental practice.

Cavity preparations should not be restored with the deliberate inclusion of oral fluids, that is, saliva and blood (van Dijken & Horstedt, 1987). Resin composite and adhesive systems are especially technique sensitive, with proper handling and adequate isolation critical for successful restoration and material longevity (Van Meerbeek & others, 2003; Duke, 2003; Leinfelder & Kurdziolek, 2003). Material sensitivity and reaction to the oral environment are important considerations that must be considered prior to choosing a restorative technique.

The technique described in this article provides an effective and time-saving alternative rubber dam armamentarium placement sequence for insertion of Class V cervical restorations. This technique can be used in conjunction with minor gingival surgery (radio-surgery) and/or use of clear, semi-rigid matrix forms for expedited anatomical marginal finishing. Using this technique requires a short learning curve; however, following a few applications, the practitioner or dental assistant will assume increased confidence in usage.

CLINICAL TECHNIQUE

1. The Class V cervical lesion is identified. Treatment options and materials are discussed with the patient (Figure 1).
2. If using an esthetic, an appropriate shade of tooth colored restorative material is determined prior to anesthesia and isolation.
3. Field isolation using the dental rubber dam is discussed with the patient (material sensitivity and infection control concerns) prior to application.
4. The patient is anesthetized, and a choice of rubber dam material (gauge or thickness) is selected for either anterior or posterior use. Several overlapping holes are punched in the dam material for ease of application (Figure 2). Consecutive holes for adjacent teeth are unnecessary using this technique. Prior to placement, a #212 (Hygenic, Coltene/Whaledent Inc, Mahwah, NJ, USA) rubber dam retainer is modified using flat beak orthodontic forceps for adequate retraction of facial gingival tissues (Figures 3A and 3B).

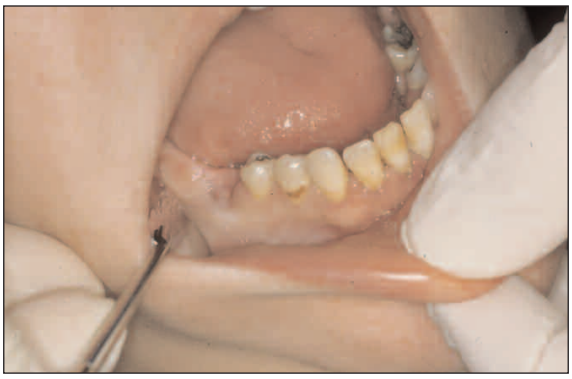

Figure 1. *Pre-treatment clinical photograph of Class V carious lesion, mandibular right first premolar (#28).*

Figure 2. *Overlapping holes (large) are punched in the rubber dam to prevent tearing of the material upon stretching over the retainer.*

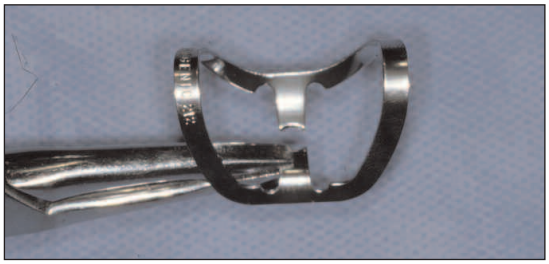

Figure 3A. *Modification of the #212 rubber dam retainer. Note the apical positioning of the facial retainer jaw for increased stabilization and soft tissue retraction.*

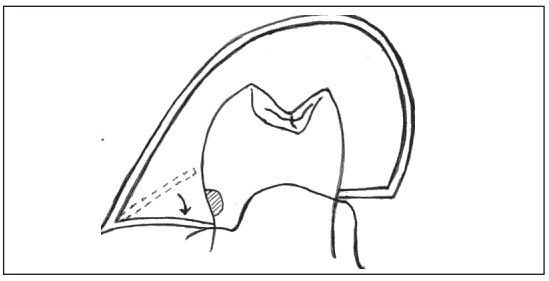

Figure 3B. *Illustration showing altered position of the facial retainer jaw for correct placement on the tooth.*

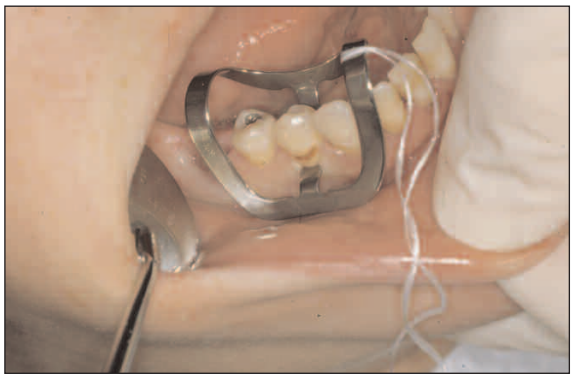

Figure 4. *Correct positioning of the #212 ligated retainer apical to the cavity lesion prior to application of the dental dam material.*

Figure 5. *Completed Class V cavity preparation #28. Note the effective isolation (no need for isolation of adjacent teeth due to location and extent of lesion) prior to insertion of the resin composite restorative.*

Figure 6. *Post-operative view of the resin composite following finishing and polishing procedures. Note the atraumatic condition of the gingival tissue.*

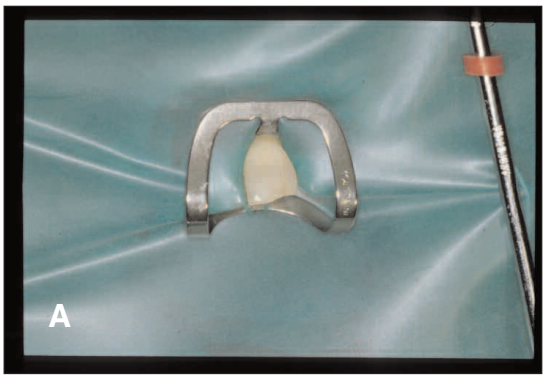

Figure 7A and B. */solation of tooth #9 with #212 ligated retainer/rubber dam and completed resin composite restorations #9 and #10.*

5. Careful positioning of the #212 retainer (ligated with dental floss) on the tooth, with the facial jaw slightly apical to the gingival margin of the lesion, is critical. Extensive caries may necessitate applying firm pressure, carefully retracting the gingival tissues with the retainer jaw. The rubber dam forcep is released, making sure the retainer jaws are positioned soundly on the tooth structure (4-point contact) and not positioned on the facial or lingual gingival tissues (Figure 4). Following retainer placement, the dam material is carefully stretched over the retainer, releasing the patient's lip. The dam material is maneuvered so that only the treatment tooth/lesion is visible, fully isolating the adjacent teeth from view. The rubber dam frame is then placed on the dam. As heated stick compound is not used for retainer stabilization, minor adjustments (if required) of the retainer can be performed.
6. With adequate rubber dam isolation, cavity preparation (caries excavation can be verified using caries disclosing dye) is completed (Figure 5). Following preparation, a fluoride releasing glass ionomer cavity liner can be placed on the axial wall prior to placement of the restorative material.
7. The restorative material (resin composite) is inserted and light polymerized per the manufacturer's instructions. The margins are trimmed to proper functioning anatomy and contour using a #12 scalpel blade. Additional finishing procedures are performed using 30 fluted carbide-finishing burs in a high-speed air/water handpiece, followed by polishing using aluminum oxide

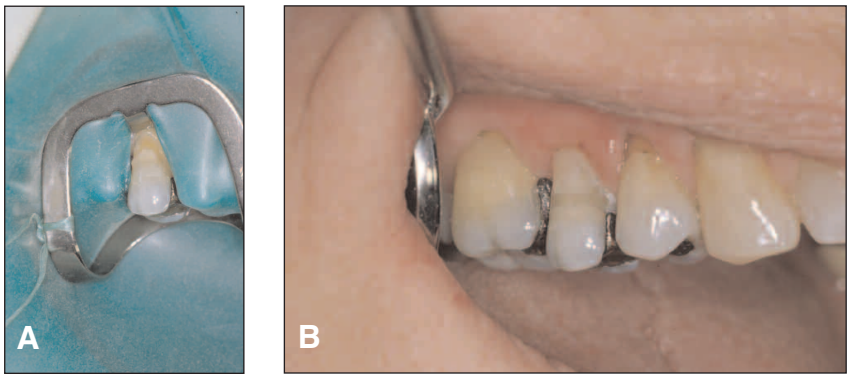

Figure 8A and B. *Retainer placement, rubber dam application and insertion of resin reinforced glass ionomer restoration #4 with the aid of a clear cervical matrix.*

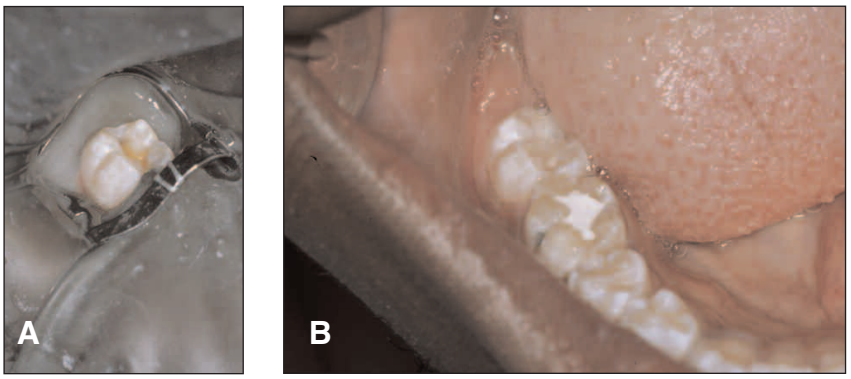

Figure 9A and B. *Single tooth isolation of #31 using a #9 retainer (anterior). This retainer selection is a good alternative for partially erupted mandibular second or third molars in which a posterior retainer is unstable and, thus, ineffective. Note the subsequent rubber dam application and occlusal resin composite insertion.*

points instead of disks, ensuring non-lacerated gingival tissue. A restoration surface sealant can also be applied prior to removal of the rubber dam.

8. The retainer and dam material are carefully removed, with any additional refinements of the contour and/or margins performed with finishing burs and/or aluminum oxide polishing points. The margins are then verified with a dental explorer. The dentist and patient (Figure 6) examine the completed composite restoration.
9. Post-treatment patient instructions include gentle massage of the gingival tissues and reinforcement of the oral hygiene protocol.

This technique is ideal for treating one or more Class V cervical lesions in the anterior or posterior dentition (Figures 7A, B and 8A, B) and for restoration of Class I lesions with respective restorative material (Figures 9A, B). If additional surfaces on the same tooth are involved, additional holes must be punched in the dam material to allow for adequate adjacent contacts to be maintained. If more than one Class V lesion is identified (adjacent teeth), the dam material and retainer can be quickly removed and repositioned on another tooth for Class V restoration placement.

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References

Duke ES (2003) The science and practice of dental adhesive systems *Compendium* **24(6)** 417-419, 421, 423-424.

Grippo JO, Simring M & Schreiner S (2004) Attrition, abrasion, corrosion and abfraction revisited *Journal of the American Dental Association* **135(8)** 1109-1118.

Leinfelder KF & Kurdziolek (2003) Self-etching bonding agents *Compendium* **24(6)** 447-454, 456.

Smales RJ (1993) Rubber dam usage related to restoration quality and survival *British Dental Journal* **174(9)** 330-333.

Vandewalle KS & Vigil G (1997) Guidelines for the restoration of Class V lesions *General Dentistry* **45(3)** 254-260.

van Dijken JW & Horstedt P (1987) Effect of the use of rubber dam versus cotton rolls on marginal adaptation of composite resin fillings to acid-etched *Acta Odontologic Scandinavia* **45(5)** 303-308.

Van Meerbeek B, De Munck J, Yoshida Y, Inoue S, Vargas M, Vijay P, Van Landuyt K, Lambrechts P & Vanherle G (2003) Buonocore Memorial Lecture. Adhesion to enamel and dentin: Current status and future challenges *Operative Dentistry* **28(3)** 215-235.