UNIVERSIDADE FEDERAL DE UBERLÂNDIA
FACULDADE DE ODONTOLOGIA

PEDRO GUIMARÃES MENDES

COMPARAÇÃO DE TÉCNICAS DE ISOLAMENTO PARA RESTAURAÇÕES DE LESÕES CERVICAIS NÃO CARIOSAS EM RESINA COMPOSTA – RELATO DE CASO CLÍNICO

UBERLÂNDIA
2022

PEDRO GUIMARÃES MENDES

COMPARAÇÃO DE TÉCNICAS DE ISOLAMENTO PARA RESTAURAÇÕES DE LESÕES CERVICAIS NÃO CARIOSAS EM RESINA COMPOSTA – RELATO DE CASO CLÍNICO

Trabalho de conclusão de curso apresentado à Faculdade de Odontologia da UFU, como requisito parcial para obtenção do título de Graduado em Odontologia

Orientador: Prof. Dr. Paulo César de Freitas Santos Filho

Co-orientador: Prof. Dr. Alexandre Coelho Machado

Co-orientadora: Mestranda Mariana Fernandes Pires

UBERLÂNDIA

2022

DEDICATÓRIA

Primeiramente à Deus, por ter me concedido saúde, sabedoria e discernimento durante todos esses anos de graduação. Agradeço por ter me sustentado, fortalecido e guardado, principalmente nos momentos mais difíceis que passei longe da minha família e amigos.

Dedico aos meus pais, Jouber e Evanir que sempre me apoiaram, incentivaram e acreditaram em mim. Agradeço pelas orações incessantes, conselhos, puxões de orelha e por sonharem juntamente comigo. Agradeço ao meu irmão Lucas e a minha cunhada/amiga Isabelle, pelo companheirismo de sempre, conselhos, risadas e todo suporte; sem vocês eu não conseguiria, sou grato à Deus pela vida de vocês.

Aos meus avós, especialmente ao meu avô Orlando que não teve a oportunidade de me ver formar e aos meus tios e tias pelas orações, carinho e atenção. Agradeço os meus primos, em especial a minha prima Aline que hoje tenho como irmã, pelo companheirismo, conselhos e cuidado.

AGRADECIMENTOS

Aos professores Paulo César de Freitas Santos Filho e Alexandre Coelho Machado pela oportunidade e confiança em mim depositadas. A mestranda Mariana Fernandes Pires, que foi essencial para a construção desse trabalho. Aos colegas do centrinho de LCNC, a ESTES e a FOUFU, pela minha formação e pela equipe de profissionais que fazem parte dessas instituições. Agradeço às minhas colegas e amigas Ianca, Isadora, Gabriella e Samara pela convivência, palavras motivacionais e conselhos; vocês se tornaram a minha segunda família em Uberlândia.

“Os sonhos não determinam o lugar que você vai estar, mas produzem a força necessária para o tirar do lugar em que está”.

(Augusto Cury)

RESUMO

OBJETIVO

O objetivo é demonstrar e discutir, através de uma série de casos, tipos de técnicas de isolamento para restaurações em resina composta de lesões cervicais não cariosas.

CONSIDERAÇÕES CLÍNICAS

Este trabalho descreve casos em que lesões cervicais não cariosas foram restauradas com três isolamentos diferentes: 1- isolamento relativo com gaze, rolos de algodão e fio retrator no sulco gengival; 2- isolamento modificado com dique de borracha adaptado e fio retrator; 3- isolamento absoluto com dique de borracha e grampos. Para realizar as restaurações das lesões cervicais não cariosas nos casos descritos, foram utilizados adesivo universal, resina composta nanoparticulada e fotopolimerizador com irradiância suficiente. Todos os casos resultaram em bom sucesso clínico, pois reduziu a hipersensibilidade dentinária e repôs estruturas perdidas mantendo a saúde gengival.

CONCLUSÃO

Os métodos de isolamento têm suas indicações, vantagens e desvantagens e cabe ao dentista escolher a melhor opção para cada situação. O sucesso e a longevidade das restaurações dependem também da habilidade e conhecimento técnico e científico do profissional que a realiza.

RELEVÂNCIA CLÍNICA

Lesões cervicais não cariosas que tenham volume suficiente para o material restaurador precisam ser restauradas para evitar a progressão da lesão e restituir ao elemento dental as estruturas perdidas. Este procedimento restaurador é desafiador devido à localização da lesão próxima à gengiva marginal, sendo necessário o uso de

algum tipo de isolamento para expor a marginal da cavidade e permitir um bom procedimento adesivo.

Palavras-chave: Lesão cervical não cariosa; Resina composta; Restaurações; Técnicas de isolamento; Lençol de borracha.

ABSTRACT

OBJECTIVE

The objective is to demonstrate and discuss, through a series of cases, types of isolation techniques for non-carious cervical lesion composite resin restorations.

CLINICAL CONSIDERATIONS

This paper describes cases which non-carious cervical lesions were restored with three different isolations: 1- relative isolation using gauze, cotton rolls and retraction cord in the gingival sulcus; 2- modified isolation with an adapted rubber dam and retraction cord; 3- absolute isolation with rubber dam and clamps. To perform the restorations of the non-carious cervical lesions in the cases described, universal adhesive, nanoparticulate composite resin and a light-curing unit with sufficient irradiance were used. All cases resulted in good clinical success, as it reduced dentin hypersensitivity and replace lost structures while maintaining gingival health.

CONCLUSION

Isolation methods have their indications, advantages and disadvantages and it is up to the dentist to choose the best option for each situation. The success and longevity of restorations also depend on the skill and technical and scientific knowledge of the professional performing it.

CLINICAL RELEVANCE

Non-carious cervical lesions that have sufficient volume for restorative material need to be restored to prevent the progression of the lesion and refund lost structures to the dental element. This restorative procedure is challenging due to the location of the lesion close to the marginal gingiva, requiring the use of some kind of isolation to expose the marginal of the cavity and allow a good adhesive procedure.

Keywords: Non-carious cervical lesion; Composite resin; Restorations; Isolation techniques; Rubber dam.

SUMÁRIO

INTRODUCTION

Non-carious cervical lesions (NCCLs) are pathological processes of multifactorial etiology characterized by the loss of tooth structure in the cervical of the tooth not associated with the presence of caries.[1, 2] The formation and progression of NCCL occurs through the association of three main factors, attrition (wear and abrasion caused by the friction of substances); biocorrosion (chemical, biochemical and electrochemical degradation, caused by intrinsic and extrinsic habits) and the accumulation of strain (abfraction, parafunction and traumatic occlusion).[1] Clinically, these lesions present themselves in different geometries, ranging from light depressions to large wedges or rounded shapes; It may occur in one or several dental elements.[3] These cervical wear are routinely found in clinical practice, having a prevalence rate of up to 46.7% in adults and showing an increase proportional to population aging.[4]

The clinical management of NCCLs is still widely discussed and controversial, however, the success of the rehabilitation of these lesions, performing the restoration of lost structures, occlusal analysis and instruction to the patient regarding habits is noticeable.[5, 6] The replacement of lost dental tissue with a restorative material has been recommended as a way of protecting dentin hypersensitivity, preventing more severe wear and to reduce damage to biomechanical behavior.[5, 7, 8] However, it is important mentioning that the replacement of worn tooth structure by a restorative material does not treat the etiological factors that generate cervical wear.[7] Therefore, analyzing all intervention needs in the patient and treating the etiological factor are essential for the success of the restorative procedure, since the occlusal loading affects the material, due to strain accumulation on the restoration/dental tissue interface.[9, 10]

Several reports on different adhesives/restorative materials are used to restore non-carious cervical tooth loss.[11] Materials such as composite resin, glass ionomer cements and fluid resins are the most commonly used in restorative protocols.[12.13] However, the adhesive capacity, as well as the success rate and survival of these systems depends on dentin hydration, sclerotic dentin formation, material elasticity modulus, chemical degradation, hardness decrease, attrition, among other factors. Regardless of the region to be rehabilitated, these materials must present optical properties, stress distribution and deformation similar to those of lost dental tissues.[8, 14-16] Adhesive restorative materials are the most suitable for presenting better

aesthetics of the involved region and reducing hypersensitivity dentin.[5, 7] Therefore, composite resins for their physical and aesthetic properties are the choice material.[17]

NCCL restorations, or class V cavities, present some challenges regarding moisture control, access to subgingival margins and regularization of marginal adaptation.[18] In this context, the type of isolation considerably influences the long-term results for the treatment of NCCL, since adhesive materials are extremely sensitive to moisture.[19, 20] The best known methods of moisture control are absolute isolation, used with a rubber dam, and relative isolation, obtained through the use of cotton rolls. In both methods the saliva ejector should be associated.[21] Another method is modified isolation, where cotton rolls are positioned bilaterally in the vestibule, lateral to the superior labial frenum; and then eight perforations are made in the rubber dam, covering from pre-molar to pre-molar, which can be fixed with stops (a piece of the dam between the teeth) or clamps. In this way, leaving the rubber dam firm under the cotton rollers.[22] Some auxiliary devices in isolating the operative field can also be used, such as retraction cords and hemostatic agents.[18, 23]

In this context, the objective of this work is to demonstrate and discuss, through a series of clinical cases, the types of isolation techniques for non-carious cervical lesion composite resin restorations.

CASE SERIES

Patients involved voluntarily in the cases that will be described below received and signed the Informed Consent Form. The work was submitted to the Ethics Committee in Research with Human Beings of the Federal University of Uberlândia and is awaiting document analysis for later approval.

Case 1: Restoration of a non-carious cervical lesion using relative isolation

Patient passed by dental treatment at the Non-Carious Lesions Treatment Center at the Federal University of Uberlândia due to the presence of a cavity in the cervical region of element 14 and dentin hypersensitivity (DH) score 8 by the visual analogue scale (VAS) during the air blast test. The lesion had a rounded morfology, cervico-occlusal and mesio-distal dimension greater than 4 mm, cavo-superficial angle predominantly in enamel and the cavity end at the gingival level. There was no bleeding during probing, the dental element was restored with a resin composite with an increment and the score of DH was 0. The option for the isolation field for this case was trough gauze, cotton rolls and retraction cord in the gingival sulcus. The operative sequence is described in the figures 1-7.

Case 2: Restoration of a non-carious cervical lesion using modified isolation

A 27-year-old young adult patient searched dental treatment at the Non-Carious Injury Treatment Center of the Federal University of Uberlândia with complaint of pain when ingesting acidic and cold foods. When performing anamnesis and clinical examination, it was found occlusal interference, acidic diet, clenching teeth and brushing with excessive force. Patient was diagnosed with gingival recession, non-carious cervical lesions and dentinal hypersensitivity in several teeth, either alone or in combination. In order to ensure greater patient comfort, for the treatment sequence with a multiprofessional approach, teeth without cervical cavity were desensitized and element 14, which had HD level 5 and cavity, was restored with composite resin. The option for the isolation field for this case was trough modified isolation with an adapted rubber dam and retraction cord. After the restorations the DH turned score 0.The operative sequence is described in the figures 8-16.

Case 3: Restoration of a non-carious cervical lesion using absolute isolation

Patient underwent dental treatment at the Non-Carious Lesions Treatment Center of the Federal University of Uberlândia due to the presence of a cavity in the cervical region of the elements 14 and 15 and dentin hypersensitivity (HD) level 5 and 6, respectively, on the visual analogue scale (EVA) during the air blast test. The injury element 15 had larger dimensions in the cervico-occlusal direction compared to element 14. Both with cavo-surface angle predominantly in dentin and cavity end at the gingival level. During the restorative procedure, element 14 was restored first and then element 15, both with composite resin in a single increment. After the restorations the DH turned score 0. The option for the isolation field for this case was trough rubber. The operative sequence is described in the figures 17-22.

DISCUSSION

NCCL restorations, or class V cavities, present some difficulties regarding access to subgingival margins, regularization of marginal adaptation and moisture control.[18] Several studies have evaluated the influence of contaminants such as saliva, blood and crevicular fluid/gingival fluid on the properties of composite resins, mainly on the adhesion of these materials to the tooth surface.[24] Salivary contamination during the execution of the adhesive protocol can cause some problems, such as the reduction of adhesive strength and the increase of microleakage. These problems reduce the adaptation of the restorative material to the adhesive, thus leading to a lower longevity of resin restorations.[24, 25]

Contamination with blood has been shown to be more harmful to the adhesive interface when compared to salivary contamination, due to the presence of macromolecules (such as platelets and fibrinogen), which are capable of forming a film on the surface of the tooth.[26] However, saliva is the most recurrent means of contamination during restorative procedures.[27] Another factor that must be considered during the restoration of NCCLs is the presence of crevicular fluid., which, like saliva, influences the reduction of adhesive forces and the increase of microleakage.[24-26, 28]

Considering that the success of the adhesion of restorative materials depends on the control of the flow of fluids from the oral cavity, the access of the adhesive system and the amount of interface of the restoration situated in dentin, isolation of the operative field is necessary.[14, 18, 29] Due to the location and progression of NCCLs to more subgingival regions, the act of isolating becomes a challenge and ends up directly interfering with the execution of the technique, patient satisfaction and the finishing and polishing of the restorations.[18]

Rubber dam insulation reduces the risk of cross-infection, provides a cleaner/aseptic field, better visibility, facilitates exposure of the cervical end, and generates less excess restorative material in the cervical region of the tooth.[19-21] Despite this, 63% of dentists do not use absolute isolation in their clinical routine.[21] Among the reasons reported is the higher skill level required by the technique, patient discomfort and longer clinical time required.[30] Thus, resulting in higher rates of marginal maladaptation due to the difficulty of handling.[29] Furthermore, the use of

metal retainers (clamps) in regions with narrow keratinized gingival width may contribute to a higher incidence of gingival recession immediately after isolation.[31]

The use of cotton rolls and retraction cord in relative isolation in non-carious cervical restorations has not shown differences related to retention, patient preference and procedure execution, when compared to absolute isolation.[31] However, it requires greater attention and control of the dental team and presents a higher incidence of small marginal defects in view of the isolation.absolute.[31] The association of the retractor wires allows better visualization and access to the cervical end, in addition to being able to reduce the flow of crevicular fluid, improving moisture control and consequently giving the restoration greater longevity.[23, 29, 31] However, the insertion of the retractor wire can bring discomfort to the patient and cause lacerations and bleeding of the gingival tissues. These factors are associated with greater chances of gingival recession.[32, 34]

Associated with the use of retractor wires, hemostatic agents such as epinephrine, aluminum chloride, potassium aluminum sulfate and aluminum sulfate have been used in order to provide greater control of fluids and tissue displacement, avoiding contamination of blood, saliva and soft tissue iatrogens.[23] However, studies show that hemostatic agents can remain on the dental surface and end up resulting in a significant decrease in the bond strength of the adhesive material to the dentin.[33] Astringent agents in the form of a paste and gel based on 15% aluminum chloride have also been used. These agents have a low risk for inflammation, are easy to apply, and are generally more comfortable for the patient. However, its introduction can generate residues inside the groove and interactions with other restorative and impression materials.[34]

Another alternative is modified isolation, which consists of placing cotton rolls at the bottom of the vestibule bilaterally, followed by a rubber dam. It covers the premolars on both sides, and can be fixed with clamps (numbers 206 to 209) or stops (pieces of rubber dam) positioned between the teeth; allowing the dam to sit tight below the cotton rolls. This isolation technique makes it possible to work with good exposure of the gingival margins and prevents contamination of saliva and blood. And when associated with the retractor wire, it allows better control of the crevicular fluid exudate. Unlike conventional absolute insulation, the restorative material does not come into contact with the rubber dam. Thus, facilitating the insertion and finishing of the composite resin,

especially in the gingival embrasures. However, as with relative isolation, we have the highest incidence of excesses and, due to the limitation of the technique itself, its use is contraindicated for isolation of posterior teeth or for more than eight dental elements.[22]

The success and longevity of composite resin restorations in LCNCs are dependent on proper material handling and isolation of the operative field.[31] However, the skill of the dentist in performing clinical procedures, as well as technical and scientific knowledge also influence. Failures during the fabrication of restorations, such as improper application of dental materials, lack of attention and care and insufficient light curing time interfere with the properties of the materials, increase the risk of infiltration, marginal misfit and change the final esthetics.[35.36]

CONCLUSION

Considering the limitations of the present study, it can be concluded that the performance and control of fluids and contaminants in NCCLs/class V restorations are challenging. Isolation methods have their indications, advantages and disadvantages and it is up to the dentist to choose the best option for each situation. In the dental market we find auxiliary devices, which can be useful to the operator and the dental team. The success and longevity of restorations also depend on the skill and technical and scientific knowledge of the person performing it.

REFERENCES

(1) Grippo JO, Simring M, Coleman TA. Abfraction, abrasion, biocorrosion, and the enigma of noncarious cervical lesions: a 20-year perspective. J Esthet Restor Dent. 2012;24(1):10-23. https://doi.org/10.1111/j.1708-8240.2011.00487.x

(2) Sugita I, Nakashima S, Ikeda A, Burrow MF, Nikaido T, Kubo S, et al. A pilot study to assess the morphology and progression of non-carious cervical lesions. J Dent. 2017;57:51-6. https://doi.org/10.1016/j.jdent.2016.12.004

(3) Walter C, Kress E, Götz H, Taylor K, Willershausen I, Zampelis A. The anatomy of non-carious cervical lesions. Clin Oral Investig. 2014;18(1):139-46. https://doi.org/10.1007/s00784-013-0960-0

(4) Teixeira DNR, Thomas RZ, Soares PV, Cune MS, Gresnigt MMM, Slot DE. Prevalence of noncarious cervical lesions among adults: A systematic review. J Dent. 2020;95:103285. https://doi.org/10.1016/j.jdent.2020.103285

(5) Kim SY, Lee KW, Seong SR, Lee MA, Lee IB, Son HH, et al. Two-year clinical effectiveness of adhesives and retention form on resin composite restorations of non-carious cervical lesions. Oper Dent. 2009;34(5):507-15. https://doi.org/10.2341/08-006C

(6) Oz FD, Ergin E, Canatan S. Twenty-four-month clinical performance of different universal adhesives in etch-and-rinse, selective etching and self-etch application modes in NCCL - a randomized controlled clinical trial. J Appl Oral Sci. 2019;27:e20180358. https://doi.org/10.1590/1678-7757-2018-0358

(7) Michael JA, Townsend GC, Greenwood LF, Kaidonis JA. Abfraction: separating fact from fiction. Aust Dent J. 2009;54(1):2-8. https://doi.org/10.1111/j.18347819.2008.01080.x

(8) Soares PV, Santos-Filho PC, Soares CJ, Faria VL, Naves MF, Michael JA, et al. Non-carious cervical lesions: influence of morphology and load type on biomechanical behaviour of maxillary incisors. Aust Dent J. 2013;58(3):306-14. https://doi.org/10.1111/adj.12084

(9) Oz FD, Kutuk ZB, Ozturk C, Soleimani R, Gurgan S. An 18-month clinical evaluation of three different universal adhesives used with a universal flowable composite resin in the restoration of non-carious cervical lesions. Clin Oral Investig. 2019;23(3):1443-52. https://doi.org/10.1007/s00784-018-2571-2

(10) Ichim I, Schmidlin PR, Kieser JA, Swain MV. Mechanical evaluation of cervical glass-ionomer restorations: 3D finite element study. J Dent. 2007;35(1):28-35. https://doi.org/10.1016/j.jdent.2006.04.003

(11) Peumans M, De Munck J, Mine A, Van Meerbeek B. Clinical effectiveness of contemporary adhesives for the restoration of non-carious cervical lesions. A systematic review. Dent Mater. 2014;30(10):1089-103. https://doi.org/10.1016/j.dental.2014.07.007

(12) Bezerra IM, Brito ACM, de Sousa SA, Santiago BM, Cavalcanti YW, de Almeida LFD. Glass ionomer cements compared with composite resin in restoration of noncarious cervical lesions: A systematic review and meta-analysis. Heliyon. 2020;6(5):e03969. https://doi.org/10.1016/j.heliyon.2020.e03969

(13) Shinohara MS, Carvalho PRM, Neves Marcon L, Gonçalves DFM, Ramos FSE, Fagundes TC. Randomized clinical trial of different adhesion strategies in noncarious cervical lesion restorations: 1-year follow-up. Quintessence Int. 2020;51(5):352-63. https://doi.org/10.3290/j.qi.a44367

(14) Chowdhury A, Saikaew P, Matsumoto M, Sano H, Carvalho RM. Gradual dehydration affects the mechanical properties and bonding outcome of adhesives to dentin. Dent Mater J. 2019;38(3):361-7. https://doi.org/10.4012/dmj.2018-142

(15) de Paula AB, de Fúcio SB, Alonso RC, Ambrosano GM, Puppin-Rontani RM. Influence of chemical degradation on the surface properties of nano restorative materials. Oper Dent. 2014;39(3):E109-17. https://doi.org/10.2341/12-340

(16) da Silva EM, de Sá Rodrigues CU, Dias DA, da Silva S, Amaral CM, Guimarães JG. Effect of toothbrushing-mouthrinse-cycling on surface roughness and topography of nanofilled, microfilled, and microhybrid resin composites. Oper Dent. 2014;39(5):521-9. https://doi.org/10.2341/13-199-L

(17) Bicalho AA, Pereira RD, Zanatta RF, Franco SD, Tantbirojn D, Versluis A, et al. Incremental filling technique and composite material--part I: cuspal deformation, bond strength, and physical properties. Oper Dent. 2014;39(2):E71-82. https://doi.org/10.2341/12-441-L

(18) Perez CR. Alternative technique for class V resin composite restorations with minimum finishing/polishing procedures. Oper Dent. 2010;35(3):375-9. https://doi.org/10.2341/09-310-TR

(19) Mahn E, Rousson V, Heintze S. Meta-Analysis of the Influence of Bonding Parameters on the Clinical Outcome of Tooth-colored Cervical Restorations. The journal of adhesive dentistry. 2015;17:391-403. https://doi.org/10.3290/j.jad.a35008

(20) Pedrosa FAS, Silveira RR, Yamauti M, Castro CDL, Freitas ABDA. Rubber Dam: Use in Private Clinics in Belo Horizonte, MG,Brazil. Brazilian Research in Pediatric Dentistry and IntegratedClinic; 2011. p. 443-9.

(21) Gilbert GH, Litaker MS, Pihlstrom DJ, Amundson CW, Gordan VV. Rubber dam use during routine operative dentistry procedures: findings from the Dental PBRN. Oper Dent. 2010;35(5):491-9. https://doi.org/10.2341/09-287C

(22) Zeni F, Ilkiu RE, Schmitt J, Martarello C. Isolamento absoluto modificado: alternativapara trabalhos em dentes anteriores. Ação Odonto. 2014;2(3):18.

(23) Shrivastava KJ, Bhoyar A, Agarwal S, Shrivastava S, Parlani S, Murthy V. Comparative clinical efficacy evaluation of three gingival displacement systems. J Nat Sci Biol Med. 2015;6(Suppl 1):S53-7. https://doi.org/10.4103/0976-9668.166082

(24) Eiriksson SO, Pereira PN, Swift EJ, Jr., Heymann HO, Sigurdsson A. Effects of saliva contamination on resin-resin bond strength. Dent Mater. 2004;20(1):37-44. https://doi.org/10.1016/S0109-5641(03)00066-6

(25) Yoo HM, Oh TS, Pereira PN. Effect of saliva contamination on the microshear bond strength of one-step self-etching adhesive systems to dentin. Oper Dent. 2006;31(1):127-34. https://doi.org/10.2341/04-206

(26) Prasad M, Mohamed S, Nayak K, Shetty SK, Talapaneni AK. Effect of moisture, saliva, and blood contamination on the shear bond strength of brackets bonded with a conventional bonding system and self-etched bonding system. J Nat Sci Biol Med. 2014;5(1):123-9. https://doi.org/10.4103/0976-9668.127305

(27) Khanehmasjedi M, Naseri MA, Khanehmasjedi S, Basir L. Comparative evaluation of shear bond strength of metallic brackets bonded with two different bonding agents under dry conditions and with saliva contamination. J Chin Med Assoc. 2017;80(2):103-8. https://doi.org/10.1016/j.jcma.2016.10.003

(28) Griffiths GS. Formation, collection and significance of gingival crevice fluid. Periodontol 2000. 2003;31:32-42. https://doi.org/10.1034/j.1600-0757.2003.03103.x

(29) Perez Cdos R, Gonzalez MR, Prado NA, de Miranda MS, Macêdo Mde A, Fernandes BM. Restoration of noncarious cervical lesions: when, why, and how. Int J Dent. 2012;2012:687058. https://doi.org/10.1155/2012/687058

(30) Hill EE, Rubel BS. Do dental educators need to improve their approach to teaching rubber dam use? J Dent Educ. 2008;72(10):1177-81. https://doi.org/10.1002/j.0022-0337.2008.72.10.tb04596.x

(31) Loguercio AD, Luque-Martinez I, Lisboa AH, Higashi C, Queiroz VA, Rego RO, et al. Influence of Isolation Method of the Operative Field on Gingival Damage, Patients' Preference, and Restoration Retention in Noncarious Cervical Lesions. Oper Dent. 2015;40(6):581-93. https://doi.org/10.2341/14-089-C

(32) Huang C, Somar M, Li K, Mohadeb JVN. Efficiency of Cordless Versus Cord Techniques of Gingival Retraction: A Systematic Review. J Prosthodont. 2017;26(3):177-85. https://doi.org/10.1111/jopr.12352

(33) Araújo I, Prado C, Raposo L, Soares C, Zanatta R, Torres C, et al. Influence of Hemostatic Solution on Bond Strength and Physicochemical Properties of Resin Cement. Brazilian Dental Journal. 2017;28:624-31. https://doi.org/10.1590/0103-6440201701481

(34) Gupta A, Prithviraj DR, Gupta D, Shruti DP. Clinical evaluation of three new gingival retraction systems: a research report. J Indian Prosthodont Soc. 2013;13(1):36-42. https://doi.org/10.1007/s13191-012-0140-y

(35) Silva Neto JMA, Silva LEE, Souza CCB, Pereira NEC, Mendonça ICG. Use of compound resins in previous teeth. Revista Eletrônica Acervo Saúde2021. p. 6583-. https://doi.org/10.25248/reas.e6583.2021

(36) Dionysopoulos D, Gerasimidou O. Wear of contemporary dental composite resin restorations: a literature review. Restor Dent Endod. 2021;46(2):e18. https://doi.org/10.5395/rde.2021.46.e18

APÊNDICE – FIGURAS CASO 1 (ISOLAMENTO RELATIVO)

Figure 1: Initial appearance of tooth 14 with NCCL, showing cervical wear with indication of restoration. After the air blast test, the patient reported 8 score of DH on the VAS. Due to the wear morphology, it was not necessary to perform a bevel to mask the restorative interface.

Figure 2: Prophylaxis performed with pumice stone and 2% chlorhexidine.

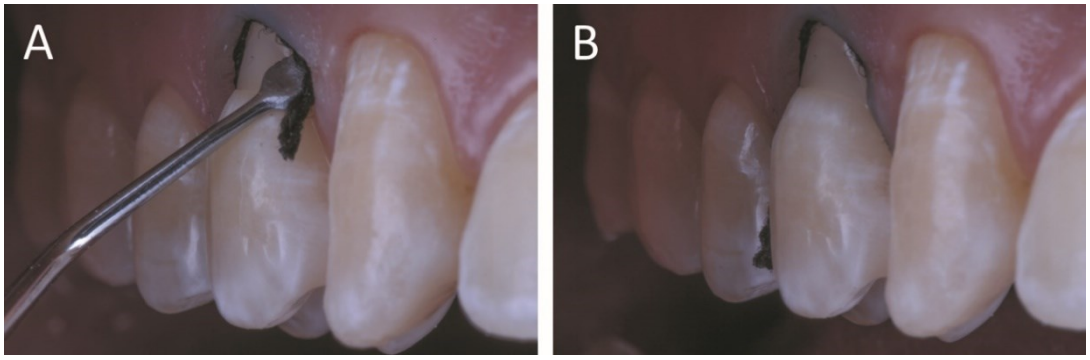

Figure 3 (A - B): To start the restorative procedure the relative isolation was performed with cotton roll, lint, retraction cord #000 (Ultrapak, Ultradent) inserted with the spatula (Fischer Ultrapak 171 small, Ultradent) in the gingival sulcus (A) and constant suction with saliva ejector. Appearance after insertion of the retraction cord (B).

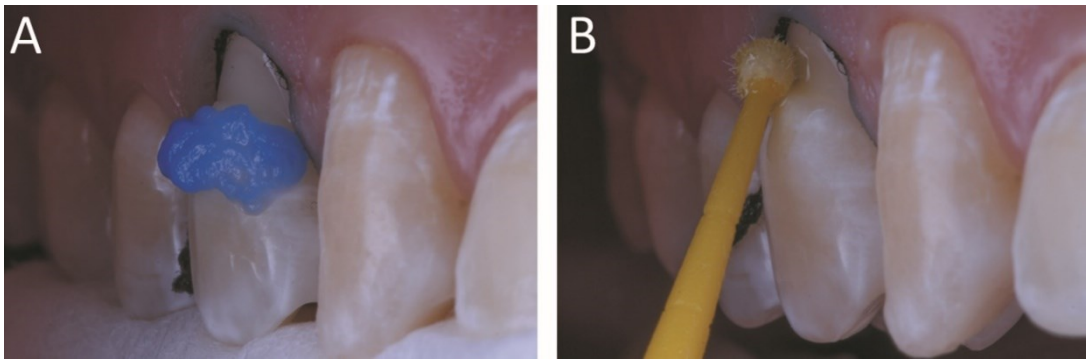

Figure 4 (A - B): Selective enamel etching (A) with 37% phosphoric acid (Ultraetch, Ultradent), then abundant washing and moisture control were performed. Adhesive application (B) universal (Single Bond Universal, 3M ESPE) in enamel and dentin with the microbrush (KG Brush, KG Sorensen). After the adhesionn, light cured procedure was perfomed (20 seconds) with the curing light (Valo, Ultradent).

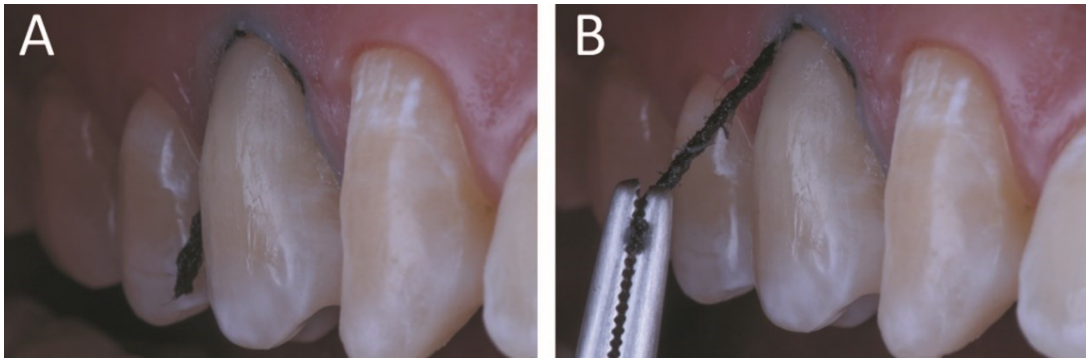

Figure 5 (A - B): Restorative material inserted in a single increment of resin composite (Filtek Universal, A2, 3M ESPE) in the cavity (A). Removing the retraction cord after 40 seconds of light curing procedure (B).

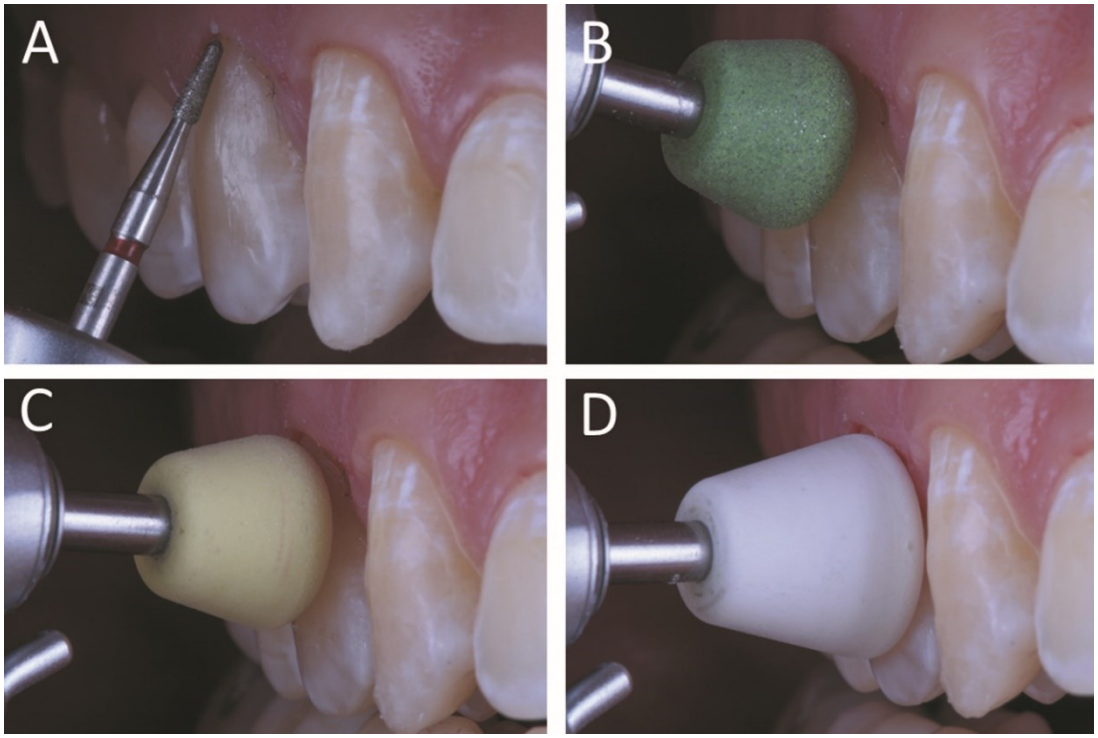

Figure 6 (A - D): Finishing and removing cervical excess (A) with diamond bur #1190F (KG Sorensen, Cotia, SP, Brazil). Polishing is performed with rubbers silicone abrasives (Jiffy, Ultradent) coarse (B) fine (C) and extrafine (D).

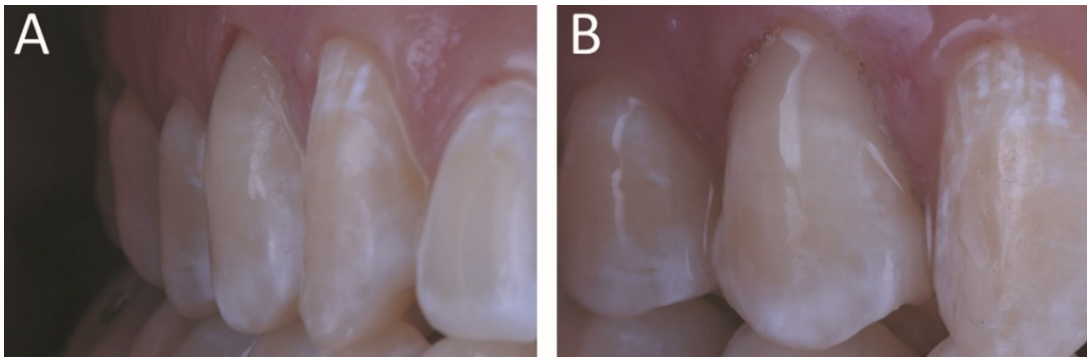

Figure 7 (A - B): Immediate final appearance of the composite resin restoration on tooth 14. The air jet DH test was performed after the procedure, and the patient did not report any discomfort (VAS = 0).

APÊNDICE – FIGURAS CASO 2 (ISOLAMENTO MODIFICADO)

Figure 8: Initial appearance of tooth 14 with LCNC, showing cervical wear with indication for restoration. After the air blast test, the patient reported index 6 (moderate) dentin hypersensitivity (HD) by the visual analogue scale (VAS).

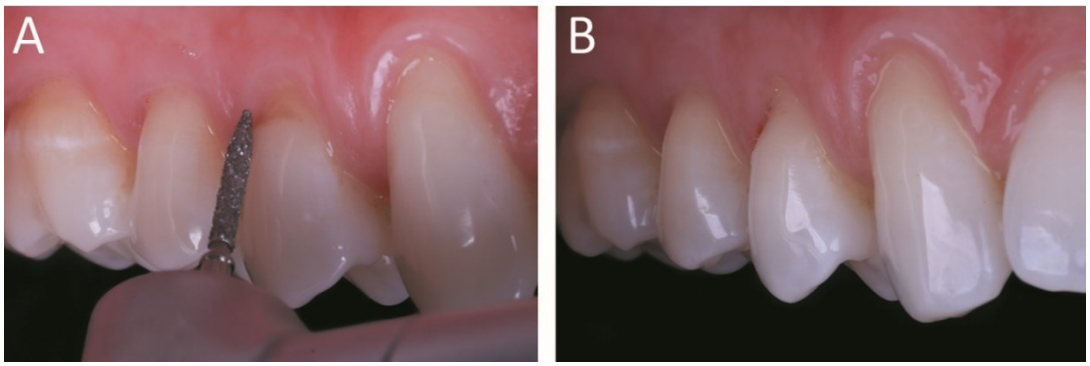

Figure 9 (A - B): Considering the aesthetic involvement of the cervical/middle third of the upper premolar, and the presence of a well-defined cavo-superficial occlusal angle, it was decided to perform a long bevel (approximately 4 mm) with diamond bur (KG Sorensen) to mask the restorative interface (A). Appearance after long bevel made (B).

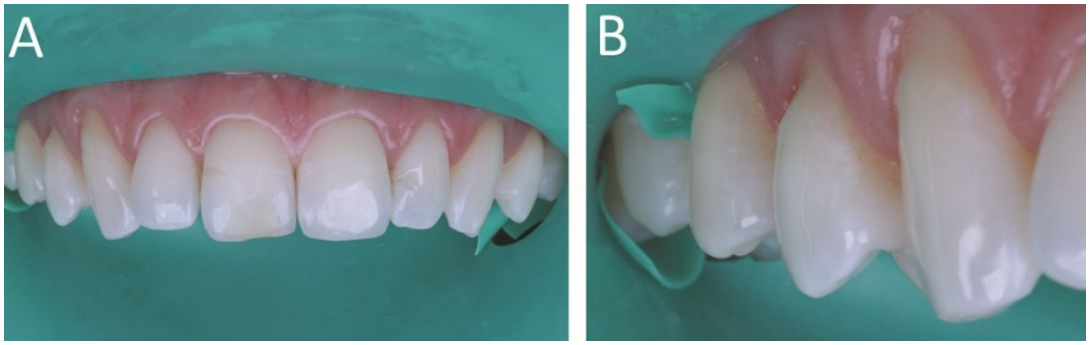

Figure 10 (A - B): After prophylaxis, the operative field was relatively isolated with a rubber dam cut to expose the region to be treated, also known as “modified isolation” (A). Aspect of the region of interest exposed after isolation (B).

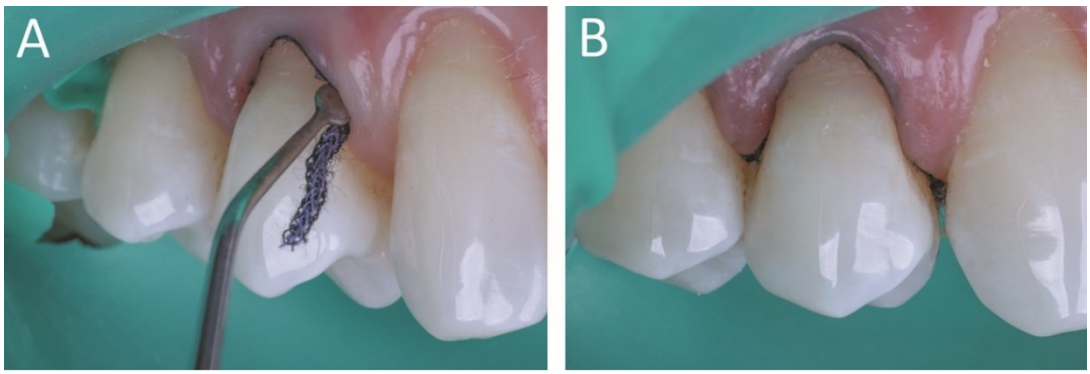

Figure 11 (A - B): To help control crevicular fluid moisture and improve visualization of the cavity end, retraction cord #000 (Ultrapack, Ultradent) was inserted (A) with the spatula (Fisher 171, Ultradent). Retraction cord inserted into the gingival sulcus (B).

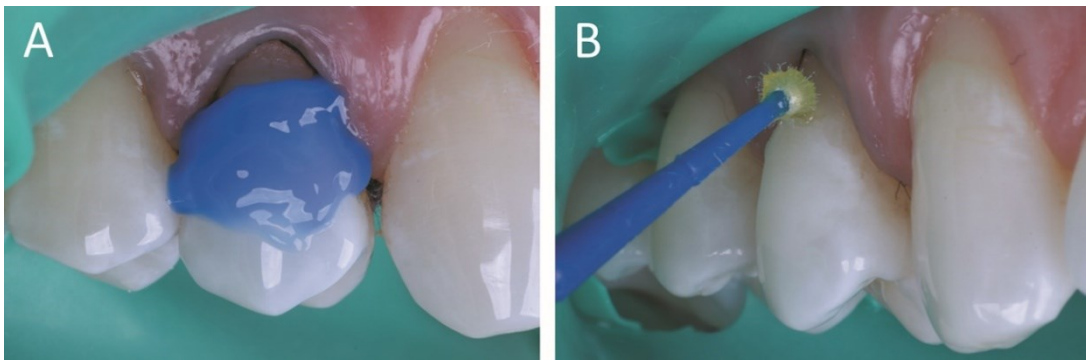

Figure 12 (A - B): Selectively etch enamel with 35% phosphoric acid (Ultra Etch, Ultradent). It is possible that, even using a phosphoric acid with excellent thixotropy, there is “accidental” conditioning of part of the dentin (A). Application of universal adhesive (Single Bond Universal, 3M). Considering that even unintentionally there were areas of conditioned dentin, this is the best option (B).

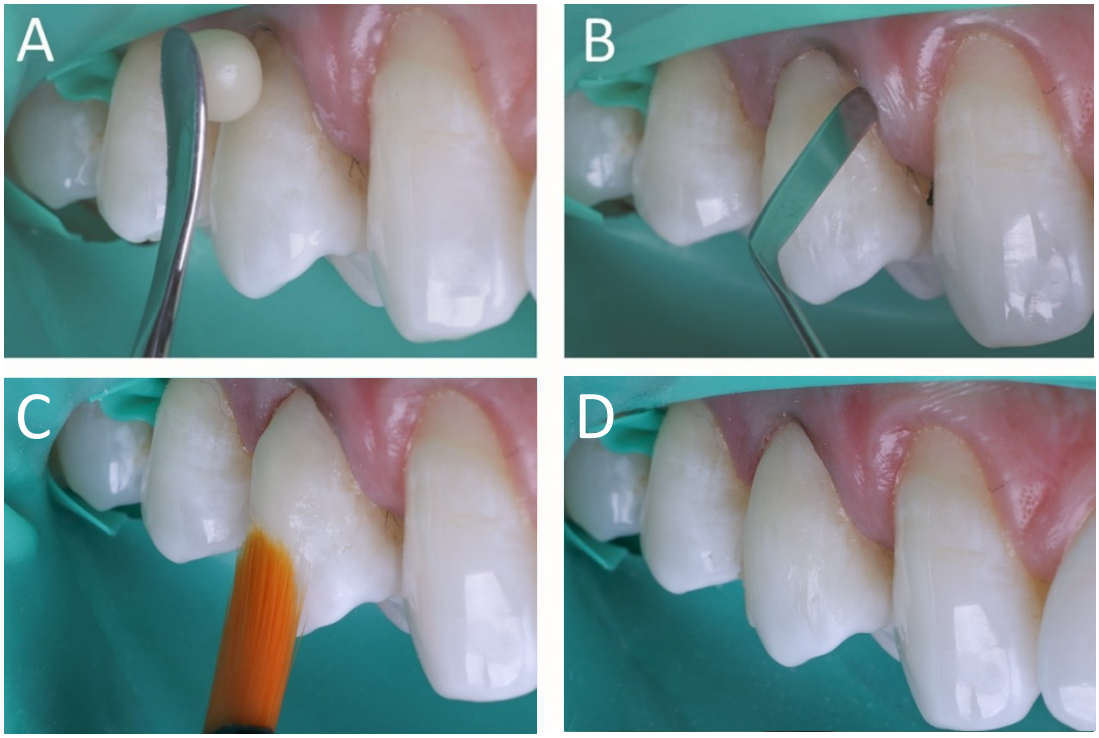

Figure 13 (A - D): After light curing with a device configured to emit 1,000mW/cm2 (Valo, Ultradent), a single increment of composite resin (A) of a simplified A3 hue/chroma system (Filtek Universal, 3M) was inserted with a spatula (Almore Nº 1, Quinelate). To avoid greater cervical excesses, a very thin spatula (LM-Arte Applica, by Quinelato) should be used very gently and in light “saw” movements, starting in the center of the cervical to the proximal (B). A brush can be used to finish the sculpture (C). Appearance after light curing (D).

Figure 14: Removing the retraction cord along the long axis of the tooth.

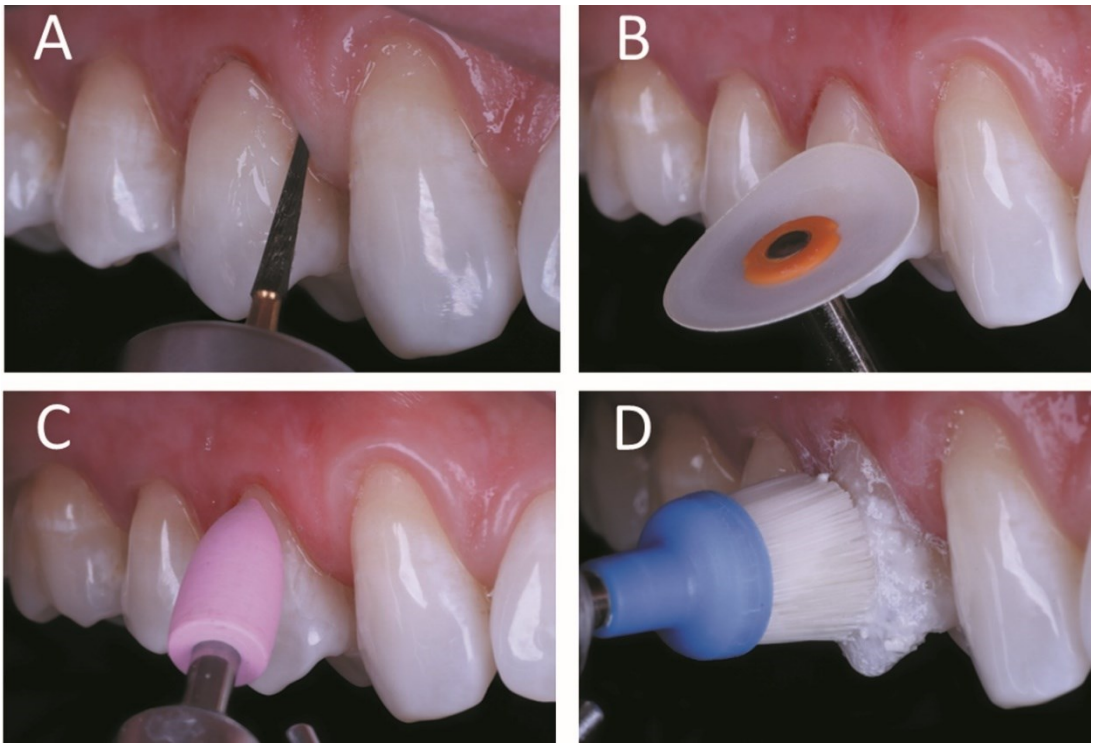

Figure 15 (A - D): Multilaminated drill for removal of excesses close to the periodontal tissue (A). Composite resin finishing sequence with abrasive discs (Optidisc, Kerr) (B

– D); abrasive rubbers (GCI Kit, Kenda) (E and F); and polishing paste (1 and 0.5 micron Diamond Polish Mint, Ultradent) (G).

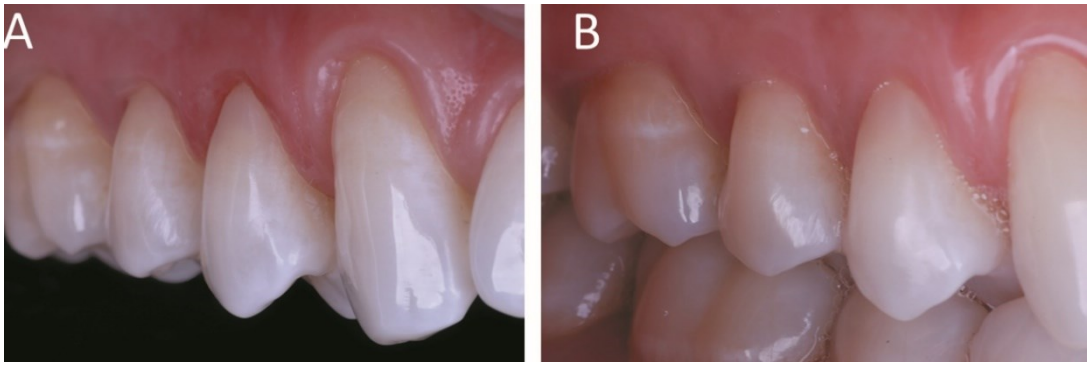

Figure 16 (A - B): Immediate appearance after polishing. Immediately, the dentin hypersensitivity test was performed and the patient reported absence of pain (VAS = 0). Final appearance 15 days after restoration of tooth 14 and desensitization of tooth 16 and 15. The patient reported no pain, feeling more comfortable to continue the treatment of the etiological factors of non-carious lesions and other procedures, such as root coverage, occlusal adjustment, orientation of diet, nutritional guidance, among others. Appearance after return of 18 days, noting good gingival health in the cervical region (B).

APÊNDICE – FIGURAS CASO 3 (ISOLAMENTO ABSOLUTO)

Figure 17: Initial appearance of tooth 14 and 15 with NCCL, showing cervical wear with indication of restoration.

Figure 18: In this case, absolute isolation was performed with a rubber dam. As can be seen, the metal clamp (B4) is positioned on the cervical of tooth 14, which was restored first, and then the clamp was positioned on tooth 15 to follow the steps of the restoration. When we opted for this type of isolation, it is recommended that the clamp is positioned on the tooth that will be restored, because this way, this retractor clamp will be able to push away the gingival tissue in the cervical region, where non-carious lesion is located.

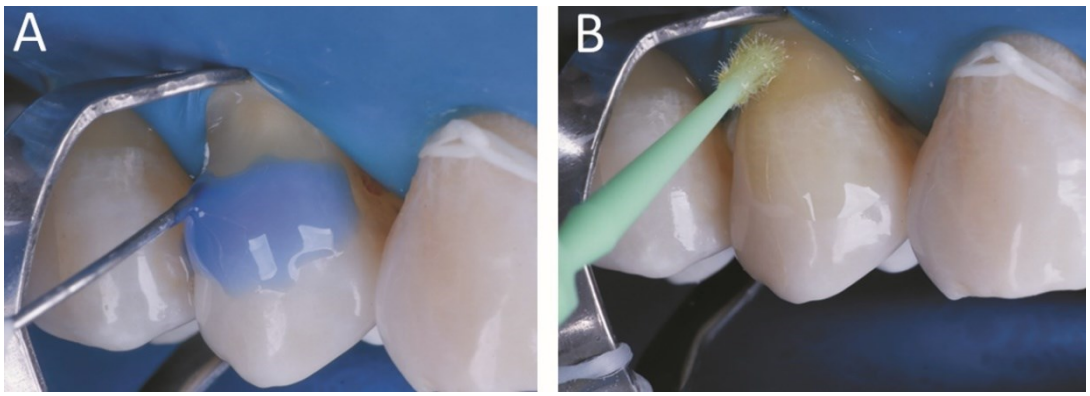

Figure 19 (A - B): Selective enamel etching (A) with 37% phosphoric acid (Ultraetch, Ultradent), then abundant washing and moisture control were performed. Application of universal adhesive (Single Bond Universal, 3M ESPE) with the microbrush (Points, SDI) (B).

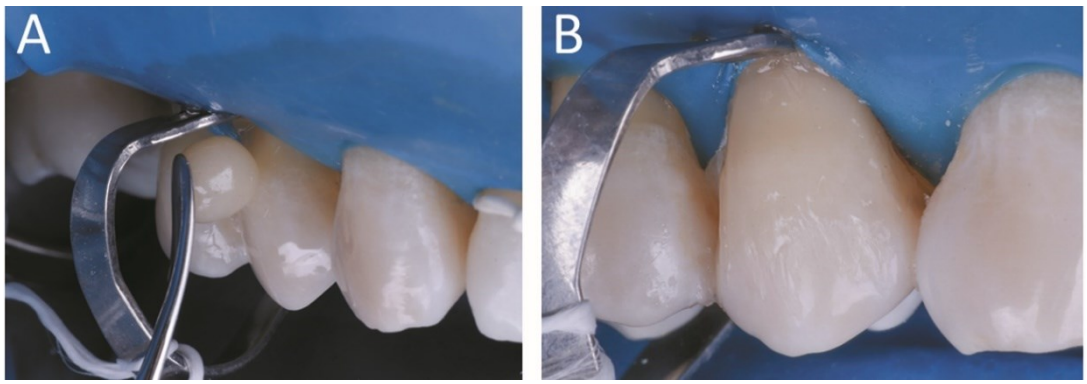

Figure 20 (A - B): Single increment restorative step (A) composite resin (Filtek Universal, 3M ESPE) using the spatula (Almore No. 1, Quinelato). Appearance after finish the anatomy and brush refinement before light curing (B).

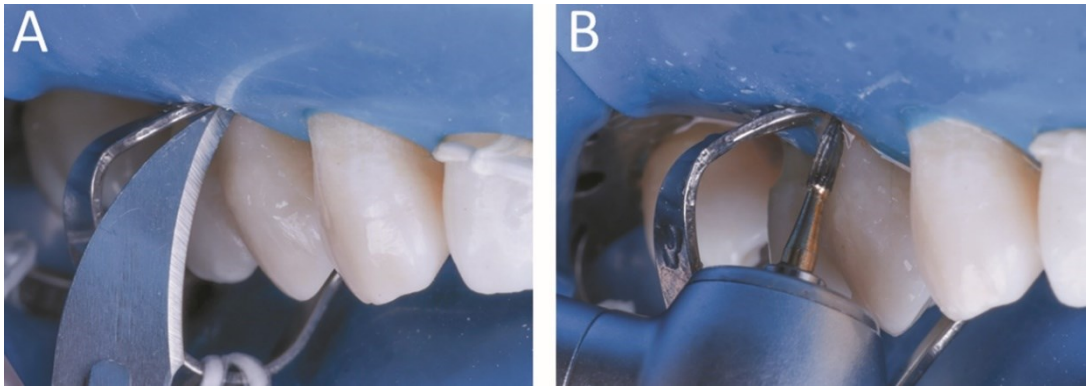

Figure 21 (A - B): Removal of cervical excess after light curing with the aid of a scalpel blade (A) and a multilaminated drill (B).

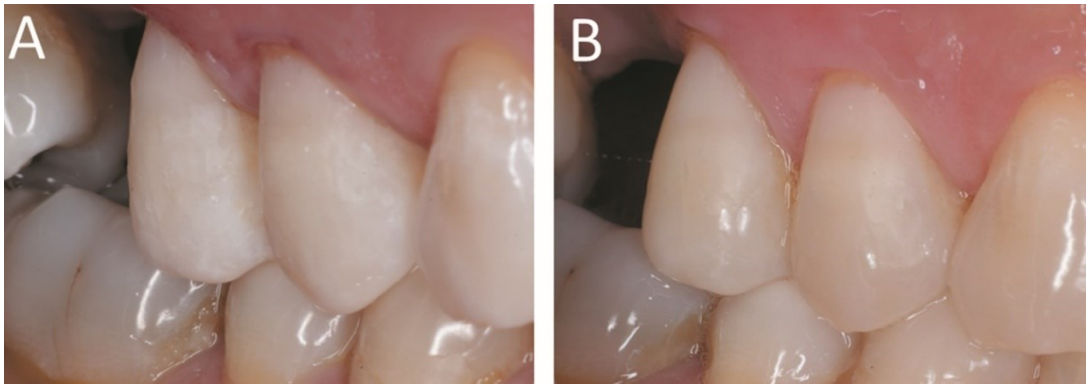

Figure 22 (A - B): Final appearance after removing the absolute isolation and polishing the restorations on both elements (A). Aspect after return of 2 months (B).

ANEXO A - SUBMISSÃO DA SÉRIE DE CASOS AO CEP/UFU

DADOS DA VERSÃO DO PROJETO DE PESQUISA

Título da Pesquisa: Comparação de técnicas para controlar a umidade da saliva e sangue para restaurações dentes desgastados
Pesquisador Responsável: Álexandre Coelho Machado
Área Temática:
Versão: 1
CAAE:
Submetido em: 17/11/2022
Instituição Proponente: Escola Técnica de Saúde
Situação da Versão do Projeto: Pendência Documental Emitida pelo CEP
Localização atual da Versão do Projeto: Pesquisador Responsável
Patrocinador Principal: Financiamento Próprio

ANEXO B - TERMO DE CONSENTIMENTO LIVRE E ESCLARECIDO UTILIZADO NESSE TRABALHO

TERMO DE CONSENTIMENTO LIVRE E ESCLARECIDO

Você está sendo convidado (a) a participar da pesquisa intitulada "Comparação de técnicas de isolamento para restaurações de lesões cervicais não cariosas em resina composta", sob a responsabilidade dos pesquisadores Prof. Dr. Alexandre Coelho Machado e discente Pedro Guimarães Mendes, da Escola Técnica de Saúde da Universidade Federal de Uberlândia.

Nesta pesquisa nós estamos buscando analisar qual isolamento, ou seja, qual forma de controlar a umidade e contaminantes no momento de restaurar a cavidade de um dente é mais benéfica. E para isso, iremos utilizar os relatos de casos clínicos para descrever e discutir as diferentes técnicas.

O Termo/Registro de Consentimento Livre e Esclarecido está sendo obtido pelo pesquisador Pedro Guimarães Mendes no Centro de tratamento de Lesões Cervicais Não-cariosas na Escola Técnica de Saúde Bucal (ESTES) da Universidade Federal de Uberlândia. Você tem o tempo que for necessário para decidir se quer ou não participar da pesquisa (conforme item IV da Resolução nº 466/2012 ou Capítulo. III da Resolução nº 510/2016).

Na sua participação, você autoriza a consulta e utilização dos dados clínicos registrados no prontuário, além da utilização das fotografias odontológicas realizadas durante o atendimento. O pesquisador responsável atenderá as orientações das Resoluções nº 466/2012, Capítulo XI, Item XI.2: f e nº 510/2016, Capítulo VI, Art. 28: IV - manter os dados da pesquisa em arquivo, físico ou digital, sob sua guarda e responsabilidade, por um período mínimo de 5 (cinco) anos após o término da pesquisa.

Em nenhum momento você será identificado. Os resultados da pesquisa serão publicados e ainda assim a sua identidade será preservada. É compromisso do pesquisador responsável a divulgação dos resultados da pesquisa, em formato acessível ao grupo ou população que foi pesquisada (Resolução CNS nº 510 de 2016, Artigo 3º, Inciso IV).

Você não terá nenhum gasto e nem ganho financeiro por participar na pesquisa.

Havendo algum dano decorrente da pesquisa, você terá direito a solicitar indenização através das vias judiciais (Código Civil, Lei 10.406/2002, Artigos 927 a 954 e Resolução CNS nº 510 de 2016, Artigo 19).

Os riscos consistem em identificação do sujeito, o que contraria a Resolução 466/12, porém a equipe executora se compromete em não revelar em nenhum momento do estudo a identidade dos pacientes e assim, serão utilizados códigos para minimizar este risco. Os benefícios serão verificar e discutir a influência do tipo de técnica de isolamento utilizado ao restaurar uma cavidade que está próximo a gengiva. Os resultados poderão ajudar o cirurgião dentista a escolher a melhor técnica de acordo com cada situação, gerando uma boa qualidade da restauração nos pacientes tratados e, e consequentemente aumentar a longevidade desse procedimento.

Você é livre para deixar de participar da pesquisa a qualquer momento sem qualquer prejuízo ou coação. Até o momento da divulgação dos resultados, você também é livre para solicitar a retirada dos seus dados da pesquisa.

Uma via original deste Termo de Consentimento Livre e Esclarecido ficará com você, assinada e rubricada pelos pesquisadores.

Em caso de qualquer dúvida ou reclamação a respeito da pesquisa, você poderá entrar em contato com Alexandre Coelho Machado, no telefone (34) 3225-8462 ou na Escola Técnica de Saúde, no endereço Campus Umuarama - Bloco 4k - Sala 136 Av. Amazonas - s/n - Bairro Umuarama, Uberlândia/MG. Para obter orientações quanto aos direitos dos participantes de pesquisa acesse a cartilha no link:

Rubrica do Participante _____ Rubrica do Pesquisador _____

1/2

https://conselho.saude.gov.br/images/comissoes/conep/documentos/Cartilha_Direitos_Eticos_2020.pdf.

Você poderá também entrar em contato com o Comitê de Ética na Pesquisa com Seres Humanos – CEP, da Universidade Federal de Uberlândia, localizado na Av. João Naves de Ávila, nº 2121, bloco A, sala 224, *campus* Santa Mônica – Uberlândia/MG, 38408-100; pelo telefone (34) 3239-4131 ou pelo e-mail **cep@propp.ufu.br**. O CEP/UFU é um colegiado independente criado para defender os interesses dos participantes das pesquisas em sua integridade e dignidade e para contribuir para o desenvolvimento da pesquisa dentro de padrões éticos conforme resoluções do Conselho Nacional de Saúde.

Uberlândia, ... de ..... de 20.....

_____

Assinatura do(s) pesquisador(es)

Eu aceito participar do projeto citado acima, voluntariamente, após ter sido devidamente esclarecido.

_____

Assinatura do participante de pesquisa

_____ _____

Rubrica do Participante Rubrica do Pesquisador

ANEXO C – TRABALHO SUBMETIDO AO JOURNAL OF ESTHETIC AND RESTORATIVE DENTRISTRY (JERD)

18-Nov-2022

Dear Dr. Machado:

Your manuscript entitled "COMPARISON OF ISOLATION TECHNIQUES FOR NON-CARIOUS CERVICAL LESION COMPOSITE RESIN RESTORATIONS" by Machado, Alexandre; Pires, Mariana Fernandes; Mendes, Pedro Guimarães; Soares, Christian de Almeida; Cardoso, Igor Oliveiros; Vilela, Ana Laura; Filho, Paulo César de Freitas Santos, has been successfully submitted online and is presently being given full consideration for publication in Journal of Esthetic and Restorative Dentistry.

Co-authors: Please contact the Editorial Office as soon as possible if you disagree with being listed as a co-author for this manuscript.

Your manuscript ID is JERD-CAR-11-22-028.

Our journal is currently transitioning to Wiley's Research Exchange submission portal. If you submitted this manuscript through our Research Exchange site, you can view the status of your manuscript by logging into the submission site at https://wiley.atyponrex.com/journal/JERD . If you submitted this manuscript through ScholarOne, you can view the status of your manuscript by checking your Author Center after logging in to https://mc.manuscriptcentral.com/jerd .

Thank you for submitting your manuscript to Journal of Esthetic and Restorative Dentistry.

Sincerely,
Journal of Esthetic and Restorative Dentistry Editorial Office

ANEXO D – DIRETRIZES AOS AUTORES - JOURNAL OF ESTHETIC AND RESTORATIVE DENTRISTRY (JERD)

Author Guidelines

Journal of Esthetic and Restorative Dentistry now offers Free Format submission for a simplified and streamlined submission process; More details here

EDITORIAL OFFICE CONTACT INFORMATION

Editor-in-Chief

Dr. Rade D. Paravina
Department of Restorative Dentistry and Prosthodontics
University of Texas Health Science Center at Houston
School of Dentistry
Houston, TX

Managing Editor
Michelle Martire – JERDjournal@wiley.com

HOW TO SUBMIT

New submissions should be made via the Research Exchange submission portal https://wiley.atyponrex.com/journal/JERD. Should your manuscript proceed to the revision stage, you will be directed to make your revisions via the same submission portal. You may check the status of your submission at anytime by logging on to submission.wiley.com and clicking the "My Submissions" button. For technical help with the submission system, please review our FAQs or contact submissionhelp@wiley.com.

FORMATTING YOUR SUBMISSION

Manuscript Types Accepted

Original Research Articles are related to laboratory research or clinical research.

Clinical Technique Articles describe significant achievements and improvements in clinical practice such as comprehensive interdisciplinary dental treatment, introduction of new technology or practical approaches to recognized clinical challenges. They should conform to the highest scientific and clinical practice standards with supporting references where indicated.

Case Reports must represent new or novel approaches to dealing with specific clinical problems. Proper qualifying and/or disclaiming statements should be included if inadequate research is available to validate the techniques being presented. The words "Case Report" should not appear in the title.

Review Articles may be submitted independently or invited by the Editor and include systematic literature reviews of topics related to esthetic and restorative dentistry, as well as more general, comprehensive reviews or updates of a given topic.

Journal of Esthetic and Restorative Dentistry now offers Free Format submission for a simplified and streamlined submission process.

Manuscripts can be uploaded either as a single document (containing the main text, tables and figures), or with figures and tables provided as separate files. Should your manuscript reach revision stage, figures and tables must be provided as separate files. The main manuscript file can be submitted in Microsoft Word (.doc or .docx).

Your main document file should include:

1. A short informative title containing the major key words. The title should not contain abbreviations
2. The full names of the authors with institutional affiliations where the work was conducted, with a footnote for the author's present address if different from where the work was conducted;
3. Acknowledgments;
4. Abstract structured (intro/methods/results/conclusion) or unstructured
5. Up to seven keywords;
6. Main body: formatted as introduction, materials & methods, results, discussion, conclusion
7. References;
8. Tables (each table complete with title and footnotes);
9. Figures (limited to 25): Figure legends must be added beneath each individual image during upload AND as a complete list in the text.

If you are invited to revise your manuscript after peer review, the journal will also request the revised manuscript to be formatted according to journal requirements as described below.

Abstract

A structured abstract of no more than 200 words must be provided for each article. Footnotes, references, and abbreviations are not used in the abstract.

For original research articles, the abstract should include the following headings and sections: (1) Objective. This section includes a statement of the problem and the purpose of the study, (2) Materials and Methods. This section should include materials, methods and statistical analyses employed in the study. (3) Results. (4) Conclusions.

For clinical technique articles and case reports, the abstract should include the following headings and sections: (1) Objective. This section includes a statement of the problem and a general description of the topic or treatment to be addressed. (2) Clinical Considerations. This section should include a brief description of the clinical materials and techniques employed. (3) Conclusions.

For systematic literature review articles, the abstract should include the following headings and sections: (1) Objective. This section should include a statement of the topic to be reviewed and a description of the search strategy of relevant literature (search terms and databases), (2) Materials and Methods. This section should contain inclusion criteria (language, type of studies i.e. randomized controlled trial or other, duration of studies and chosen endpoints). (3) Results. This section should include evaluation of papers and level of evidence. (4) Conclusions.

For general review articles the abstract should include the following headings and sections: (1) Objective. This section should include a statement of the topic to be reviewed. (2) Overview. This section should include a brief summary of the findings of the review. (3) Conclusions.

In addition to Abstracts, all papers should include the following:

Clinical Significance
In a few sentences, please indicate the clinical importance and implications of the research or clinical technique discussed, and if applicable, its relevance to esthetic dentistry.

Keywords
Add at least five keywords that reflect the primary content of the paper.

Title Page
The title page must include all authors' full names, academic degrees, and institutional affiliations and locations. If the manuscript was originally presented as part of a meeting or conference, please include the appropriate name, date, and location. Sources of support in the form of grants, equipment, products, and/or drugs must be disclosed. A corresponding author must be designated and full details of the correspondent's address provided: name, address, telephone and fax numbers, and e-mail address. Unless specified otherwise, the corresponding author's address also will be used for reprint requests.

Disclosure Statement and Acknowledgements (on Title Page)
Please provide any information you wish to include acknowledging contributions from individuals such as for statistical support, lab work, etc. It is imperative that you provide a disclosure statement if you have any financial interest in any of the companies whose products or devices are included in the paper. If no financial interest exists, the following statement must be used: "The authors do not have any financial interest in the companies whose materials are included in this article."

Main Text
Clinical and laboratory/fundamental research papers
Well written and properly structured research hypotheses are the central core of every section of a research manuscript. All research should be hypothesis-driven and clinical and laboratory research manuscripts must state proper research hypotheses, based on the pre-existing knowledge and scientific background supplied in the Introduction. The research hypothesis does not have to be assumed to be correct – it is perfectly acceptable if the research hypotheses are invalidated, as long as the authors provide substantive preliminary rationale for initiating the test, and subsequent information identifying factors that influenced the outcome. The null hypothesis should not be the framework of a paper based on the scientific method. Null hypotheses are applicable only when the collected data are structured for statistical analysis.

Introduction: Provide sufficient background and listing of pre-existing knowledge (references) that support the anticipated outcome of the work. As a general rule, no new references should be introduced past this section. The only exception are references used in supporting Materials and Methods. Do not use author names in the paper: instead of, e.g., Smith at al. reported…, use One study (or similar) reported that ___.34

(where 34 corresponds to the reference by Smith et al.)

State the purpose of your research. This portion should be presented as a paragraph on its own. Within this paragraph, describe the major experimental factors, parameters being measured, and experimental control.
Lastly, clearly state the research hypotheses, labeled as such, and provide a numerical listing of each hypothesis. This listing is key to the paper. The same sequence of hypothesis testing will be used to structure the Materials and Methods, Results, Discussion, and the Conclusions sections.

Materials and Methods: Follow the sequence of the listing of the research hypotheses in describing parameter testing. The detail level in this section should be such that someone experienced in the art and science of those methods could easily reproduce the same experiment in their laboratory.

Describe methods of statistical analysis and provide justification of sample size from pilot testing. The pre-set level of a Type 1 statistical error (the alpha) should be mentioned here as well. Usually, testing is performed at a pre-set alpha of 0.05, meaning that a significant difference exists with 95% confidence.

Note: Do not use Co., Corp. GmbH, Inc., ®, ©, ™, and similar in manuscripts.

Results: Present the results of the findings in the same sequence as the experimental parameters described in the Materials and Methods. If parametric statistical methods were used, provide the initial normality and equivalence of variation results. If those tests are not passed, indicate such and also provide what non-parametric analyses was used instead.

Present the data only once – in either tabular or graphical format. Using either method, provide an embedded coding system to identify groups that were identified as statistically not different if appropriate. Indicate the significance level of each major experimental factor, as well as any interaction terms (p-values).

Discussion: Without repeating the purpose of the research, start this section with addressing individual research hypotheses, ideally in separate, sequential paragraphs. Start with a sentence indicating if the experimental data upheld or invalidated the corresponding research hypothesis. After that, compare and contrast the current findings related to this hypothesis with work performed by others in the field (references from the Introduction). Provide insights as to why or why not similar information was found.

After addressing individual research hypotheses, put together the knowledge gained from these findings into one coherent theme. Discuss the clinical/research significance of the findings or the significance of this new knowledge over that in the existing literature. This is where the author is allowed to speculate for the first and only time.

Provide a paragraph on the study limitations. Applying the research findings outside of the experimental design needs to be taken with caution. Lastly, provide insight as to what types of research need to be done as a consequence of the new knowledge found in the current project.

Conclusions should contain no speculative statements – only the facts as they are limited to what the data reveal about the tested research hypotheses, following their order. It is good to preclude the listing of conclusions with "Within the limitations of this current study, it was concluded that:"

1. Address Research Hypothesis #1
2. Address Research Hypothesis #2
3. and so on.

Do not use conditional/modal auxiliary verbs such as can, could, may, might, must, shall, should, will, would (It was concluded, not It can be concluded). Avoid interpretation and/or comparison of study results with literature findings and do not use abbreviations and acronyms in the conclusion section.

References

References should be numbered consecutively in the order in which they are first mentioned in the text, and listed at the end of the text in numeric, not alphabetic, order. Identify references in text, tables, and legends by Arabic numerals in superscript. References cited only in tables or figure legends should be numbered subsequent to the numbering of references cited in the text. Unpublished sources, such as manuscripts in preparation and personal communications, are not acceptable as references. Only sources cited in the text should appear in the reference list. List all authors when four or fewer; when more than four, list the first three and add "et al."

How to Format Citations

Journal Articles:
Donnelly PV, Miller C, Ciardullo T, et al. Occlusion and its role in esthetics. J Esthet Restor Dent., 1996; 8(2):111-118

Books:
Hickey JC, Zarb GA. Boucher's prosthodontic treatment for edentulous patients. 9th ed. St. Louis (MO): CV Mosby; 1985.

Tables
Type or print out each table with double spacing on a separate page. Ensure that each table is cited in the text, number tables consecutively in the order of their first citation in the text, and provide a brief title for each. Give each column a brief, descriptive heading. No table should contain data that could be included in the text in several sentences.

Figure Legends
Please include on a separate page all figure and/or illustration legends. This page should be clearly marked. Figure legends must be numbered to correspond with the figures and typed or printed on a separate page. Symbols, arrows, or letters used to identify parts of the illustration must be explained clearly in the legend. If a figure has been previously published, the legend must acknowledge the original source.

Figures and Illustrations

Images must be submitted as individual files, in either TIF or EPS format, as indicated below.

COLOR photographs should be saved as TIF files in CMYK at a minimum of 12.5 cm (5 in.) in width at 300 dpi.

BLACK AND WHITE photographs should be saved as TIF files in grayscale at a minimum of 12.5 cm (5 in.) in width at 300 dpi.

Line drawings should be prepared in Microsoft Word or PowerPoint, or in Adobe Illustrator without embedded images from other sources. Existing line drawings should be scanned at 1,200 dpi at a minimum of 12.5 cm (5 in.) in width and saved as EPS files.

All images must be labeled clearly in consecutive order with the figure number and part. Photomicrographs must feature internal scale markers. Symbols, arrows, or letters used in these should contrast with the background. Original magnification must be provided.

We strongly recommend you stick to a **25-figure limit**, please contact us if you believe your article is an exception. Figure reproduction cannot improve on the quality of the originals. It does not correct the exposure, sharpen the focus, or improve the contrast of the original print. Any special instructions about sizing, placement, or color should be clearly noted. Electronic submissions are not returned to the authors.

Guidelines for Cover Submissions
If you would like artwork related to your manuscript to be considered to appear on the cover of the journal, you will be able to indicate which image files should be considered in the system at the time of submission.

Miscellaneous Formatting Guidelines

Product trade names cited in the text must be accompanied by a generic term, and followed by the manufacturer, city, and state/country in parentheses.

References in the text and figure legends to teeth illustrated in a figure should be identified by name (eg, upper right central incisor), not by number.

The manuscripts submitted to the journal must be written in appropriate English. It is the author's responsibility to ensure this by either having sufficient English language skills or by obtaining the services of an English-as-second-language expert.

Please note that the term "esthetic" should be used in manuscripts as opposed to the alternative spelling "aesthetic."

The same general headings and sections should be used in the articles as used in the abstract.

PERMISSIONS

Written permission must be obtained for material that has been published in copyrighted material; this includes tables, figures, and quoted text that exceeds 150 words.

Photographs of People
The Journal of Esthetic and Restorative Dentistry follows current HIPAA guidelines for the protection of patient/subject privacy. If an individual pictured in a digital image or photograph can be identified, his or her permission is required to publish the image. The journal may not collect consent forms under HIPPA guidelines, however authors are expected to be able to present a signed consent form if asked. Authors must have patient authorization for images, or else the image/photo must be altered such that the individual cannot be identified (black bars over eyes, etc).

Manipulation of Digital Photos
Authors should be aware that the Journal considers digital images to be data. Hence, digital images submitted should contain the same data as the original image captured. Any manipulation using graphical software should be identified in either the Disclosure and Acknowledgements section or the caption of the photo itself. Identification of manipulation should include both the name of the software and the techniques used to enhance or change the graphic in any way. Such a disclaimer ensures that the methods are repeatable and ensures the scientific integrity of the work.

No specific feature within an image may be enhanced, obscured, moved, removed, or introduced. The grouping of images from different SEMS, different teeth, or the mouths of different patients must be made explicit by the arrangement of the figure (i.e., by using dividing lines) and in the text of the figure legend. Adjustments of brightness, contrast, or color balance are acceptable if they are applied to the whole image and as long as they do not obscure, eliminate, or misrepresent any information present in the original, including backgrounds.

The removal of artifacts or any non-integral data held in the image is not allowed. For instance, removal of papillae or "cleaning up" of saliva bubbles is not allowed.

Cases of deliberate misrepresentation of data will result in rejection of a manuscript, or if the misrepresentation is discovered after a manuscript's acceptance, revocation of acceptance, and the incident will be reported to the corresponding author's home institution or funding agency.

PLAGIARISM PREVENTION

All papers will be subject to examination with the iThenticate Professional Plagiarism Prevention program (www.ithenticate.com) prior to publication to look for plagiarism and unintentional duplication of wording from other sources. It is important to ensure that the papers are fully original in content to protect both the author and the journal. If the paper is found to include block segments of words or sentences that clearly come from another source or sources, the author will be asked to re-write the section and/or reference the material appropriately. If excessively large portions are found to have been copied verbatim, the paper may be subject to rejection.

Article Preparation Support

Wiley Editing Services offers expert help with English Language Editing, as well as translation, manuscript formatting, figure illustration, figure formatting, and graphical abstract design – so you can submit your manuscript with confidence.

Also, check out our resources for Preparing Your Article for general guidance about writing and preparing your manuscript.

Further Information for Authors of Accepted Papers

Funder arrangements

Certain funders, including the NIH, members of the Research Councils UK (RCUK) and Wellcome Trust require deposit of the Accepted Version in a repository after an embargo period. Details of funding arrangements are set out at the following website: http://www.wiley.com/go/funderstatement. Please contact the Journal production editor if you have additional funding requirements[SP1] .

Institutions

Wiley has arrangements with certain academic institutions to permit the deposit of the Accepted Version in the institutional repository after an embargo period. Details of such arrangements are set out at the following website: http://www.wiley.com/go/funderstatement.

If you do not select the Open Access option you will follow the current licensing signing process as described above.

For authors choosing Open Access:

If you decide to select the Open Access option, please use the links below to obtain an open access agreement to sign [this will supersede the journal's usual license agreement]. By selecting the Open Access option you have the choice of the following Creative Commons License open access agreements:

Creative Commons Attribution License OAA

Creative Commons Attribution Non-Commercial License OAA

Creative Commons Attribution Non-Commercial -NoDerivs License OAA

To preview the terms and conditions of these open access agreements please click the license types above and visit http://www.wileyopenaccess.com/details/content/12f25db4c87/Copyright--License.html.

Online production tracking is now available for your article through Wiley Author Services.

Author Services enables authors to track their accepted articles through the production process to publication online and in print. Authors can check the status of their articles online and choose to receive automated e-mails at key stages of production. The author will receive an e-mail with a unique link that enables them to register and have their article automatically added to the system. Please ensure that a complete e-mail address is provided when submitting the manuscript.

Visit http://authorservices.wiley.com/bauthor/ for more details on online production tracking and for a wealth of resources including FAQs and tips on article preparation, submission and more.

Article Promotion Support

Wiley Editing Services offers professional video, design, and writing services to create shareable video abstracts, infographics, conference posters, lay summaries, and research news stories for your research – so you can help your research get the attention it deserves.

Wiley's Author Name Change Policy

In cases where authors wish to change their name following publication, Wiley will update and republish the paper and redeliver the updated metadata to indexing services. Our editorial and production teams will use discretion in recognizing that name changes may be of a sensitive and private nature for various reasons including (but not limited to) alignment with gender identity, or as a result of marriage, divorce, or religious conversion. Accordingly, to protect the author's privacy, we will not publish a correction notice to the paper, and we will not notify co-authors of the change. Authors should contact the journal's Editorial Office with their name change request.