



## **ROOT CARIES AND IT'S MANAGEMENT- A REVIEW**

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### **ABSTRACT**

Root caries is a lesion located on the root surface of a tooth, usually close to or below the gingival margin. Root caries may or may not be cavitated, showing a continuum of clinical symptoms from a small, slightly softened and discoloured area to an extensive, yellow-brown, soft or hard area that encircles the entire root surface. Some of the common factors leading to root caries are xerostomia, gingival recession, primary tooth caries, recurrent caries, erosion, abfraction, malocclusion and diabetes. There are several methods to manage root caries. It involves conventional methods and atraumatic restorative treatment. There are also many prevention treatment to reverse root caries.

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### **INTRODUCTION**

Root caries is a problem for a high percentage of elderly patients.[1] Nearly half of all individuals aged 75 and older have root caries.[2] Root caries is a dynamic disease process initiated at the cemento-enamel junction or on root surfaces, typically following apical recession of the gingival margin. Studies have indicated increased risk for root caries among individuals with exposed root surfaces, gingival attachment loss and deep pocket probing depths.[3] Many risk factors can compromise an older adult's systemic health such as sociodemographic variables, nutrition/diet, and weakened immune system.[4] Patients with gingival recession, poor oral hygiene, a cariogenic diet, multiple restorations, multiple missing teeth, existing caries, who are taking xerogenic medications, or who have compromised salivary flow rates for any reason may be considered at high risk for root caries.[5] This global increase in caries prevalence affects all individuals and all surfaces of teeth.[6] Awareness and promotion of water fluoridation, fluoride applications, emphasis on proper tooth brushing with a fluoride dentifrice, flossing, a proper diet, and regular dental office visits can hinder the progression of future caries and can result in an increase in the oral health of all individuals.[6] Root caries prevention requires proper assessment and observation of the caries risk level for the patient.[7] The key to any successful dental procedure begins with the proper diagnosis. Different alternatives in the management of root caries have been suggested, ranging from conventional removal with rotary

instruments and sealing with polymer materials to the use of fluoride toothpastes and other remineralising agents.[8] Studies have shown that one's preference to sweet carbohydrates may put one at risk for caries [9] particularly in the absence of fluoride.[10] Long-term regular doses of medications containing glucose, fructose, or sucrose may also contribute to caries risk. [11]

#### **Etiology of root caries**

Sjögren's syndrome, xerostomia, therapeutic radiation to the head and neck which lower salivary flow rate elevate a patients risk of caries.[12] Adults who have lived in fluoridated areas throughout most of their lives have lower prevalence to root caries.[13] Prevention and treatment can be achieved by identifying and arresting or reversing the disease at an early stage.

Streptococcus mutans was found to be the primary initiating microorganism.[14] Lactobacillus and Actinobacillus are believed to have adjunctive roles.[15] Candida albicans has been identified in soft lesions.[16] A recent study suggests that Lactobacillus casei, L. paracasei, L. rhamnosus, and Pseudoramibacter lactolyticus are also associated with root caries in older adults. These findings suggest that the microbiology of root caries differs from coronal caries.[17]

#### **Risk factors**

Xerostomia, high plaque and calculus deposition, frequency of carbohydrate intake, malocclusions, abfraction, drifting and tipping. Advanced age, physical disabilities, diabetes, autoimmune disorder or radiation therapy, addiction to alcohol and narcotics, limited exposure to fluoridated water.[7]

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### Diagnosis

Root caries, however may involve the less mineralised cementum first or, more likely, the dentine which is also contains much less mineral than enamel.[18] Clinical examination to assess the presence of root caries is best carried out with an explorer that can detect differences in the surface character and surface contours.[19] Accurate radiographs are very important diagnostic tools. [20] Special dyes can be useful for detecting root caries, which sometimes exhibits similar colour to dentin. These dyes stain the infected dentin and allow the clinician to detect hidden caries.[7]

### Prevention

Applying topical fluoride plays an important role in prevention of root caries because it promotes the remineralisation process and reduces the rate of demineralization. Numerous methods are there by which fluoride can be supplied. Exposure to fluoride in drinking water results in increasing resistance to root caries, and people living in areas with fluoridated water are less prone to caries in general than those who live in areas lacking fluoridated water. [21] Topical fluoride products are available as sodium fluoride rinse, chlorhexidine rinse, and neutral sodium fluoride gel, fluoride chewing gum, and fluoride containing varnishes. [7] Preventive measures include educating patients to avoid high sugar-containing meals, maintaining a proper toothbrushing technique and oral hygiene measures, and having regular dental checkups. The clinician should direct special attention to root caries-prone patients who are wearing dental prostheses. Proper management of soft tissues during fixed prosthesis procedures and avoiding placing the margins of a restoration coronal to the surrounding tissue to eliminate plaque accumulation should be followed by the clinician. [7]

### Treatment

Treatment should be done based on the risk factors. Treatment strategies is based on the clinical examination and findings, and are determined by the size, type, extent, and location of the lesion, esthetic requirements as well as the physical and mental condition of the patient. Success rate depends on degree of defect and recession.[22] Root caries are present mostly in subgingival area. Proper access and isolation is very important for treatment of root caries. Retraction cord and proper clamp should be used for isolation. Other isolation techniques like cotton rolls can be used. Cavity preparation depends on the extent of the lesion. The surface should be cleaned with fluoride-free pumice for removal of plaque.[7] The removal of caries is done mostly by rotary instruments sealing with polymer materials to the use of fluoride toothpastes and other remineralising agent. [23] softened tissue of the lesion can be removed by atraumatic restorative treatment (ART). In the method the lesion is removed with manual instruments and is sealed with adhesives like Glass Ionomer Cement. [24] This has advantage only in removal softened tissue of the lesion. The restoration is difficult to polish, there is a risk of leakage and compound cavity fracture, and aesthetics are limited.[25]. Studies that assess ART for root caries of permanent teeth are rare. [26] The conventional technique with rotary instrumentation continues to be the method of choice as long as the patient can visit a dental clinic or when a portable dental unit is available to perform the procedures at a geriatric institution. [25].

### Restorative materials

The dental practitioner should customise a treatment according to the needs of the patient and should understand the cause for the particular oral disease, in order to provide proper treatment. There are different restorative materials are available. Gold filling is used, but its use is limited due to the availability of new materials. Amalgam restoration is done for more than 150 years but this material lacks aesthetic appearance, is brittle, has no therapeutic effect, and cannot bond to tooth structure. Hence usage of amalgam is limited.[7] Old Glass-ionomer cements are biocompatible, achieving a chemical bond to enamel and dentin, and releases fluoride. These materials are aesthetically poor [27] Resin-modified glass-ionomers are indicated for high caries-risk patients. They are biocompatible, bond to enamel and dentin, possess thermal expansion and contraction characteristics that match tooth structure well, and have an anticariogenic effect and it also releases fluoride. Glass ionomer cements are fluoride reservoirs and are well known for reducing caries. To achieve better aesthetics GIC is used as a base. [7]

Resin composites are highly aesthetic and bond to enamel and dentin but they don't have anti cariogenic effect because they don't release caries. Resin composites require proper isolation and Placing a bevel on the enamel margin is desirable for better aesthetics and retention [7]. Compomers are polyacid-modified resin composites and thus possess properties of both glass ionomers and resin composites. The compomers can be used in low-stress areas where aesthetics is a concern.[28]

### CONCLUSION

Root caries are more common in elderly people. Nowadays people prefer to retain their natural teeth than to go for dentures. In this case the need to understand the nature and causes of root surface lesions is of great importance. preventive measures should include educating patients about the prevalence of root caries and usage of fluoride therapy. It also include educating patients about proper oral hygiene, plaque control, and fluoride therapy prior to and after dental treatment.

Resin-modified glass- ionomer materials is Preferred in patients with higher risk of root caries.

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