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RESTORATIONS WITH CERAMIC LAMINATES AND THE INDICATIONS AND CONTRAINDICATIONS OF THIS TREATMENT: INTEGRATIVE REVIEW

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ABSTRACT

The search for restorations with ceramic laminates has been one of the main topics in dentistry today, since these restorations can reestablish aesthetics while having an extensive longevity. Therefore, ceramic laminates can positively influence the self-esteem of patients, promoting satisfaction in relation to their smile. The aim of this study was to review the literature, showing the indications and contraindications of restorations with ceramic laminates and the reasons that induce success or failure in this type of treatment, as well as its limitations. In view of the above, it is important to know the parameters to be evaluated before planning a treatment with ceramic laminates, in order to achieve clinical success.

Keywords: Dental laminates, Ceramics, Dental Aesthetics.

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INTRODUCTION

The constant search for the improvement of aesthetics in Dentistry is one of the factors that most contributes to the elaboration and improvement of materials and techniques. Among the materials, ceramics are an excellent option in the search for naturalness, due to their ability to imitate dental tissues (AZER et al., 2011; LEE; CHOI, 2018; MORIMOTO et al., 2016).

As a result of this reality, among ceramic materials, laminates stand out for their aesthetics, color stability, and biocompatibility with periodontium. Therefore, they end up being the choice of many professionals and patients (MARCHIONATTI et al., 2017).

The growing relevance of personal image in modern society makes the demand for this type of treatment increasingly common, since the smile is one of the first characteristics observed in interpersonal contact. In this way, the lack of harmony in the smile can directly affect people's self-esteem, causing aesthetic and, consequently, emotional problems. In this scenario, restorative treatment with ceramic laminates can directly interfere with patients' quality of life (MARTIN; CONCEIÇÃO et al., 2007).

According to Hilgert (2009), when there is a need to change the color or shape of the buccal and incisal surfaces of anterior teeth and premolars, the use of ceramic laminates can provide the desired result, especially on darkened substrates; In this way, a balance can be achieved between the ability to mask the substrate and the final aesthetic result, increasing the thickness of the restoration, or using ceramics with greater opacity.

In this context, the objective of this integrative review is to highlight important aspects to be considered prior to the planning of treatment with ceramic laminates, emphasizing the indications and contraindications.

METHODOLOGY

This is an integrative review (WHITTEMORE; KNAFL, 2005), which from the study of the literature aims to bring to light a particular subject (BROOME, 2000).

The data collection of this work was carried out from a selection of national and international articles. The search was carried out using the PubMed and Google Scholar platforms. In Portuguese and English, the descriptors used for the research were: dental laminates; Ceramic; dental aesthetics; dental veneers; ceramics; esthetics, dental. The inclusion criteria established were: literature reviews, doctoral theses, and laboratory and clinical trial articles published between 2000 and 2022, with emphasis on works published

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between 2010 and 2022. The exclusion criteria were: articles prior to 2000 and course completion papers.

RESULTS

The development of materials that seek to preserve as much healthy dental tissue as possible and enlighten patients about the advantages of this preservation, has made ceramic laminates obtain great relevance in Dentistry. This is due to the possibility of performing esthetic restorations with less wear compared to total crowns (HILGERT, 2009).

In this way, the preparations are less invasive, aiming at the maintenance of the tooth structure, especially the enamel, since when adhesion is performed on this substrate, a more effective and long-lasting microretention is obtained. Therefore, it has been observed that enamel preservation significantly reduces the failure rate (BLUNCK et al., 2020, GRESNIGT; ÖZCAN; KALK, 2011). Dentin exposure should be avoided, since the modulus of elasticity of this substrate is lower compared to that of porcelain, resulting in greater chances of fracture (CALAMIA; CALAMIA, 2007).

On the other hand, it is worth mentioning that the thickness of ceramic laminates is directly related to the ability to mask the substrate, that is, the greater the thickness, the greater the masking capacity. On the other hand, the thicker the material, the more invasive the preparation (ȘOIM et al., 2018). It is also necessary to consider that the greater the thickness of the ceramic, the less color change caused by the resin cement (TURGUT; BAGIS, 2013).

Still with regard to this context, it is important to emphasize that, although ceramic laminates can be cemented in regions with the presence of aged resin, the degradation of polymers can impair the adhesion of resin cements on these surfaces. However, with the evolution of surface conditioning methods and bonding agents, it is possible to mitigate this factor (GRESNIGT; KALK; ÖZCAN, 2013, p. 824).

When considering these aspects, it is necessary to consider that the improvement of ceramic materials has made it possible to carry out increasingly satisfactory restorations. Understanding the particularities of each system enables the best option according to the clinical situation (TURGUT; BAGIS, 2013). Factors such as translucency, substrate color and the forces applied in the restoration region should be considered when choosing the system (LIM; YU; LEE, 2010). Among the systems commonly used for the manufacture of

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ceramic laminates, we have conventional feldspar ceramics and reinforced vitreous ceramics (MORIMOTO et al., 2016).

Conventional feldspar ceramic has excellent translucency, that is, it is ideal for cases where high characterization is required. However, the mechanical resistance of this system is low. Thus, conventional feldspar ceramic laminates are indicated in cases of less invasive preparations, with great aesthetic demand and where there is no need for flexural strength (PINI et al., 2012).

On the other hand, reinforced vitreous ceramics have better mechanical properties compared to conventional feldspar ceramics. This is due to the increase in load particles that provide better resistance to fracture, bending and erosion. Charge particles also promote optical effects such as opacity and opalescence, however, these systems can be translucent, and the chemical composition and percentage of crystals will dictate the degree of opacity of the material. Therefore, reinforced vitreous ceramic laminates are indicated in cases where there is a greater need for masking and risk of bending (PINI et al., 2012).

The interaction between the dental substrate, the ceramic and the cement will dictate the aesthetics of the treatment, that is, by modifying only one of these factors, the final result can be significantly altered (PORDEUS; BATISTA et al., 2022) in addition, it is necessary to evaluate the patient's occlusal relations before treatment with ceramic laminates, both dynamic and static occlusion. If it is observed that the occlusion is not adequate, the malocclusion should be treated. It is also added that the treatment with ceramic laminates must include an anterior and lateral guide. (DA CUNHA et al., 2014).

Furthermore, the condition of the periodontium should be investigated, as treatments with ceramic laminates should be performed in cases where periodontal health is present. It should be noted that if the patient has gingival health prior to treatment and the margins of the restorations have an adequate finish, ceramic laminates will cause minimal responses and in some cases, no response at all. If the interface between the cement and the filling is not adequate, periodontal tissues can be impaired. It is necessary to consider that the patient's oral hygiene after treatment also plays a fundamental role in the health of the periodontium (PEUMANS et al., 2000; STRAZZI-SAHYON et al., 2020).

Such considerations indicate that, in order to achieve success in the treatment, one must have knowledge about the factors that influence the result of restorations with ceramic laminates, as well as the indications and limitations of this type of procedure.

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INDICATIONS

Staining and Darkening Teeth

The use of ceramic laminates as a treatment for teeth with aesthetically unsatisfactory colors has been shown to be effective, however, it should be noted that ceramic laminates should be used in cases where in-office and home whitening do not present satisfactory performance (CHRISTENSEN, 2006). Severe darkening due to the use of tetracycline, for example, is a condition that illustrates these circumstances well and is commonly treated with ceramic laminates (FAUS-MATOSES et al., 2017).

Diastema

Diastema is a spacing between the teeth, with no point of contact between them. Diastemas can compromise the aesthetics of the smile, especially in the upper teeth (LEVY-BERCOWSKI; ABREU, 2019). Ceramic laminates are among the possibilities for the treatment of diastemas (DA CUNHA et al., 2014).

Dental Anatomy

Treatment with ceramic laminates can be performed in order to change the shape, contour, volume and size of the teeth (PINI et al., 2012). It is important to emphasize that the aesthetic impairment in some patients is due to too much gingival exposure and, therefore, gingival plastic surgery should be considered as a possibility of treatment (CHRISTENSEN, 2006).

CONTRAINDICATIONS

Great Coronary Destruction

A large coronary destruction prevents the treatment with ceramic laminates from being carried out properly, because in addition to needing a large surface due to the reduced thickness, the ceramic laminates must be cemented, ideally, to the enamel. Therefore, when this substrate is insufficient, the success rate decreases significantly (BLUNCK et al., 2020; GRESNIGT; KALK; ÖZCAN, 2013; PINI et al., 2012).

Extensive Restorations

The importance of having a considerable amount of enamel as a substrate for treatment with ceramic laminates makes extensive restorations unsuitable for this type of

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restoration. Thus, in these cases, treatment with total crowns should be considered (BLUNCK et al., 2020; CHRISTENSEN, 2006).

Malocclusion

Occlusal problems are among the factors that most increase the chances of treatment failure with ceramic laminates. Therefore, the patient must have an ideal occlusion (DA CUNHA et al., 2014; LI et al., 2014). It is worth mentioning that, in some cases, orthodontic treatment can establish satisfactory aesthetics, and treatment with ceramic laminates is not necessary (CHRISTENSEN, 2006).

Periodontal Disease

Periodontal condition is a determining factor in the long-term success of treatment with ceramic laminates. Before any restorative procedure, it is essential to have periodontal health (DA CUNHA et al., 2014).

Bruxism

The probability of fracture and detachment of ceramic laminates in patients with bruxism is significantly higher compared to patients who do not have this parafunctional habit. However, it was found that the use of myorelaxant plaques can reduce the failure rate of this treatment. That said, when bruxism is suspected, the patient should be advised to use this device (GRANELL-RUÍZ et al., 2014).

DISCUSSION

Restorations with ceramic laminates, as they denote minimally invasive preparations, are a very conservative treatment possibility, restoring aesthetics and function, thus it is a treatment option considered successful (DA CUNHA et al., 2014).

Beier et al. (2010) observed 152 restorations with ceramic laminates for 10 years and reported that the survival rate was 93.5%. The main reason for treatment failures was ceramic fractures, which corresponded to 44% of failures. Another relevant data observed was that bruxism increased the risk of failure by 7 times. It is also noteworthy that marginal discolorations were frequently more observed in smoking patients, in addition, the restorations were performed by experienced professionals, who respected the ideal occlusal parameters, and the patients were in periodontal health. (BEIER et al., 2010).

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Another study, which followed 323 restorations with ceramic laminates over a period of 3 to 11 years, found fracture in only 4% of cases and a subtle marginal pigmentation in 39.3% of cases. It is interesting to note that 97.1% of the patients considered the result satisfactory and 98% of the cases had marginal integrity (GRANELL-RUIZ et al., 2010).

It is then observed that among the factors that gave so much prominence to the treatment with ceramic laminates, longevity is one of the most relevant, however, in order to be successful in the long term, a plan must be prepared, respecting the indications (PINI et al., 2012; SHONO; NAHEDH, 2012).

Still, even with the remarkable longevity achieved in the treatment with ceramic laminates, the oral cavity is a hostile environment, that is, dental materials will suffer effects such as fatigue and degradation. These harms will inevitably cause the aging of materials (GRESNIGT; KALK; OZCAN, 2013).

Restorations with ceramic laminates should be performed with common sense, observing the contraindications of the treatment. The professional must follow the research to be aware of the innovations in the techniques and materials used, always aiming at the improvement of treatments and the well-being of patients.

CONCLUSION

Ceramic laminates provide excellent results, as they represent a predictable, conservative and long-lasting treatment. Their ability to restore the aesthetics and function of the teeth makes these restorations often the option chosen as a therapeutic option. However, it is crucial that the professional has knowledge about the indications, limitations and factors that influence the outcome of the treatment.

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