



Review Article

Atraumatic Restorative Treatment in Management of Dental Caries – A Review Article

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Abstract

Dental caries is a long-term, sugar-dependent condition. It deteriorates the quality of life and has negative effects on the oral cavity, including pain induction, tooth structural damage, cavity development and tooth decay. The traditional technique of treating dental caries often entails rotary burs, local anesthesia, electrical supply and skilled workers. The development of atraumatic restorative therapy (ART) was prompted by the need to treat dental caries in children and the impoverished in less developed nations with limited access to dental facilities and qualified practitioners. Atraumatic restorative treatment treats decaying teeth with manual excavation rather than local anesthesia, rotary burs or advanced dental equipment. A variety of adhesive materials, including glass ionomer cement are used in ART to reconstruct teeth.

Keywords : children, minimally invasive techniques, glass ionomer cement, rural areas

INTRODUCTION

A conservative approach in treating dental caries is atraumatic restorative therapy. Dental drills and local anesthesia are not used in the ART procedure to prepare the cavity. ART is carried out manually; it removes damaged dental tissues, protects the tooth's structure and fills the cavity with restorative materials. This method increases patient comfort during the treatment without creating any discomfort or irritation to the pulpal tissue. In 1985, Jo Frencken developed the atraumatic restorative therapy. In the past, only hand instruments were used to remove the decaying tissue from the tooth and replace it with glass ionomer cement, which releases fluoride and aids in the remineralization of the tooth.

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ART IN PRIMARY DENTITION

In order to treat dental caries, atraumatic restorative treatment is contrasted with conventional treatment utilizing diverse materials such as H-GIC, composite material and modified GIC. The findings demonstrate the failure of ART in primary dentition using H-GIC restorative material. However, compared to a conventional approach, it lessens the discomfort. There hasn't been enough discussion of the failure of RM-GIC and composite materials in permanent dentition (1).

The hall approach and atraumatic restorative therapy are both minimally invasive procedures done on children. The atraumatic restorative therapy provides the kids with better comfort throughout the operations. In non-clinical settings, both approaches are employed. During the restoration of occlusal proximal cavities, hall techniques have primarily been used more frequently than atraumatic restorative therapy (2).

In comparison to occlusal proximal caries, atraumatic restorative therapy has a higher survival rate in cavities with one surface. When compared to the more traditional methods of light-cured composite or amalgam restoration in the posteriors of primary dentition, glass ionomer cement is highly viscous and has a good survival rate in primary molars (3).

Atraumatic restorative therapy is contrasted with conventional methods. According to the findings, atraumatic restorative therapy is more effective than the standard method at filling primary molars with high-viscosity glass ionomer cement (4).

Treatment of a decayed tooth with a significant multi-surface carious lesion using ART is not very effective. According to the findings, there is a very low chance that multi-surface cavities will survive atraumatic restorative therapy. Additionally, there is a premature loss of restoration using ART, but the majority of restored teeth survived until the study's conclusion with no signs of secondary involvement of caries or dental abscess (5).

MANAGEMENT OF EARLY CHILDHOOD CARIES WITH ART

Dental operations are out of reach for the impoverished in remote locations. Because dental operations are performed by experienced specialists in premium dental settings. Therefore, the concept of ART, which has a good rate of success in treating pediatric dental caries, is particularly beneficial to those living in rural areas. The findings demonstrate that atraumatic restorative procedures will provide patients with an effective means of treating decayed teeth without causing them any pain or discomfort. Manpower is used to seal pits and fissures in the primary dentition with H-GIC restorative material under finger pressure. More cases of dental caries are found in rural areas, particularly in children, where access to affluent dental care and a skilled workforce are limited. Additionally, it is very expensive and heavy for residents of rural areas. Therefore, treating decayed teeth in children and rural residents by combining ART and fluoride varnish has been very successful. (6).

In treating dentinal caries, especially in the primary teeth, 30% silver diamine fluoride is compared to ART for effectiveness. According to the findings, silver diamine fluoride only requires a short amount of time compared to ART for treating childhood caries. However, the outcomes are comparable, and neither a negative outcome nor any aesthetic perceptions exist (7).

The treatment of dental caries lesions in primary and mixed first-phase dentition with silver diamine fluoride

is compared to atraumatic restorative therapy. Here, we discovered that, as compared to non-traumatic restorative care, silver diamine fluoride significantly improves the arresting impact of caries lesions in primary and mixed first-phase dentition. However, silver diamine fluoride has some drawbacks in the treatment of cavitated lesions (8).

MANAGING HYPO MINERALIZED TOOTH

The greater demineralizing impact on a tooth's outer layer causes the molar incisor hypo mineralization deficiency. It will damage all first permanent molars and result in more dental decay, more tooth wear and tooth loss. Due to the tooth's demineralizing impact, which increases sensitivity to both hot and cold meals, children with hypo mineralized molar incisors will have significant dental caries and tooth loss. Additionally, restoration would not be possible. The non-invasive method of applying silver diamine fluoride to the tooth provided a remedy for this. This method prevents severe caries activity by remineralizing the teeth using fluoride and the antibacterial properties of silver. By using this method, the tooth is prevented from becoming too sensitive. Silver diamine fluoride treatment is the first step in the SMART procedure, which is followed by the atraumatic restorative approach employing HV-GIC to restore the tooth, which prevents caries from returning. Both of them have negligible impact on dental caries prevention and sensitivity reduction in hypo mineralizing teeth (9).

Dental practitioners are looking for strategies to shield young patients from cavitated lesions as the COVID 2019 pandemic outbreaks have an impact on the world's health. The SMART method, a conservative alternative strategy reduced the likelihood of disease transmission by utilizing silver diamine fluoride and using glass ionomer cement by atraumatic restorative approach. The findings indicate that the SMART approach, which uses both SDF and ART, has high clinical effectiveness in treating caries due to its anti-microbial actions. This is a ground-breaking method for treating caries in young individuals during the pandemic's early phases (10).

COMPARISON BETWEEN SEALED & NON-SEALED MOLARS

Dental caries is a chronic illness that mostly affects permanent first molars, which are particularly vulnerable to dental caries in youngsters. ART sealants application was less effective in reducing dentine caries lesion development in first permanent molars compared to nonsealed molars. (11).

Viscous GIC is used in ART in comparison to traditional procedures employing composite to restore primary and permanent teeth. The results demonstrate that ART is very superior and economical for treating single or multiple surface caries lesions in primary and permanent teeth. When repairing multi-surface cavities in the primary teeth, ART has some unfavorable consequences (12).

ATRAUMATIC RESTORATIVE TREATMENT REDUCES DENTAL ANXIETY IN CHILDREN

One of the biggest issues facing kids today is dental anxiety, which has a negative impact on both their quality of life and oral health. Having to cope with their children causes stress for the parents.

In comparison to standard restorative care, ART will lessen children's dental phobia. According to the findings, ART was ineffective in alleviating dental anxiety in youngsters. The conclusions were pertinent to clinical dental practice utilized to manage nervous young patients (13).

The quality of life of children is impacted by early childhood caries (ECC), which affects many children

under the age of six. Therefore, ART has been suggested as a means of treating caries in kids who are afraid of the dentist. According to the severity of the cavitated lesions, non-operative treatments like ART were advised for the management of early childhood caries (14).

ATRAUMATIC RESTORATIVE TREATMENT IN ELDERLY PATIENTS

The success of atraumatic restorative therapy employing GIC in older individuals has been examined. Elderly people are more likely to have dental disorders. The etiological variables for older people include periodontitis, poor dental hygiene, and decreased salivary flow. Specifically, when treating dental cavities using a traditional approach that requires anaesthesia and competent workers, it causes increased loudness, pain, sensitivity and discomfort in senior individuals.

As a result, ART for seniors undergoing dental work evolved. Elders are comfortable with it since it is a conservative technique that causes less discomfort and anxiety and is inexpensive. According to findings, ART offers elderly patients a high chance of survival (15).

An investigation has been done to determine impact of oral hygiene habits, dental cavities, and cervical marginal gaps on the durability of proximal atraumatic restorations. Cervical marginal gaps, as opposed to residual caries under the restorations, had a significant impact on the longevity of atraumatic restorative therapy in the posteriors. However, evaluations are currently being done on the kid and elderly populations' dental hygiene (16).

CONCLUSION

Atraumatic restorative therapy is a conservative method of treating carious teeth that halts the development of profound carious lesions. Pit and fissure sealants are used to repair pits and fissures, while adhesive restorative materials are used to repair cavities. Although it is a palliative and preventative treatment, the major goal of this strategy is to provide oral health care in rural regions.

ART is more effective in treating caries in preschoolers and older patients. Through conservative methods, ART also aids in the treatment of anxiety issues. Additionally, it aids in the treatment of children's early childhood caries and hypo mineralized teeth.

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Conflicts of interest

There are no conflicts of interest

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