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# Modified techniques for restoring non-carious cervical lesions – A case report

[1]P. Karunakar, Professor and head of the department, Department of Conservative dentistry and Endodontics, Panineeya Institute of Dental Sciences and Research Centre, Hyderabad, Telangana, India.

[2]M.S. Rangareddy, Professor, Department of Conservative dentistry and Endodontics, Panineeya Institute of Dental Sciences and Research Centre, Hyderabad, Telangana, India.

[3]Umrana Faizuddin, Professor, Department of Conservative dentistry and Endodontics, Panineeya Institute of Dental Sciences and Research Centre, Hyderabad, Telangana, India.

[4]Basa Srinivas Karteek, Reader, Department of Conservative dentistry and Endodontics, Panineeya Institute of Dental Sciences and Research Centre, Hyderabad, Telangana, India.

[5]Chigurupati Swetha, Post Graduate student, Department of Conservative dentistry and Endodontics, Panineeya Institute of Dental Sciences and Research Centre, Hyderabad, Telangana, India.

**Corresponding Author:** Chigurupati Swetha, Post Graduate student, Department of Conservative dentistry and Endodontics, Panineeya Institute of Dental Sciences and Research Centre, Hyderabad, Telangana, India.

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## Abstract

Noncarious cervical lesions are most prevalent and may have different etiologies. Restoring these lesions can pose clinical challenges, including isolation, adhesion, and insertion technique, finishing and polishing. This case report highlights two different clinical techniques that help to overcome many of the above mentioned difficulties in restoring the non-carious cervical lesions.

**Keywords:** Non-Carious Cervical Lesions (NCCL's), Modified matrix technique, Direct-Indirect technique.

## Introduction

The prevalence of carious lesions follows a trend towards diminishing in a number of population whereas non-carious cervical lesions have been advancing and becoming more common as a restorative procedure[1]. Non-Carious Cervical Lesions (NCCL's) are characterized by the loss of tooth structure at the cemento-enamel junction without being related to an active pathological process of caries[2]. The prevalence of NCCL's has been estimated to vary between 5% and 85% of the population. They are very common in middle-aged and elderly individuals and represent a challenge to the dental profession[3].

The clinical decision making for restorative procedures should be based on vigilant consideration of the etiology and complex morphology of the lesions. When a restorative procedure is selected for NCCL's it is accepted that the aim of the procedure is not to treat the lesion or to correct its underlying etiology, but to restore the structure that has been lost, obliterate the open dentinal tubules, reduce symptoms, if present, and possibly halt the progression of the disease[4].

Unfortunately, NCCLs represent one of the less durable type of restorations and having a high index of loss of retention, marginal excess, and secondary caries[5]. In restoration of the NCCLs the first problem is the subgingival position of the margin, suitable isolation of the operating field which is fundamental for an effective restoration, adhesion to different opposite substrates (enamel and dentin), insufficient finishing of the cervical border which can result in an incongruous restoration, favoring marginal micro-infiltration and the risk of early failure of the restoration[6].

Therefore the aim of this case report is to highlight two different techniques to overcome many of the above mentioned difficulties in restoring the NCCLs.

**Case reports**

**Case report- 1:** A 55 year old male patient came to the department of Conservative Dentistry and Endodontics, Panineeya Dental College and Research Centre, Hyderabad, with a chief complaint of sensitivity in the right lower back tooth region for 2 weeks. Clinical examination revealed cervical abrasion on 44(Figure 1a).

**Modified matrix technique**

For the fabrication of custom matrix, universal Tofflemire No.1 matrix band was trimmed with scissors to a width of 3mm using curvature opposite to that of the band, on that side. Both the ends of the matrix were trimmed by 1.5cm each (Figure 1b). The modified matrix was molded with finger- pressure to form the arch- shaped facial contour of the tooth. Trimmed occlusal portion of the modified matrix band became the gingival side of the custom matrix.

**Restoration**

Isolation was done using gingival retraction cord No.0 (Figure1c), the modified band was placed around the tooth and gingival sulcus, and stabilized with the help of two wooden wedges, on the mesial and distal side of the tooth (Figure1d).After the modified matrix band placement, total – etch technique (N-etch, Ivoclar vivadent) was used (Figure1e). After rinsing and air-drying the bonding agent (Prime & Bond, Dentsply Sirona) was applied and light- curing was done for 30seconds (Figure1f,g). Later flowable composite (Tetric N-flow, Ivoclar vivadent) shade A2, was placed and curing was done for 60seconds (Figure1h). After light curing, the matrix was removed and excess cement was removed using a diamond bur (TF 11) (Figure1i). Finishing and polishing were accomplished with a diamond bur (TR 12) and abrasive cups. The 6-month post follow up showed promising results (Figure 1k)

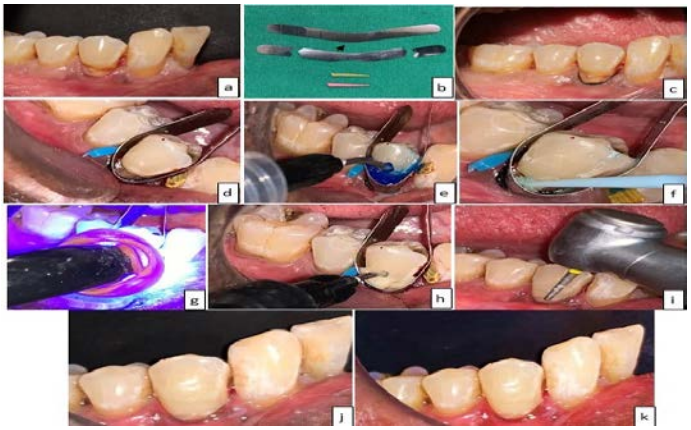

Figure 1**:** Case report 1- Modified matrix technique

a) Pre-clinical image irt 44 b) Modified Tofflemire band c) Isolation d) Matrix band placement e) Etching f) Bonding agent application g) Curing h) Composite

Placement i) Finishing of restoration j) Post-operative image k) 6-month follow-up image.

**Case Report- 2**

A 45 year old female patient came to the department of Conservative Dentistry and Endodontics, Panineeya Dental College and Research Centre, Hyderabad, with a chief complaint of sensitivity in the right lower back tooth region since 1month. The intraoral examination revealed cervical abrasion on 44, 45, and 46(Figure 2a).

Direct – indirect technique

Shade selection of composite was done for restoring NCCL. After shade selection isolation was done with the help of gingival retraction cord No.0 (Figure2b). The selected composite shade (Tetric N-ceram, Ivoclar vivadent) was made into a small ball and pressed onto the cervical lesion which covered the entire lesion and extended beyond its boundaries mainly over the gingival margin (Figure2c). The restoration was light cured for a few seconds, using a probe, the restoration was flicked off and further light-cured extra-orally from it's outer to inner aspect followed by extra-oral finishing of the inlay (Figure2e, g, h). Surface treatment of cervical lesion was done initially by etching (N-etch, Ivoclar vivadent), followed by application of bonding agent and curing (Figure 2 i, j, k). Cementation of inlay was done with the help of flowable composite (Tetric N-flow, Ivoclar vivadent) spot cured for 1-3 second (Figure 2 l, m, n) and excess cement was removed with help of an explorer. 6-months follow-up showed acceptable results (Figure p).

Figure 2: Case report 2- Direct-indirect technique

a) Pre-operative image b) Isolation c) composite placement d) curing e) Inlay removal f) Inlay g) Extra-oral curing h)Finishing of Inlay i) Etching j) Bonding agent application k) Curing l,m,n) Cementation of Inlay o) Post-operative Image p) 6-month follow-up image

**Discussion**

The loss of dental structure in NCCLs involves not only bone loss and gingival recession but also complete change in the biomechanics of the dental components affected by the pathology.[7] According to Grippo et al the restoration is must for NCCLs due to following reasons: flexure and progress of the abfractions; decreases stress concentration; cervical hypersensitivity; enhances gingival health by providing food deflection; prevents pulpal involvement and tooth fracture; strengthen the tooth structure ; eliminates acid dissolution and stress corrosion; eases oral hygiene maintenance and improves esthetics.[8]

Isolation of NCCL's 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, surgical "flap" or releasing incision procedures and/or crown lengthening prior to restoration insertion. These techniques are cumbersome and cause trauma to the adjacent tissues.[9]

Additional problem arising in restoring these lesions are finishing is limited, flash and overhangs, rough gingival margins and nicking the cementum as a result of poor access to and instrumentation of the margins.

The use of modified matrix band provides local isolation, displaces gingiva in a non- traumatic way and allows clear access to entire cavity, including cervical margin[10]. It helps in confinement of restorative material to the matrix band, leading to minimal overhangs and proper interproximal contours thereby minimal finishing is required[11, 12]. But using the following technique is difficult in the absence of adjacent teeth, as stabilizing the matrix with wooden wedges can be challenging in such situations.

MG Brackett et al used modified matrix technique in combination with resin modified glass ionomer cement in restoring class V and seen best results after a 2 year follow-up period.[12] The only disadvantage was the shade matching of the restoration was not possible. In the present case report we have used composite material to overcome this problem.

Direct indirect technique of restoring non-carious lesions is one in which the composite resin is directly applied and sculpted onto tooth surface prior to acid etching and adhesive application. The benefit of this technique is it helps to access the difficult areas like molars because of tooth position relative to soft and hard tissues, reduce stress caused by polymerization shrinkage on tooth, extra-oral finishing and polishing of the restoration, patient comfort because of minimal intraoral working time, which reduces mouth opening time for patients, allowing them to rest between restorative steps[13].

Haller et al investigated in-vitro marginal seal of cervical composite inlays in comparison with conventional Class V restorations, the results showed better performance of the inlays regarding micro-leakage because of additional light- curing which made the bonded inlays more resistant to thermal stress and enhanced bond stability[14].

Composite resin with a dentine bonding agent, is one of the options for the restoration of the NCCL's. It has the advantage of being a simple technique, with excellent aesthetics and a highly polished surface. Studies have suggested that use of micro-filled resin composite or a flowable resin that has a low modulus of elasticity, as it will flex with the tooth and not compromise retention by accommodating the change in cavity shape[15]. In the present case report both micro filled composite and flowable composite were used and showed acceptable results.

**Conclusion**

The stability and longevity of resin restorations in NCCL's depend on etiological factors and risk factors and also technique and adhesive material used for clinical performance. One of the challenges for the practitioner is isolation of these lesions during restorative procedure. The use of modified matrix and direct indirect techniques presented in this article for restoring NCCL's endow precise margin finishing and polishing, and overcoming challenges associated with field control, composite handling and maintaining periodontal health

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