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ESTHETIC REHABILITATION WITH INDIRECT RESIN ON ANTERIOR TEETH: A CLINICAL REPORT

Reabilitação estética com resina indireta em dentes anteriores: um relato clínico

Rehabilitación estética con resina indirecta en dientes anteriores: reporte clínico

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ABSTRACT

Introduction: The aesthetic rehabilitation of endodontically treated teeth depends on the destruction degree of the crown, the bone support, type of prosthesis, and chewing forces. In these cases, indirect restorations with composite resins are an excellent alternative. The indirect composite resins have improved physical and mechanical properties due to incorporating of inorganic fillers and multifunctional monomers. These components offer a greater bonding strength to the indirect restorations, which is advantageous for further rehabilitations with ceramic crowns. **Objective**: To present an aesthetic rehabilitation of anterior teeth with indirect composite resin as a feasible and less expensive treatment alternative. **Case Report:** Upon clinical examination, extensive and deficient restorations were observed in the upper anterior teeth. The proposed treatment plan was the aesthetic rehabilitation of endodontically treated teeth with indirect restorations using ceromer. **Conclusions:** This treatment represented an excellent alternative for aesthetic rehabilitation of endodontically treated teeth in cases of great dental crown destruction or small dental absences.

Keywords: Ceromer. Crowns. Fiberglass. Adhesiveness.

RESUMO

Introdução: A reabilitação estética de dentes tratados endodonticamente depende do grau de destruição da coroa, do dente em questão, do suporte ósseo, do tipo de prótese e dos tipos de forças a que esses dentes serão submetidos. As resinas compostas indiretas apresentam propriedades físicas e mecânicas aprimoradas graças à incorporação de componentes inorgânicos e monômeros multifuncionais com maior número de pontos de união, tornando-os capazes de solucionar os problemas em que seriam indicadas restaurações cerâmicas. **Objetivo**: Apresentar um relato de caso clínico de uma reabilitação estética de dentes anteriores com resina composta indireta como alternativa de tratamento viável e de menor custo. **Relato de Caso:** Ao exame clínico foram observadas restaurações amplas e deficientes nos dentes anteriores superiores. O plano de tratamento proposto reabilitação estética dos elementos dentários com cerômeros. **Conclusões:** Este tratamento representou uma opção viável e de menor custo que pode ser utilizado tanto em situações de grande destruição dentária como em pequenas ausências dentárias, em substituição às restaurações de cerâmica.

Palavras-Chave: Cerômero. Coroas. Fibra de vidro. Adesividade.

RESUMEN

Introducción: La rehabilitación estética de los dientes tratados endodónticamente depende del grado de destrucción de la corona, el diente en cuestión, el soporte óseo, el tipo de prótesis y los tipos de fuerzas a las que estos dientes serán sometidos. Las resinas compuestas indirectas tienen propiedades físicas y mecánicas mejoradas gracias a la incorporación de componentes inorgánicos y monómeros multifuncionales con mayor número de puntos de unión, lo que las hace capaces de resolver los problemas en los que estarían indicadas las restauraciones cerámicas. **Objetivo:**

Presentar un caso clínico de rehabilitación estética de dientes anteriores con resina compuesta indirecta como alternativa de tratamiento viable y menos costosa. **Reporte de Caso:** En el examen clínico, se observaron restauraciones extensas y deficientes en los dientes anteriores superiores. El plan de tratamiento propuesto para la rehabilitación estética de elementos dentales con cerómeros. **Conclusiones:** Este tratamiento representó una opción viable y menos costosa que se puede utilizar tanto en situaciones de gran destrucción dentaria como en pequeñas ausencias dentales, en sustitución de las restauraciones cerámicas.

Palabras clave: Ceromer. Coronas. Fibra de vidrio. Adhesividad.

Introdution

Endodontically treated teeth show great loss of coronal structure due to endodontic access, extensive caries, anterior restorations and trauma. Thus, restoring these teeth represents a major challenge in clinical practice and often requires the use of intra root posts, which further weakens the dental structure[1,2].

Advances in the materials used in dentistry, especially adhesive systems and restorative materials, have enabled the development of more conservative techniques with excellent esthetics and better mechanical properties, capable of restoring function, shape, contour, and color, in addition to resistance. However, the main disadvantage of direct composite resin rehabilitation is the high polymerization shrinkage, which can lead to marginal leakage at the tooth-restoration interface, exceeding the bond strength[3].

Thereby, indirect materials started to be more and more indicated in several situations for presenting improved esthetics and greater resistance to fracture[4]. Although ceramic restorations have many advantages over resin restorations, including better fracture toughness, color stability, surface smoothness, and wear resistance, resin restorations may be preferred due to their low modulus of elasticity[5,6]. In addition, indirect resin restorations are a lower cost and shorter working time alternative[7].

As a viable alternative between resins and ceramics for large structural losses resinous materials with ceramic components, known as ceromers, emerged[3]. These materials contain microhybrid inorganic particles, surrounded by a photoactive organic matrix[8]. Ceromers have a high monomer conversion rate, which helps to improve their mechanical properties, promoting better marginal integrity and color stability of the tooth restoration interface[3].

Thus, the present clinical report presents an esthetic rehabilitation of anterior teeth using indirect restorations in ceromer as an alternative of conservative treatment at a lower cost to the patient.

Case Report

Patient L.R.S, woman, 33 years old, attended the Dental Specialization Course Clinic of the Federal University of Rio Grande do Norte complaining of the disharmony of her smile due to the presence of deficient restorations in the maxillary anterior region (Fig. 1). In the first session, a diagnostic cast was obtained for planning and preparing the treatment. The proposed treatment was the realization of ceramic crowns for maxillary incisors teeth, but the patient could not afford the treatment, so the option was the use of indirect composite resins to make the total crowns. In the second session, after choosing the treatment, a radiographic examination was performed to evaluate the endodontic treatment. As this was satisfactory, the operative clinical procedures were initiated.

Figure 1. Initial aspect of the anterior teeth. Natal-RN, 2021.

Thus, the teeth were prepared with diamond tips (KG Sorensen, Cotia, SP, Brazil) (Fig. 2) and provisional crowns were made of self-curing acrylic resin. The third session consisted of testing and cementing the fiberglass post with self-adhesive resin cement RelyX U200 (3M ESPE, Saint Paul, MN, USA). The cement was then dispensed on the glass plate using the clicker package proportion and manipulated after the instructions of manufacturer and then inserted into the interior of the root canal along with the post. After the posts were cemented, the provisional crowns were made with self-curing acrylic resin.

Figure 2. Preparation for full crown on anterior teeth. Natal-RN, 2021.

In the fourth session, the provisional crowns were removed and the gingival retraction was performed with 0 and 00 retractor cord Ultrapak (Ultradent Products, South Jourdan, UT, USA) for better reproduction of the finish line during the molding double impression, which was performed with the combination of light body and heavy body addition silicone Express XT (3M ESPE, Saint Paul, MN, USA). The working cast was obtained to be sent to the laboratory to get the crowns. The fifth session consisted in the installation of the prostheses, and thus 35% Ultra-Etch (Ultradent Products, South Jourdan, UT, USA) phosphoric acid was used in each piece for 1 minute (Fig. 3).

Figure 3. Acid conditioning of the inner surface of the crown. Natal-RN, 2021.

Soon after, the crowns were washed and dried to apply the universal adhesive Scotchbond universal (3M ESPE, Saint Paul, MN, USA). The conventional RelyX

Ultimate (3M ESPE, Saint Paul, MN, USA) dual resin cement, dispensed through the clicker package was used for the cementation, manipulated according to the instructions of manufacturer and applied inside the crowns and in the dental preparations. With the modified absolute isolation already in place, the crowns were accommodated in the preparation and the excesses were removed with flexible rod for the definitive photoactivation (Fig. 4).

Figure 4. Application of universal adhesive on the inner surface and cementation of the crowns. Natal-RN, 2021.

After cementation, finishing, and polishing was performed with steel blade number 12 (Feather Safety, Osaka, Japan), abrasive tips and felt discs (American Burrs, Palhoça, SC, Brazil) (Fig. 5).

Figure 5. Final aspect of the anterior teeth. Natal-RN, 2021.

Discussion

Esthetic rehabilitation is a treatment often performed in patients who seek to improve the appearance of their smile, and ceramic treatment is very suitable for these situations, as it has some advantages, such as translucency similar to enamel, allowing greater mimicry of natural teeth, but with a disadvantage its high cost[9].

Ceromers are indirect composites that seek to minimize the effects of polymerization shrinkage common to composite resins and allow for better resistance, in addition to simplicity in manufacturing and lower cost compared to ceramics[10].

Therefore, rehabilitation with ceromer can be indicated for cases that involve esthetic compromise, as well as for the reestablishment of the maxillomandibular relationship that was compromised by tooth wear, through onlays in the posterior teeth[11].

The use of ceromers by the indirect technique, through full crowns, presents the advantages of lower polymerization stress, better surface smoothness, marginal integrity, sculpture and adaptation when compared to the direct technique using composite resin, while compared to the indirect technique with ceramic systems , ceromers have inferior mechanical properties, in addition to lower biocompatibility and color stability, however, they are less friable, produce less wear to the antagonist, in addition to lower cost[12].

However, the bonding of the cementing agent to the dentin substrates is a determining factor for the clinical success of restorative treatment, which depends on a reliable interaction at the substrate/cementing agent and cementing agent/dentin interfaces, as adhesion to dentin remains a major challenge for restorative dentistry and represents one of the points for the clinical success of cemented restorations[13,14].

One of these cementation techniques refers to the use of universal adhesives as an internal surface treatment for restorations, promoting a more satisfactory adhesion due to the presence of some chemical components such as 10-Methacryloyloxydecyl dihydrogen phosphate (MDP)[15], besides dimethacrylates, and other additives that

improve the mechanical properties of the polymer and give it a certain hydrophobicity, consequently improving the bonding properties, especially in the long term[16].

Conclusion

Despite its limitations, the indirect composite resin technique is financially viable and guarantees short to medium term longevity for esthetic restorations as long as the treatment is well planned, the appropriate materials and instruments are used and the patient is aware of his/her care and habits.

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