

REDUCTION OF DENTAL FEAR AND ANXIETY: THE OUTLOOK OF ATRAUMATIC RESTORATIVE TREATMENT

ABSTRACT

AIM: This study aimed to report a case in which the technique used was the atraumatic Restorative Treatment (ART) in patients with fear of conventional treatment. **MATERIAL AND METHODS:** This procedure consisted in the treatment of carious lesions in the patient associated with the program of educational and preventive measures which the patient has undergone. The technique described here was performed on tooth 85, which presented atypical carious lesion cavity, through the removal of softened carious tissue with the use of hand instruments, without anesthesia and use of direct restorative material with fluoride release (glass ionomer cement). **RESULTS:** As a result of this technique, there was greater patient cooperation and decrease of anxiety initially revealed. **CONCLUSION:** Thus, it might be concluded that the Atraumatic Restorative Treatment is a technique already established that showed clinical effectiveness in controlling the evolution of the carious process and that being well indicated, was able to induce more cooperation from the patient, leading to the success of therapy restorer. The conventional glass ionomer cement showed excessive surface wear and therefore should not be used to restore atypical cavities.

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KEYWORDS

Anxiety. Atraumatic restorative treatment. ART. Glass ionomer cement.

INTRODUCTION

Even nowadays which present a preventive profile widely released among the population, the Dentistry still faces a great challenge: rejection of treatment by many patients due to their fear of pain feeling or to procedures that cause discomfort, affliction or concern^{1,2,3}.

Na anxious patient tend to avoid dental treatment and, once in the clinic, the attendance become difficult², because he/she cannot manage this feeling at each step of the procedure and presents resistance to the of some instruments such needles, syringes, motors, among others. This phenomenon is particularly common among children, what demands, from the professional, the performance of emotional conditioning previously the treatment. Thereat, the dental surgeon should search reduce the expositions to stimulus which trigger the anxiety and transform the treatment in a positive experience as a way to improve the oral health of these patients⁴.

It is also due to the anxiety to the dental treatment that occurs the prorogation of the consultation to the dental surgeon until the moment that the pain or discomfort appear. Insomuch, the anxiety or phobia can lead not only to a defective oral health and tooth loss, but also so the shame and inferiority feelings⁵.

In this context, we search to solve problems presented through procedures more

and more invasive to avoid the anxiety generated to the patients^{1,3}, as well as to preserve the dental structure and keep the population active on the oral disease prevention process⁶.

According to Wambier et al.⁷ (2003), an alternative method was developed for treatment of carious disease by Frencken in 1992, which was called Atraumatic Restorative Treatment (ART) in order to minimize the discomfort caused during dental treatment for those anxious patients, further other several indications, such as the attendance to bedridden patients, poor communities, regions with low infrastructure and lack of dental clinics and public services, among others.

Among its advantages we detach: simple technique with fast execution because it does not need cavity preparation; it does not need highly qualified stuff for execution; the use of rotary instrument is dismissed; it requires minimum structure, without electric power; the use of GIC (Glass Ionomer Cement) promotes constant release of fluoride in the mouth cavity and adhesive strength to the dental structures⁸.

According to Figueiredo et al.⁹ (2008), ART presents some principles to be indicated: permanent and deciduous teeth with occlusal and occlusal-proximal, but they should not be near to the pulp or with spontaneous painful symptoms. Its contraindication is for presence

of abscess, fistula and cavities without proximal and occlusal access.

With this treatment proposal, it was searched achieve a minimal operative intervention, reducing the probable need of endodontic treatment and future extraction, and therefore less uncomfortable for the patient¹⁰.

Besides, Carvalho et al.¹ (2009) considered that, with the Philosophy of atraumatic restorer treatment, oral health education and prevention of diseases should be part of the rehabilitation process for any child. Thereby, atraumatic restorer treatment is composed by two stages: restorer, educational and preventive.

Thus, this study had as aim to report the clinical case of an anxious patient who presented carious lesions in deciduous tooth 85, which was submitted to the Atraumatic restorer treatment and also observe the result of the technique five months after clinical follow-up.

CASE REPORT

The performance of this study was linked to the approval by the Ethics Research Committee of the University Center of Araraquara (UNIARA) under the protocol number 912/09; the participation of the patient was linked to the correct fill and signature of the Consent pre-informed

statement by the parents or responsible by the patient.

At the dental clinic UNIARA - Unit IV, a male gender patient, 6 years old, presented complaining caries lesions and need of treatment. When performing the anamnesis and the clinical examination, poor oral hygiene, cariogenic diet and excessive consumption of citrus foods were observed. It is important highlight that the patient demonstrated some behavior problems like anxiety during the first consultation and face to the professional contact and the clinical environment, further report fear of "feel pain".

The atraumatic restorative technique was indicated because the patient was anxious and with behavior problems face to the use of anesthesia and the high speed rotating device. It is important highlight that, even in the teaching environment of dental clinic, the procedure was carried out simulating a field situation, avoiding the use of the reflector, photopolymerizer, high and low rotation devices, triple syringe, among others, in order to minimize the negative stimulus which could cause any sensation of fear or anxiety during the consultation. The process consisted in the removal of softened decayed tissue with hand tools, without anesthesia and using direct restorative material with fluoride release. The procedure was carried out on the teeth 85 that presented extensive carious cavity with depth average (Figure 1), softened dentin tissue

without clinical evidence of involvement of the pulp tissue.

Figure 1. Carious lesion in the element 85.



The clinical procedure adopted is following described: (1) supervised toothbrush previously the treatment; (2) relative isolation of the operative field with cotton roll in the bottom, vestibular groove and lingual regions, when it is possible; (3) brushing on the mass of the softened dentin tissue of the tooth 85 (Figure 2) using hand tools in appropriate size, according to the cavity (spoon excavator # 11 ½ e 18), restricted to the infected, disorganized and softened dentin, keeping the affected dentin liable of remineralization, clinically characterized by “splinters”. (4) washing the cavity with cotton balls soaked in water and drying with cotton balls; (5) cleaning and decontamination of the cavity by 10 seconds with the liquid of the restorer material that contains weak acid (tartaric acid), followed by washing and drying; (6)

proportioning of the powder and the liquid of the conventional glass ionomer cement chemically activated – (Vidrion R, SSWhite Artigos Dentários Ltda, Rio de Janeiro, RJ, Brazil, lot: 0060709). The agglutination of the material was carried out using a spatula number 24 (Figure 3). Thereunto, the powder portion was divided into its half and to one of these parts was incorporated the liquid and next the other part of the powder was incorporated, completing 1 minute of manipulation, obtaining homogeneous and bright mix, according to the manufacturer’s recommendations; the work time obeyed was 3 minutes. (7) Filling the cavity with GIC manipulated with a spatula number 1, applying digital pressure during 30 seconds to improve the marginal adaptation to the cavity walls and avoid blistering; (8) checking the occlusion out with articulating paper and occlusal adjustment with spatula Holleback number 33; (9) protector varnish was applied (Figure 4) - (Cavitine, SSWhite Artigos Dentários Ltda, Rio de Janeiro, RJ, Brazil, lot:0050809) with disposable brush on the GIC external surface of the restoration to avoid syneresis and soaking (loss or gain of water); (10) when the restoration was finished, the patient was oriented do not consume food or beverage before the period of 1 hour from the restorer procedure performing, as well as avoid ingesting food containing dye on the early 24 hours.

Figure 2. Carious dentin liable to be removed with hand tools.

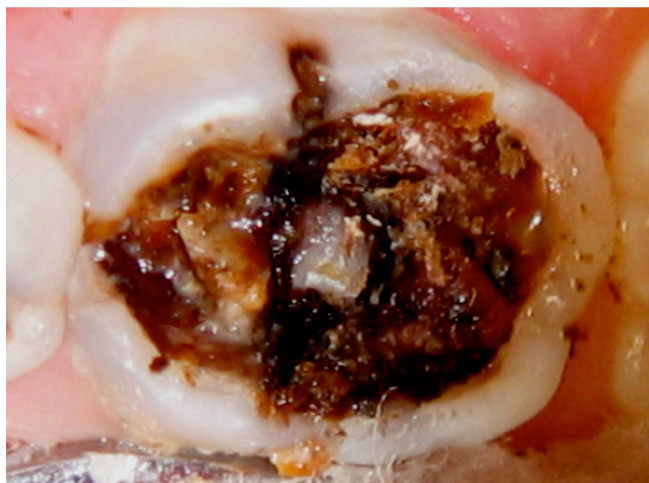
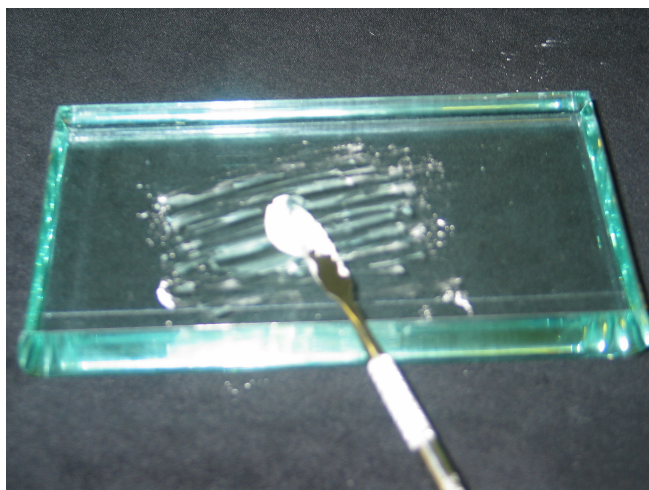


Figure 3. Glass ionomer cement (GIC) manipulation.



Other caries lesions were restored during the period of 2 months of treatment, associated to the use of preventive measures. It is highlighted that some restorations carried out posteriorly to this clinical case were performed by the traditional method and not through ART, because the patient, at that moment, already presented conditioned behavior and trust on the professional.

GIC restoration was monitored and on the evaluation after 5 months, an excessive wear on the material was observed, with

dentin exposition on the banks of the restoration (Figure 5).

Figure 4. Cavity varnish applying for surface protection of the GIC.



Figure 5. Clinical monitoring after 5 months from the restoration through ART.



DISCUSSION

Current dentistry searches the prevention of buccal diseases through health promotion, where the population receives information about healthy habits of hygiene and diet. Similarly, the professional searches to carry out the clinical interventions that

minimize the loss of dental structure. Inside the philosophy of minimally invasive Restorative Dentistry appears the need to develop a technique which approach patients with behavior problems, difficult to the dentistry access or presenting high risk of caries, as well as solve the difficult on the Public Health¹¹⁻¹³.

Then, the ART is a technique recommended and accepted since 1994 by World Health Organization (WHO) for treatment of dental caries as an alternative to the conventional method, not only by the easily application of the technique, but also because the properties of the material used. Thus, it is viable its utilization in poor communities with low family income¹⁴ and/or institutionalized, where there is a lack of technical and human resources for specialized treatment, as well as in low-age children because there is difficult to control and for treatment¹⁵.

In this work, the ART was selected as restorer procedure because the patient presented anxiety before the dentistry treatment, and being a child with unfavorable behavior. Despite the environment for attendance had been the teaching environment of dental clinic, which offered appropriate conditions for conventional treatment, the option by ART occurred because of the initial difficulty to conditioning the patient to accept the local anesthesia and the rotational instruments. According to Freire et al.¹⁶

(2003), this technique is addressed to the patients who present as characteristics the fear and anxiety; mental and/or physical disability; very young patients, who never received conventional dentistry treatment; elderly who cannot leave home or the institution where they live and patients with high risk of caries in order to stabilize the buccal health conditions. Other important indication would be for babies and patients with special needs by the same reason previously mentioned.

ART technical advantage is the removal only of demineralized tissue, remaining affected dentin, which is harder and liable to be remineralized¹⁷. The filling of the cavity prepared, when carried out with glass ionomer cement, priority properties like bonding capacity and fluoride release¹⁸. However, the ART does not achieve the restorer needs of other types of cavity and the right diagnosis is essential to succeed in long term^{8,19}.

Thereunto, before the decision by the technique, some aspects have to be analyzed, like the absence of periodontal or radiographic changes, dental mobility and spontaneous pain, because they are the prime conditions to use the ART¹⁹. In the clinical case presented, all these changes were evaluated, except for the radiographic exam, because a situation in the field was simulated, where there were not X-Ray apparatus available. Besides, there are contraindicated factors for this technique, like advanced stage of caries with pulp

commitment, abscesses, fistula and cavities without proximal or occlusal access⁹.

Nascimento and Rego¹⁷ (2004) , as well as Silva et al.²⁰ (2006) detached that this treatment minimizes the use of local anesthetic because it limits the pain, facilitates cleaning and disinfection of the instruments used and the restoration damaged is easily retrievable. This context allows the attendance of patients who cannot assimilate the use of anesthesia previously to the operative procedure.

On the other hand, technical limitations are found in the literature, as difficulty for appropriate filling of wide cavities; possibility of manual fatigue due to the time and manipulation of the material, that can suffer interferences regarding to the person applying the technique and the climate situations. It is considered that the technique requires constant attention in each execution stage and it is observed relative resistance by some patients in accept that the restoration with GIC has permanent character¹⁷.

Regarding to the restorer material used in the ART, the glass ionomer cement (GIC) is detached, characterized by its properties of chemical bonding to the enamel, dentin and cement, biocompatibility, durability, continuous fluoride release, acting positively on the buccal microbiota and the remaining dentin¹². According to Mônico and Tostes⁸ (1998), one of the most relevant properties of GIC would be its continuous fluoride release

and the possibility to suffer reloads, allowing act as a constant fluoride reservoir inside the mouth cavity, consequently helping on the remineralization process through the exposition to several sources, like fluoridated toothpaste, mouth rinses and topical fluoride of professional applying, among others. Relative to the bacterial control, Davidovich et al.²¹ (2007) proved, in their study testing several trademarks of GIC that it has great potential to control cariogenic bacteria, what results in prevention of secondary lesions. It is still detached that the fluoride released promotes a continuous action on the adjacent dental structure, decreasing its solubility and thereby also acts on the reduction of incidence or severity of eventual recurrent lesion of caries²².

Oliveira et al.¹⁵ (2004) allege that the sealing of carious cavities with bonding material promotes decrease of cariogenic activity through reduction of quantity of cariogenic microorganisms, increase the mouth pH and consequently remineralizes the lesion of caries.

However, the material can be considered one of the limitations on the ART, because conventional glass ionomer cements for restoration presents problems with solubility and degradation due to the syneresis and soaking phenomena, further unfavorable mechanical properties, like low cohesive resistance and wear. This fact could be proved

in this study, once when evaluating again the restoration after 5 months, a surface wear with exposure of the cavity margins was observed. Still in this context, we highlight what reported by Lo et al.²³ (2006) when evaluated the permanence of atraumatic restorations and conventional ones after 12 months, and they observed there was a similar pattern of retention of restorations, although some of them performed with GIC had presented excessive wear (20,3%).

Therefore, with wide use and technical acceptance, there was the need to improve the material specifically for ART. In the 1990s appeared the High Viscosity Glass Ionomer cements. They constituted important contribution to the ART because the improvement in the properties, when compared to the conventional ones¹⁰. Another aspect that should receive special care to achieve good clinical performance of this material is regarding to its manipulation. Some authors^{16,24} reported that the experience of the manipulator exercise great influence on the result of treatment and the succeed of technique.

According to Bresciani et al.¹⁰ (2002), the main aspect for long duration of restoration with GIC would be maintenance of a field free of saliva contamination, because when it happens during the restorer stages, it leads to a pattern of poor condition, to a negative interference on the bonding process

of the material to the cavity walls and to the decrease of final resistance. It can justify the failure of technique, as well as the unsatisfying removal of caries tissue.

Regarding to the immediate surface protection of these restorations, it is necessary because on the early 24 hours occurs the reaction of the material and in this period, the GIC become susceptible to loss and gain of water, factors that can lead to the failure on the treatment^{25,26}.

Concerning the wear suffered by the restoration after 5 months, we can consider that the GIC used in the case reported (low viscosity and chemically activated) has limited indication for atypical cavities and patients who present diet rich in citric food.

It should be considered that the first GIC used on the technique presented low viscosity, what enabled only its use in areas with low stress, like cervical cavities. With development of GIC with physical characteristics more appropriate for areas with higher masticatory stress, like occlusal and atypical ones, it is noticed an increasing advancement of the success of technique²⁷.

Pelegrinetti et al.²⁸ (2005) evaluated the retention of the GIC in atypical restorations inserted in the ART program during 24 months and observed the absence of 29,4% of restorations, what can be considered a relatively low percentage of failure of the material. It makes us believe that the technique

ART in atypical restorations present conditions of success in long term.

The use of ART can be considered a motivational factor to reverse the risk of caries in patients with high cariogenic activity, controlling the factors that promote the disease¹⁸. Therefore, it is observed that the standstill of the caries process does not require sophisticated treatment with high technology, but the removal of the microbial cariogenic biomass, from superficial curettage of injuries, removing the most necrotic and disorganized softness tissue, and maintaining demineralized tissue¹⁹. This procedure should be always associated to the instructions of oral hygiene and appropriate diet, considering that the frequent consumption of cariogenic food might be related to the high severity of caries, as reported by Peres et al.¹⁴ (2000). It shows that, for the clinical condition presented in this study, the technique presented was an important alternative for treatment, because it had good acceptance by the patient and mainly, the preservation of deciduous tooth inside the buccal cavity, searching attend the need of treatment associated to the peculiar characteristics of the patient before the dentistry treatment.

CONCLUSION

Based on the above, we conclude that: (1) to the clinical case presented, it was observed that the technique, as well indicated,

was able to induce better collaboration by the patient, decrease of anxiety and result in a restorative therapy, (2) the glass ionomer cement showed itself as a good material to promote the caries standstill, because it presents appropriate biological properties, however, its mechanical properties still need to be improved, (3) the conventional glass ionomer cement presented excessive superficial wearing and, therefore, it should not be used to restore atypical cavities.

REFERENCES

1. Carvalho LS, Aldrigui JM, Bonifacio CC, Imparato JCP, Raggio DP. Tratamento restaurador atraumático em cavidades atípicas. RGO 2009;57(3):357-62.
2. Ferreira CM, Gurgel-Filho ED, Bönecker-Valverde G, Moura EH, Deus G, Coutinho-Filho T. Ansiedade odontológica: nível, prevalência e comportamento. RBPS 2004;17(2):51-5.
3. Schirks MCM, van Amerogen WE. Atraumatic perspective of ART: psychological and physiological aspects of treatment with and without rotary instruments. Community Dent Oral Epidemiol 2003;31(1):15-20.
4. Kanegane K, Penha SS, Borsatti MA, Rocha RG. Ansiedade ao tratamento odontológico no atendimento de rotina. RGO 2006;54(2):111-4.
5. Petry PC, Toassi RFC, Scotá AC, Fochesatto S. Ansiedade do paciente idoso frente ao tratamento odontológico. RGO 2006;54(2):191-4.
6. Oliveira MT, Bittencourt ST, Oliveira MDS, Hube R, Pereira JR. Avaliação clínica do desempenho de TRA

(Tratamento Restaurador Atraumático) associado a um agente químico de remoção de cárie. *Rev Odonto Ciênc* 2009;24(2):190-3.

7. Wambier DS, Paganini F, Locatelli FA. Tratamento Restaurador Atraumático (estudo da sua aplicabilidade em escolares de Tangará-SC). *Pesq Bras Odontoped Clin Integr* 2003;3(2):9-13.

8. Monico M, Tostes M. Tratamento restaurador simplificado para atendimento infantil (ART). *JBP: J Bras Odontoped Odont Bebê* 1998;1(4):9-16.

9. Figueiredo KSP, Forte FDS, Sampaio FC. Desempenho clínico de restaurações ART (Tratamento Restaurador Atraumático) em crianças atendidas na clínica de cariologia da UFPB. *Rev Odont UNESP* 2008;37(4):351-5.

10. Bresciani E, Nogueira DA, Quintans NH, Barata TJE, Lauris JRP, Navarro MFL, et al. Influência do isolamento absoluto sobre o sucesso do Tratamento Restaurador Atraumático (ART) em cavidades classe II, em dentes decíduos. *Rev Fac Odont Bauru* 2002;10(4):231-7.

11. Lima DC, Saliba NA, Moimaz SAS. Tratamento Restaurador Atraumático e sua utilização em saúde pública. *RGD* 2008;56(1):75-9.

12. Ramos ME, Santos MA, Carvalho F, Piro S, Medeiros U. TRA - Uma história de sucesso. *Rev Bras Odont* 2001;58(1):13-5.

13. Zuanon ACC, Campos JADB, Silva RC. Restaurações atraumáticas como alternativa de tratamento em Saúde Pública. *Rev Paul Odont* 2005;27(1):21-3.

14. Peres KGA, Bastos JRM, Latorre MRDO. Severidade de cárie em crianças e relação com aspectos sociais e comportamentais. *Rev Saúde Pública* 2000;34(4):402-8.

15. Oliveira MCL, Fortes TMV, Grinfeld S, Novais SMA. Avaliação de níveis de *Streptococcus mutans* na saliva

quando usado o Tratamento Restaurador Atraumático em crianças. *Pesq Bras Odontoped Clin Integr* 2004;4(1):39-45.

16. Freire MCM, Rabelo AB, Nascimento AP, Valle DG, Antunes DE, Coelho JF, et al. Tratamento Restaurador Atraumático (ART) - estágio atual e perspectivas. *Rev ABO Nac* 2003;11(1):37-43.

17. Nascimento ACB, Rego Ma. Tratamento restaurador atraumático convencional e modificado: vantagens e indicações. *Rev EAP/APCD* 2004;6(1):7-9.

18. Cordeiro MLVP, Tokunaga EMC, Brusco EHC, Imparato JCP. Materiais restauradores ionoméricos para a técnica do tratamento restaurador atraumático. *J Bras Clin Odont Int* 2001;5(30):507-11.

19. Raggio DP, Imparato JCP, Politlano GT, Echeverria SR, Uemura ST, Ferreira EMS et al. Tratamento restaurador atraumático. *RGD* 2004;52(5):355-8.

20. Silva AN, Maia LC, Pierro VSS. O tratamento restaurador atraumático no contexto do Sistema Único de Saúde. *Rev Assoc Paul Cir Dent* 2006;60(4):272-5.

21. Davidovich E, Weiss E, Fuks AB, Beyth N. Surface antibacterial properties of glass ionomer cements used in atraumatic restorative treatment. *J Am Dent Assoc* 2007;138:1347-52.

22. Uematsu NM, Myaki SI, Rodrigues CRMD, Rodrigues Filho LE, Ando T. Avaliação in vitro da liberação de flúor de cimentos de ionômero de vidro utilizados na técnica da restauração atraumática, antes e após aplicação tópica de NAF 2%. *JBP: J Bras Odontoped Odont Bebê* 1999;2(8):269-73.

23. Lo ECM, Luo Y, Tan HP, Dyson JE, Corbet EF. ART and conventional root restorations in elders after 12 months. *J Dent Res* 2006;85(10):929-32.

24. Bonow MLL, Oliveira MAF. Desempenho clínico do tratamento restaurador atraumático (TRA) - Uma revisão sistemática. *Rev Pós Grad* 2001;8(1):83-7.
25. Lima MFB, Camargo LB, Bruder C, Long SM, Chelotti A, Imparato JCP et al. O ART modificado e a utilização de seringa de baixo custo (SBC). *Rev Assoc Paul Cir Dent* 2009;63(2):138-43.
26. Nunes OBC, Abreu PH, Nunes NA, Reis LPKFM, Reis RTM, Júnior AR et al. Avaliação clínica do tratamento restaurador atraumático (ART) em crianças assentadas do movimento sem-terra. *Rev Fac Odont Lins* 2003;15(1):23-31.
27. Frencken JE, van't Hof MA, van Amerongen WE, Holmgren CJ. Effectiveness of Single-surface ART restorations in the permanent dentition: a meta-analysis. *J Dent Res* 2004;83(2):120-3.
28. Pelegrinetti MB, Imparato JCP, Bressan MC, Pinheiro SL, Echeverria S. Avaliação da retenção do cimento de ionômero de vidro em cavidades atípicas restauradas pela técnica restauradora atraumática. *Pesq Bras Odontop Clin Integr* 2005;5(3):209-13.