

“Root Caries, Diagnosis, Prevention and their treatment”

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Abstract: Root caries was once considered a disease for which the elderly population had their teeth extracted and replaced with removable prosthesis.^[1] Approximately 38% of patients between the ages of 55 and 64 years have root caries, and 47% of those between 65 and 74 years have experienced root caries.^[2] At present, root caries is becoming a new area of focused research in dentistry, as more people are living to an advanced age and retaining their natural teeth.

Keywords: Cementum, elderly, geriatric, root caries, root surface,

Root Caries: Diagnosis, Prevention and their treatment

I. Introduction

Root surface caries is a soft, irregular, progressive lesion occurring at or apical to the CEJ. It is caused by the presence of bacterial plaque and the repeated consumption of sugars, which results in the dissolution of minerals from the calcified tissue.^[3,4] These regions may appear as white or discolored (brown or black) areas of irregular outline, with or without a cavity at an exposed root surface or at the margins of existing restoration.^[5]



Figure 5.54: Clinical picture showing root caries on maxillary lateral incisor and canine

Etiology of the caries

Root caries is initiated when bacteria and fermentable carbohydrates attack the root surface. *Streptococcus mutans* was found to be the primary initiating microorganism.^[6] *Lactobacillus* and *Actinobacillus* are believed to have adjunctive roles.^[7] *Candida albicans* has been identified in soft lesions but is not considered to have a role in initiating these lesions.^[8]

II. Risk Factors

Risk Factors Associated With The High Prevalence Of Root Caries Among Older Adults Include

1. Decreased salivary flow or xerostomia
2. Exposure of root surfaces due to periodontal (Gum) diseases
3. Chronic medical conditions
4. Radiation treatment for head and neck cancer
5. Physical limitations
6. Poor oral hygiene
7. Changes in dietary habits

III. Diagnosis

Clinical examination to assess the presence of root caries is best carried out with an explorer that can detect differences in the surface character (eg. soft or hard) and surface contours.^[10] Teeth surface should be cleaned since plaque covers the lesions and they may be misdiagnosed. Both transillumination and direct vision

should be employed. Accurate radiographs are very important diagnostic tools and should be free from overlapping or burn out.^[11]



Radiographic Appearance of Root caries in a Maxillary Premolar and Mandibular Molar

Prevention

Proper preventive measures of plaque removal, diet modification, and the use of topical fluoride has demonstrated significant results in arresting active carious lesions.^[6,12] Fluoride is an appropriate agent for prevention of root caries because it promotes the remineralization process and reduces the rate of demineralization.^[13,14]

Treatment of Root caries

The treatment provided for patients should depend on classifying them into risk groups. Table 1 shows the patient risk level and treatment options.^[15,16,17]

Table 1. Root caries risk categories, prevention and restorative materials.^{3,9,36}

Risk Level	Oral Hygiene	Root Caries	Preventive Option	Restorative Material
Low	Good	No caries in 3 years	Reinforce prevention, annual recall	No restrictions
Medium	Fair	1-2 lesions in 3 years	Diet counseling, fluoride toothpaste, fluoride mouth rinse, professional fluoride application, 6-month recall	Resin composites, resin-modified glass-ionomers, compomers
High	Normal	More than 2 lesions in past 3 years	Monitor microorganisms, modify diet, fluoride toothpaste, 1.1% neutral sodium fluoride gel daily and chlorhexidine rinse for 2-4 wk, xylitol chewing gum, 3-month recall	Materials that release fluoride



Photograph Showing Root Caries In 33 & 34 Restored With Glass Ionomer Cement

Restorative Materials: There are different restorative materials available. But no one material possesses entirely ideal characteristics. Table 2 lists the restorative materials used for treating root caries.

Direct-filling gold: It was formerly the material of choice for its ability to achieve very close marginal adaptation and its compatibility. However the application of direct-filling gold can be compromised when access is limited and isolation is difficult.

Dental amalgam: It is a material that is easy to manipulate, can be used in areas with difficult isolation or where the margins are self-sealing.^[18] Moreover this material lacks aesthetic appearance, is brittle, has no therapeutic effect and cannot bond to the tooth structure.

Traditional Glass-ionomer cements: They have the desirable properties of being biocompatible, achieving a chemical bond to enamel and dentin and releasing fluoride over extended periods of time. These materials have the disadvantages of poor esthetics and excessive *in vivo* wear with time.

Resin-modified Glass-ionomers: They are indicated for high caries-risk patients.^[19] They are biocompatible, bond to enamel and dentin, possess thermal expansion and contraction characteristics that match tooth structure well and have an anticariogenic effect from the same type of fluoride release characteristic of traditional glass ionomers.

Resin Composites

They are highly esthetic materials, and bond to enamel and dentin. Hybrid composites possess improved strength and improved esthetics compared with traditional resin composite. Microfilled composites can be highly polished to provide a high luster that is similar to enamel and these materials give good results in low stress bearing areas.

Compomers.

They are polyacid-modified resin composites and thus possess properties of both glass-ionomers and resin composites. They leach fluoride, but to a lesser extent than glass ionomers and they bond to both enamel and dentin.

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Table 2. Restorative materials used for root caries lesion

Material	Flouride release	Adhesive	Aesthetics
Amalgam	None	No	Low
Glass ionomer	High	Yes	Moderate
Resin- modified glass ionomer	High	Yes	Moderately high
Resin composite	None	Yes, with bonding	High
Flouride-containing resin composite	Little	Yes, with bonding	High
Compomer	Moderate	Yes, with bonding	Moderately high

IV. Conclusion

Preventive measures that include proper oral hygiene, plaque control, and fluoride therapy are required prior to and after dental treatment. The use of resin-modified glass-ionomer materials is recommended for these restorations because of their cariostatic properties in patients with a high caries risk.

Declaration

I hereby declare that I am (Author) solely responsible for the study and contents of the following manuscript.

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