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Adhesive and Conventional Cementation in Ceramic and Metal-Ceramic Fixed Prostheses Supported by Teeth: A Literature Review

Adhesive and Conventional Cementation in Fixed Ceramic and Metalloceramic Prostheses Supported by Teeth: Literature Review

Adhesive and conventional cementation in fixed ceramic and metal-ceramic prostheses supported by teeth: Bibliographic review

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1 INTRODUCTION

Cementation is an essential step for the longevity and clinical success of prostheses. Fixed restorations directly influence retention, marginal adaptation, and biomechanical behavior (DE LA MACORRA; PRADÍES, 2002; HILL, 2007).

With the advancement of ceramic and metal-ceramic restorative materials, the appropriate selection of cement is crucial. It has become a determining factor in the clinical and aesthetic performance of treatments. rehabilitators (PEUMANS et al., 2019; FRANKENBERGER et al., 2020).

Conventional cements, such as zinc phosphate, polycarboxylate, and zinc ionomers... Glass restorations have come to dominate dental practice due to their predictability, ease of use, and low cost. (DE LA MACORRA; PRADÍES, 2002; HILL, 2007). However, the introduction of cements Resin adhesives have brought new possibilities for micromechanical and chemical bonding. providing greater resistance to fractures and better marginal sealing, crucial aspects for Metal-free ceramic restorations. (HILL; LOTT, 2011; RANKENBERGER et al., 2020).

Currently, the choice between adhesive and conventional cementation should be based on specific criteria. clinical and scientific factors, considering factors such as the type of dental substrate, the material restorative, insulation conditions and humidity control (DE LA MACORRA; PRADÍES, 2002; HILL, 2007).

This work aims to review the existing literature, comparing cementation methods. Adhesive and conventional techniques in ceramic and metal-ceramic fixed prostheses supported by teeth. in order to offer evidence-based clinical practice (PEUMANS et al., 2019; FRANKENBERGER et al., 2020).

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2 OBJECTIVES

2.1 General objective

To conduct a literature review on the use of adhesive cementation and...
conventional in fixed ceramic and metal-ceramic prostheses supported by teeth.

• Systematize the main findings from the literature on adhesive and conventional cementation.

• To highlight the differences in clinical performance between ceramics and metal-ceramics in
It depends on the type of cement used.

• To provide theoretical support for clinical practice and future research in the field.

2.2 Specific objective

• Compare the main indications for each cementation technique.

• To evaluate the clinical advantages and limitations of adhesive and conventional cementation.

• Identify the factors that influence the longevity and clinical success of fixed prostheses.

• Analyze scientific evidence to guide the most appropriate clinical choice.

3. Justifications

The choice of cementation method directly influences retention and adaptation.
marginal and longevity of fixed prostheses (SILVA, 2021; BLATZ, 2017). The development
The use of resin-based adhesive cements has broadened the field of application for restorations.
ceramics, offering better aesthetics and mechanical resistance (GHODSI et al., 2023;
(KURARAY NORITAKE, 2021). However, conventional cementation still presents
advantages in certain clinical situations, such as in metal-ceramic prostheses and in
preparations with greater mechanical retention (BRONDANI et al., 2017).

Given the diversity of materials and protocols available, it becomes necessary
to critically understand the properties, indications, and limitations of each system of
Cementation (PEUMANS et al., 2019; FRANKENBERGER et al., 2020). Thus, this review
The critique aims to offer a solid scientific basis for the dentist to select the method.
most appropriate for each clinical case (HILL; LOTT, 2011).

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4 METHODOLOGY

This is a literature review, descriptive and comparative in nature, based on Scientific articles published between 2002 and 2025 were used as the main sources. articles by Hill (2007), Hill and Lott (2011) and De La Macorra and Pradíes (2002), supplemented based on recent publications available on PubMed (PEUMANS et al., 2019; FRANKENBERGER et al., 2020).

The inclusion criteria involved studies that addressed clinical efficacy, physicochemical properties and biomechanical behavior of conventional and non-conventional cements stickers applied in supported prostheses (DE LA MACORRA; PRADÍES, fixed put teeth 2002; HILL, 2007). Studies focusing on were excluded. implants or in temporary cementations. The critical analysis considered the evidence comparative studies between the systems, seeking to identify trends and practical recommendations. (HILL; LOTT, 2011; PEUMANS et al., 2019).

5 LITERATURE REVIEW

5.1 Conventional Cementation

Conventional cements – such as zinc phosphate, polycarboxylate and ionomer cements Glass – remain widely used in metal-ceramic prostheses due to their clinical reliability and ease of handling (DE LA MACORRA; PRADÍES, 2002; HILL, 2007). According to De La Macorra and Pradíes (2002), these materials meet the requirements of They meet satisfactory biological and mechanical requirements and exhibit good resistance.

Zinc phosphate is the most traditional cement, with high rigidity and a long history of use. clinical success. However, its lack of chemical adhesion to the dental substrate and initial acidic pH. They can cause postoperative sensitivity (HILL, 2007). Polycarboxylate cement, on the other hand, It showed limited adhesion to dentin, while glass ionomers stand out for... Fluoride release and biological compatibility (FRANKENBERGER et al., 2020).

These systems essentially depend on the mechanical retention of the preparation, being Suitable for full or partial crowns with good axial wall height. For cementation. For conventional preparation to be adequate, it is recommended that the preparation have a thickness between 4 and 6 mm. ensuring sufficient retention and stability. Its main limitation lies in the low solubility in moist environments and the inability to reinforce fragile substrates, such as

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pure ceramics (SHILLINGBURG et al., 2012).

5.2 Adhesive Cementation

Adhesive cementation revolutionized restorative dentistry by enabling a bond.
micromechanical and chemical interactions between the cement, the tooth, and the restorative material (HILL, 2007;
(HILL; LOTT, 2011). These cements exhibit high tensile and shear strength,
Low solubility and excellent color stability make them indispensable for
Metal-free ceramic restorations.

These systems allow for greater preservation of tooth structure and better distribution.
They are stress-resistant, making them ideal for veneers, inlays, onlays, and lithium disilicate or zirconia crowns.
conditioned (FRANKENBERGER et al., 2020). However, its success depends on the correct
Acid conditioning, silane application, and absolute humidity control – factors that
They make the procedure sensitive to technique.

Comparatively, adhesive cements offer superior retention performance.
and marginal sealing, but they require more clinical time and higher costs. The choice should
Consider the type of substrate and the operator's experience (PEUMANS et al., 2019).

5.2.1 Critical Comparison Between Techniques

Studies indicate that there is no "ideal cement," but rather a need for adjustments to clinical conditions
(DE LA MACORRA; PRADÍES, 2002). The physical properties
Improved use of the latest materials doesn't always translate into better performance.
clinical.

Conventional cementation proves to be more predictable in prostheses with retention.
proper mechanics, that is, when the preparation has parallel axial walls or
slightly convergent, minimum height of 4 to 6 mm and well-defined cervical termination, which
It guarantees stability and resistance to disinsertion (SHILLINGBURG et al., 2012). Furthermore, it is...
indicated in cases of subgingival margins. Adhesive cementation is preferable in
pure ceramic restorations and in situations where isolation is possible and preparation is easier.
conservative. Hill and Lott (2011) emphasize that adhesive cementation increases resistance to
fracture of ceramics, while conventional methods can limit the aesthetic performance of materials.
translucent. Therefore, the clinical decision must balance technical, economic and...
aesthetic, aiming at the longevity and predictability of the treatment (PEUMANS et al., 2019).

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5.3 Factors for Clinical Success and Longevity of Fixed Prostheses

The longevity of fixed prostheses depends on multiple factors, including the type of...
The cement used, the quality of the preparation, moisture control, and the type of restorative material (DE LA MACORRA; PRADÍES, 2002; HILL, 2007) all contribute to the restoration process. Research indicates that Defects, microleaks, and marginal misfits are the main causes of failure.

Contemporary studies reinforce that the clinical performance of restorations
Adhesive cementation is superior when the adhesion protocol is correctly applied.
(PEUMANS et al., 2019; FRANKENBERGER et al., 2020). On the other hand, cements
Conventional methods still guarantee satisfactory results in metal-ceramic applications, and are preferred.
in cases of multiple elements and subgingival margins (HILL; LOTT, 2011).

CONCLUSION

Analysis of the literature demonstrated that adhesive cementation offers better results.
Results in metal-free ceramic restorations, promoting greater retention and sealing.
Marginal strength and fracture resistance. Conventional cements continue to exhibit excellent...
Performance in metal-ceramic prostheses with adequate mechanical retention.

The studies analyzed showed that the clinical success of restorations does not depend on...
It's not just about the cement used, but also about the appropriate clinical protocol and monitoring of...
moisture and geometry of the dental preparation. Despite the greater technical sensitivity, the cements
Resin-based materials offer superior aesthetic and mechanical advantages.

Cementation is a crucial step for clinical success and longevity of...
fixed prostheses, directly influencing factors such as retention, marginal adaptation, and
Fracture resistance and biomechanical stability of restorations. Based on the analysis of
Literature shows that both conventional cements and adhesives exhibit
specific clinical indications, advantages, and limitations that should be considered.
individually in each case.

Conventional cements continue to demonstrate satisfactory clinical results.
primarily in metal-ceramic prostheses and in preparations with adequate mechanical retention,
Distinguished by its operational simplicity, clinical predictability, and lower sensitivity.
technical. However, they have limitations related to the lack of effective chemical adhesion.
to the dental substrate and greater susceptibility to solubility in a moist environment.

On the other hand, adhesive cementation has shown superior performance in restorations.

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Metal-free ceramics, especially due to their ability to promote bonding.

micromechanical and chemical interactions between the cement, the tooth, and the restorative material. In addition to promoting

With greater retention and marginal sealing, adhesive systems contribute to a better...

Stress distribution and increased fracture resistance of ceramic restorations.

However, the clinical success of these systems depends directly on the correct implementation of the

adhesive protocol, including proper conditioning, silane application, and control.

strict humidity.

Therefore, it can be concluded that there is no universally ideal cementing system.

It is essential that the choice of cement is based on the characteristics of the material.

The restorative aspect depends on the type of preparation, the clinical conditions, and the professional's experience.

Correct indication and execution of the cementation technique are essential to ensure the

Predictability, aesthetics, and longevity of fixed prostheses.

REFERENCES

BLATZ, MB Long-term clinical success of tooth-colored restorations cemented with self-adhesive resin cements. Journal of Adhesive Dentistry, vol. 19, no. 5, p. 403–410, 2017.

BRONDANI, LP et al. Cementation strategies in fixed prosthodontics: a review of clinical principles. Journal of Prosthetic Dentistry, vol. 118, no. 3, p. 268–275, 2017.

DE LA MACORRA, JC; PRADÍES, G. Dental cements and adhesives: biological and clinical requirements. Clinical Oral Investigations, v. 6, n. 4, p. 204–212, 2002.

FRANKENBERGER, R. et al. Long-term success of adhesive cementation in fixed prosthodontics. Dental Materials, vol. 36, no. 5, p. 620–633, 2020.

GHODSI, S.; HAGHDOOST, S. Review of contemporary resin cements: composition, properties, and clinical considerations. Journal of Esthetic and Restorative Dentistry, vol. 35, no. 2, p. 215–225, 2023.

HILL, EE Dental cements for definitive fighting: a review—Journal of Prosthodontics, v. 16, no. 1, p. 21–28, 2007.

HILL, EE; LOTT, J. Cementation of indirect restorations: the state of the art. Journal of Esthetic and Restorative Dentistry, vol. 23, no. 1, p. 44–56, 2011.

KURARAY NORITAKE. Panavia resin cements: a technical guide for clinical application. Kuraray Noritake Dental Inc., Tokyo, 2021.

PEUMANS, M. et al. Clinical performance of adhesive luting agents for ceramic restorations. Journal of Dentistry, vol. 85, p. 77–86, 2019.

SHILLINGBURG, HT et al. Fundamentals of Fixed Prosthodontics. 5th ed. Rio de Janeiro: Elsevier,

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2012.

SILVA, RF Clinical and laboratory evaluation of cementing agents in restorative dentistry— Brazilian Journal of Dentistry, v. 78, n. 2, p. 101–110, 2021.

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