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ATRAUMATIC RESTORATIVE TREATMENT –A REVIEW

Sangameshwar Sajjanshetty, Deepa Hugar, Dipak Jain, Saujanya KP, Mohd. Inayatullah Khan

1. Senior Lecturer, Department of Pedodontics, MIDSr Dental College, Latur.
2. Senior Lecturer, Department of Oral Pathology, MIDSr Dental College, Latur.
3. Department of Conservative & Endodontics, Krishna institute of Dental Sciences, Karad.
4. Assistant Professor, Department of Conservative & Endodontics, SMBT Dental College, Sangamner Taluka.
5. Tutor, Department of Physiology, Rajiv Gandhi Institute of Medical Sciences, Adilabad, Andhra Pradesh.

CORRESPONDING AUTHOR

Dr. Sangameshwar Sajjanshetty.
Senior Lecturer,
Dept of Pedodontics.
MIDSr Dental College, Latur.
E-mail: sajjanshettyasangamesh@yahoo.com
Ph: 0091 9503733644

ABSTRACT: Atraumatic Restorative Treatment (ART) was originally developed in field settings in African subcontinent (Tanzania) by University of Dar el Salaam in 1980s; subsequently World Health Organization (WHO) promotes the use of ART especially with children. As the name indicates Atraumatic Restorative Treatment (ART) is basically a minimally invasive procedure that involves removing of softened carious dentine using hand instruments and then restoring the cavity with an adhesive material usually the Glass Ionomer Cement [1]. ART is based on the maximum preservation of sound tooth tissue and the minimum feeling of discomfort and pain, since there is use of hand instruments it perhaps also reduces pain due to reduced vibrations as occurs while use of rotary dental instruments. This technique is gaining popularity and acceptability especially in children, elderly and with those individuals who have fear and anxiety about dental treatment [2, 3]. ART requires use of very minimal portable dental equipment and was designed to use in field/community settings. It was developed for use in less developed countries of the world, where art was seen as an affordable option for patients who can't afford to pay for more sophisticated treatments, but with improved technique and use of improved restorative materials its use has considerable expanded to developed countries as well [4-6]. This article gives a brief overview of ART and its uses in the present scenario.

KEY WORDS: ART = Atraumatic Restorative Technique, GIC = Glass Ionomer Cement

INTRODUCTION: ART was pioneered in Tanzania in as part of a community-based primary oral health program by with support of the World Health organization (WHO). ART was needed to make dental care to be available to socioeconomically weaker sections especially in less developed countries. Art involves removal of soft carious dentine using hand instruments only, followed by restoration of the cavity with modern restorative material with adhesive characteristics [1]. Presently GI that leach fluoride [7, 8] was used as it also minimizes the onset of secondary caries [9]. High viscosity Glass Ionomer Cement (Fuji IX) was used it simplifies the restorative process and enable dentine-pulp complex to react against carious process [10]. GIC creates a chemical bond between the cement and the remaining enamel and dentine. This adherence provides an adaptive seal, and, as the material slowly leaches fluoride ions into the

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adjacent tooth tissue, GICs are capable of halting or slowing the progression of carious lesions [11].

TECHNIQUE OF ATRAUMATIC RESTORATIVE TREATMENT: Briefly here is described a standard procedure for Art depending on circumstances, available resources and clinical settings the procedure is modified accordingly.

ART INSTRUMENTS: Centre for Oral health services research of WHO have developed an instrument set a total of 8 instruments are supplied in form of kit [12]. The numbering system of the instruments corresponds with the art manual published by who which helps in identification of instruments.

It contains;

1. Mouth mirror
2. Explorer
3. Tweezers
4. Spoon excavators (small, Medium, Large)
5. Enamel Hatchet
6. Double ended carver
7. Enamel access cutter.
8. Instrument tray.

STEP I: ISOLATION :

1. Reasonable light source weather natural or artificial should be available.
2. Isolate the operating area with cotton rolls.
3. The cavity is cleaned with moist cotton and dried using small cotton pellets or a chip blower.

STEP II: EXCAVATION OF THE CAVITY

1. The caries is excavated depending on its size with a suitable spoon excavator.
2. Only soft carious infected is removed.
3. Remove all the unsupported enamel with an enamel hatchet.

STEP III: FILLING WITH GIC :

1. Glass Ionomer Cement is mixed as per manufactrers instructions and carried to the cavity using blunt end of the applier.
2. Put small of cement at a time in the cavity. This will ensure complete filling of the cavity without any air voids which would ultimately be detrimental to the strength and integrity of the restoration.
3. Use round surface of a medium excavator to push the mixture into deeper parts of cavity and under any overhanging enamel.

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4. The cavity is finally filled by press finger technique [13]. The finger is moved side ways with pressure to remove excess of GIC which is then removed by sharp end of carver.
5. Cavity is restored and the adjacent fissures are sealed with GIC at the same time. This is called sealed restoration.
6. Give appropriate setting time for the GIC which is as per manufacturer instructions.
7. Then check the bite using articulating paper and remove any excess cement if needed.
8. Remove the cotton rolls
9. Advise the patient not to eat or bite hard objects at least for one hour.

CLINICAL PERFORMANCE OF ART: Survival rates of art restoration were similar or superior to those achieved with amalgam restorations after 6 years [14, 15, 16, and 17]. In a study conducted by Regia Luzia et al; [19] the cumulative survival rate of ART single-surface restorations remained high throughout the study—92.7% over 2 years and 65.2% up to 10 years.

One study done by de Amorim, Rodrigo et al; [18] The survival rates of single-surface and multiple-surface ART restorations in primary teeth over the first 2 years were 93% for single-surface ART restorations in permanent teeth over the first 3 and 5 years it was 85% and for multiple-surface ART restorations in permanent teeth over 1 year it was 86%.

Lo, E C M et al; [19] have shown that The 24-month cumulative survival rates of ART restorations in the primary teeth were 93 and 90% for the ChemFlex and Fuji IX GP class I restorations, respectively, while 40 and 46% of class II restorations placed with the respective materials were satisfactory. In the permanent dentition, only class I restorations were involved and the cumulative survival rates were 95 and 96% for ChemFlex and Fuji IX GP. For the primary teeth after 24 months, net mean occlusal wear was 87 microm for ChemFlex and 85 microm for Fuji IX GP. The occlusal wear in the permanent teeth was 75 microm for ChemFlex and 79 microm for Fuji IX GP.

Yip, Hak-Kong HK et al; [20] used Glass-Ionomer Cement restorations, when the atraumatic restorative treatment method was used, significantly better survival rates were found for Class I (92.9%) than for Class II (64.7%) cavity preparations. There was also a strong trend for relatively better survival rates for the conventional cavity preparation method (86.7%) than for the atraumatic restorative treatment (64.7%) method for Class II cavity preparations. However, both the atraumatic restorative treatment and conventional methods appeared equally effective for Class I preparations.

Frencken, J E [21] observed that the Results after 1 year revealed a survival percentage for one-surface ART restorations of 93.4 whilst the complete and partial retention percentages for sealants were 60.3 and 13.4, respectively. No caries was observed in teeth restored using ART, and only 0.8% of surfaces diagnosed as having early enamel lesions at the start of the programme and sealed consequently had progressed into active dentinal lesions after 1 year.

Da Franca, Carolina C [22] showed that by art which were evaluated at 1, 12, and 24 MONTHS. The best results were found for class I in each period of follow-up. After 1 month, the success of class I restorations was 94.6% and class II restorations 70.1%. After 12 months, the success rate was 50.6% for class I and 15.2% for class II. The most frequent failure characteristics were totally or partially lost and gross marginal defect. The rate of success of restorations using the ART approach was significantly lower for class II.

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CONCLUSION: Atraumatic restorative treatment needs to be considered with a proper clinical perspective, where as it may be considered as the treatment modality for communities with no access to dentists. It is basically remains a caries intervention procedure to communities which have access to high quality dental care. As the results have shown in many studies the out come from ART restorations especially of Class I cavities is always much better as compared to class II, it can there fore considered as a standard procedure for class I cavities. For Class II cavities it should be considered as an interventional procedure and more studies of atraumatic restorative treatment in both developing and industrialized countries are needed to validate its effectiveness and acceptability.

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