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## Review Article

# Need for restoration of non-carious cervical lesions – A literature review

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### ABSTRACT

In present scenario, restoring non-carious cervical lesions (NCCLs) is clinically common. Major reasons for this are increased elderly population, the decreasing levels of tooth loss, and possible increase in the etiologies. These factors are poor brushing technique due to which gums recede, consumption of corrosive foods and beverages, and occlusal stress concentrators (occlusal disorders, premature contact, clenching, and bruxism habits. Unfortunately, Class V restorations are known to be less durable type and they have high index of retention loss, marginal residues and secondary caries. Other problems include isolation, insertion, cutting, finishing, and polishing. The present work aims to help the dentist choose best treatment strategy, which mainly involves the stages of problem identification, diagnosis, elimination or etiological treatment and if require restoration. Finally, appropriate recovery methods are suggested for each situation.

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## 1. Introduction

While considering the long-term health of the teeth, Non-carious Cervical Lesions (NCCLs) are an important factor. There is steady increase in the occurrence of these lesions. It is a multifactorial condition.<sup>1</sup> They affects tooth sensitivity, plaque retention, structural integrity, pulp vitality and caries incidence. For retaining the teeth longer, increased dental awareness and treatment will help. Other factors include bruxism/ parafunctional habits and dietary and oral hygiene habits. They are usually seen at the cervical region of the teeth at the CEJ, especially in older adults.<sup>2</sup>

### 1.1. Predisposing factors

1. Brittle dentin & dentine.
2. Gingival recession.
3. Exposed root surfaces.

Clinically they are present as shallow to deep and huge wedge-shaped defects initially restricted to the enamel and slowly progressing into the dentin and subsequent dentinal sclerosis. To note minor changes in the surface of the teeth, they should be thoroughly dried and well illuminated.<sup>3</sup>

### 1.2. Advantages of restoring NCCLs

1. Relief from dentinal hypersensitivity.
2. Correct periodontal esthetic damage.
3. Reinforce the tooth structure to prevent tooth fracture.
4. To restore tooth form and function.<sup>4</sup>

For a proper diagnosis and treatment plan, there is need of

1. Keen observation,
2. A thorough patient history, and
3. Careful evaluation.<sup>5</sup>

In the decision making regarding restorative therapy and the technique used, pain is one of the major factors. After eliminating dental caries as primary cause, the

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**Table 1:**

Condition	Patient complaint
Painless and doesn't affect esthetics	No complaint from patient.
Not completely painless, but the dentin is partially (or completely) covered by dental plaque, tartar, or gum. A simple removal (or displacement) of this coverage followed by the application of some stimulus (like a delicate air blast) can indicate pain process. <sup>4</sup>	If pain is present, locating the lesion will be easier.

**Table 2:**

Condition	Description									
Abrasion	Abrasion is the result of friction between a tooth and an exogenous agent. Masticatory abrasion is, if teeth are worn on their occlusal surfaces, incisal surfaces, or both by friction from the food bolus. Abrasion can also occur as a result of a. Overzealous tooth brushing, b. improper use of dental floss and toothpicks, or c. detrimental oral habits.									
Erosion	Erosion is the loss of dental hard tissues by chemical action not involving bacteria. In dentistry, instead of erosion, corrosion is preferred. Corrosion is the tooth surface loss caused by chemical or electrochemical action.									
	<table border="1"> <thead> <tr> <th>Sources</th> <th>Condition</th> <th>Description</th> </tr> </thead> <tbody> <tr> <td>Endogenous sources</td> <td>Bulimia or GERD</td> <td>Enamel appears translucent and thin; enamel is lost on the posterior occlusal and anterior palatal surfaces, and depressions occur at the cervical areas of upper anterior teeth. "Cupped," or invaginated, areas develop where dentin has been exposed on the occlusal surfaces of posterior teeth because of wear.</td> </tr> <tr> <td>Exogenous sources</td> <td></td> <td>The tissue loss location modifies following the areas related to the passage of the corrosive element</td> </tr> </tbody> </table>	Sources	Condition	Description	Endogenous sources	Bulimia or GERD	Enamel appears translucent and thin; enamel is lost on the posterior occlusal and anterior palatal surfaces, and depressions occur at the cervical areas of upper anterior teeth. "Cupped," or invaginated, areas develop where dentin has been exposed on the occlusal surfaces of posterior teeth because of wear.	Exogenous sources		The tissue loss location modifies following the areas related to the passage of the corrosive element
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Abfraction	Abfraction is thought to occur when excessive cyclic non-axial tooth loading results in flexure and stress concentration in the vulnerable cusp region of the tooth. These stresses are believed to contribute directly or indirectly to the loss of cervical dentinal substance. <sup>5-7</sup>									

**Table 3:** Studies related to various materials used for restoration of NCCLs

S.No.	Author, journal, Year	Title	Conclusion
1	Anne-Katrin Lührs, Clinical and Experimental Research, 2020. <sup>6</sup>	Composite restorations placed in non-carious cervical lesions—Which cavity preparation is clinically reliable?	No significant difference found between the groups regarding esthetic appearance, marginal discoloration, marginal adaptation, anatomic form. Composites are stable materials for restoring NCCLs for long periods. Restorations placed without any dentin preparation (cavity cleaning only) showed the highest loss rate.
2	Je-Kang Du, BMC Oral Health, 2020. <sup>7</sup>	Influence of cavity depth and restoration of non-carious cervical root lesions on strain distribution from various loading sites	NCCLs at 1.5 mm depth are found to be detrimental, but they can be restored using composite resin.
3	Isis Morais Bezerra, Heliyon, 2020. <sup>8</sup>	Glass ionomer cements compared with composite resin in restoration of non-carious cervical lesions: A systematic review and meta-analysis	GIC found to show the clinical performance significantly higher than CR in regard to retention, whereas regarding other parameters, GIC was similar to CR.
4	Livia Fávaro ZEOLA, Bio Sci J, 2015. <sup>9</sup>	Influence of non-carious cervical lesions depth, loading point application and restoration on stress distribution pattern in lower premolars: A 2d finite element analysis	The extent of non-carious cervical lesion and loading conditions influenced the stress distribution pattern of lower premolar. The outer load seems to be more critical in affecting the biomechanical behaviour of lower premolars, regardless of the lesion size. The restoration of NCCLs with composite resin appears to recover the biomechanical behaviour, similar to healthy model.
5	K Ayyappan, J Med Sci Clinical Res, 2019. <sup>10</sup>	Comparative evaluation of three different tooth coloured and light cured restorative materials on cervical abrasion lesions- A clinical study	Among the three materials included, the clinical performance of Fuji II LC found to be 100% success in all the properties evaluated. The other two materials also showed 100% success except for marginal adaptation and anatomic form. In these properties the Dyract showed 49% success and composite restoration showed 18.7% success after one year.

other possible factors that might be involved have to be identified.<sup>5</sup>

These non-cariou processes may include abrasion, corrosion, and abfraction, which can occur alone or combined. Factors like age, occlusion, saliva, diet, sex, and parafunctional habits are directly associated with the genesis of NCCL.<sup>5</sup>

It was found that any food substance with a critical pH below 5.5 can be a corrosive agent and demineralize teeth. Consuming foods with high acidity and beverages such as carbonated drinks, citrus fruits, and acidic sweets will be one of the reasons for NCCLs. Mouthwashes with acidic nature may also be involved. Soft drinks with acidity have become an important part of many diets, especially among teenagers and young children. It is clear that, this condition not only affects the cervical region but also works synergistically with other factors.<sup>4,5,7,8</sup>

## 2. Conclusion

The treatment of NCCL is a complex process. The correct choice of restorative material depends on aesthetic needs and maintenance of the polished surface. The correct restorative choice depends on the type of NCCL, cavity preparation and technical needs. Factors that may affect restoration results include dentinal sclerosis, occlusal contacts, bruxism, erosive regimen, dysfunctional habits and restorations present on the affected teeth. Till recent times, GIC was considered a material of choice for most NCCLs. Modern composite restorations provide great aesthetic look, but traditional GICs and RMGICs shows significant improvements in both translucency and color. Table 3

## 3. Source of Funding

None.

## 4. Conflicts of interest

There are no conflicts of interest.

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