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GIC restoration of cervically abraded teeth

Danish Prabhakar

PG student (1st Year), Department of Conservative Dentistry & Endodontics, Desh Bhagat Dental College & Hospital, Mandi Gobindgarh

Email: prabhakardanish0@gmail.com

Udit Gupta

PG student (2nd Year), Department of Conservative Dentistry & Endodontics, Desh Bhagat Dental College & Hospital, Mandi Gobindgarh

Sunil Malhan

HOD, Department of Conservative Dentistry & Endodontics, Desh Bhagat Dental College & Hospital, Mandi Gobindgarh

Abstract--In current times, dental abrasion has become a common pathologic condition. It is most commonly seen at the cervical necks of teeth, but can occur in any area, even inter-dentally from vigorous and incorrect use of dental floss. Clinically, at the beginning it is small horizontal groove near the cemento-enamel junction; However, then the walls form a wedge with polished, glassy surfaces and tactile sensitivity. The treatment approach for cervical abrasion must not be based only on restorative procedures since a variety of causative and aggravating factors are related to their formation. The current article discusses a treatment protocol and techniques for the restoration of non-carious Class V lesions and presents a clinical case in which restoration is achieved with the conventional Glass Ionomer Cement.

Keywords--dental abrasion, dental floss, restoration.

Introduction

Glass ionomer based materials are clinically popular in several areas of restorative dentistry, but restoration of cervical lesions has proven particularly successful. Composite resin and glass ionomer cements (GICs) have been indicated as the restorative materials of choice for these cases.^{1,2} GICs, however, have a wider range of clinical applications in non-carious cervical lesions. These materials are capable to form satisfactory bonds with enamel and dentin, release fluoride over a prolonged period, promote good biological response (biocompatibility).^{3,4} Noncarious cervical lesions present a significant dental

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Corresponding author: Prabhakar, D.; Email: prabhakardanish0@gmail.com

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health problem. It is wellrecognized that noncarious cervical lesions may be caused by toothbrushing abrasion.⁵ In the past few years, it was hypothesized that the etiologic factor of these wedge-shaped defects was tooth flexure resulting from tensile stress.⁶

Cervical areas are morphologically and histologically different from the crown and the root portions of the tooth. Mechanical interlocking between enamel and dentin in the cervical area is weaker than that in the other regions of the dentinenamel junction.⁷ These structural features may adversely affect the performance of the restorative materials used in the cervical area. Glass ionomer cements (GICs) are formed by an acid-base reaction of an aqueous polymeric acid and an ion-leachable glass.⁸ Since these cements bond chemically to enamel and dentin and release fluoride over long periods, they have been considered among the materials used in the restoration of cervical lesions.⁹

Case Report

A 35-year-old female patient reported to the Department of Conservative Dentistry and Endodontics of the Desh Bhagat Dental College & Hospital, Mandi Gobindgarh with multiple noncarious cervical lesions in both the arches. Patients's History was taken and Clinical examination was performed to determine any potential etiologic factors, focusing on the multifactorial character usually associated with the formation and progression of this type of lesion. During History Taking, the patient reported habits of grinding and clenching, exaggerated toothbrushing, which are the key factors for lesion formation and progression.

The patient was explained about the treatment of GIC restoration of the teeth and informed consent was taken. Preoperative photographs were taken showing multiple cervical abrasions. (Fig. 1) & (Fig. 2). The first stage of treatment was based on counseling. The patient was advised on the role of parafunctional habits, excessive ingestion of acidic drinks, and exaggerated toothbrushing in the etiology of noncarious cervical lesions. The patient was advised of the need for habit control and an occlusal splint for dental protection, and was asked to reduce the ingestion of acidic substances and the intensity of toothbrushing.



Figure 1.



Figure 2.

Figure 1 & 2. Showing Cervical Abrasions on both side of the arches

In the second stage of the treatment, the teeth were prepared to receive the restorative material. No extensive cavity preparation was needed as there was no previous faulty restoration present. Type II Restorative Glass Ionomer Cement was decided as the restorative material for the patient. After preparing all the teeth, each arch was isolated with cotton pellets respectively to prevent contamination from saliva. The surface of each tooth was dried with the help of three way syringe to receive the restorative material. The Glass Ionomer Cement was then mixed with the agate spatula over a plastic mixing pad and then placed into the prepared cavities. Significant results were obtained which are shown as follows(Figure 3 & 4).



Figure 3.



Figure 4.

Figure 3 & 4 showing teeth after restoration with GIC

Discussion

Restoring the dental aesthetics has been considered one of the chief purposes of modern dental medicine. Novel materials and treatment methods are being developed every day to reach this goal.¹⁰ Owing to the lack of inherent macromechanical retention in restorations of noncarious cervical lesions, adhesion is the most important factor in retention of such restorations.¹¹ However, the retention is affected by various factors such as tooth flexure, occlusal stress, the character of the dentinal surface and elastic modulus of the restorative materials.

Some laboratory studies have shown that the sandwich technique could be advantageous if compared to the composite or GIC restorations alone, especially when the gingival margins of the restorations are examined.^{12,13} A possible explanation for this is that the base transmits flexure forces to the whole restoration. Another theory states that GIC could be recommended in that there is high amount of calcium ions available in this sclerotic dentin. Furthermore, the replacement of dentin and enamel by GIC and composite resin, respectively lowers the composite polymerization shrinkage, allows the release of fluoride ions and makes it possible to achieve a more polished surface of the restoration. The possible disadvantages of this restorative approach include the increase of time, the complexity and the precision required to place these materials.¹⁴

GICs are very durable in cervical restorations and compete with the composites, particularly where bonding to cervical dentin is required. Sclerosed dentin remains the greatest obstacle to obtain good bonding with dentinal bonding agents, and failure at the cervical margin, as a result of microleakage, is not always easily detected.¹⁵ Dijken⁵⁵ (2005), for example, showed that removal of the outer surface layer of the sclerotic dentin by roughening with a diamond bur did not improve retention for RMGICs, as shown in earlier published studies.^{16,17}

Conclusion

The treatment of non-carious Class V lesions can either be limited to the elimination of the causative factors and regular monitoring, or it may involve restorative procedures. Identification of the risk factors is clearly important in order to modify any habits and provide appropriate advice. The article aims to highlight GIC as a restorative material for the cervical abrasions. However, the choice of restorative material depends on the conditions favorable according to the dentist and also the esthetic requirements of the patient.

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