

27.

Selecting Ceramics - Introduction

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AIM OF PRESENTATION: To compare a number of materials for extracoronary restoration of teeth with particular reference to CAD-CAM ceramics.

CASE DESCRIPTION AND TREATMENT CARRIED OUT: This paper will be illustrated using clinical examples of patients treated using different ceramic restorations to present the advantages and disadvantages and each technique. The different requirements of tooth preparation, impression taking and technical procedures of each system will be presented and compared.

PATIENT PROGRESS: Follow up clinical observations of treated patients will be reported and discussed.

28.

Procera Allceram: Two Year Evaluation of the Fixed Partial Denture

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INTRODUCTION: The demand for all-ceramic restorations has increased substantially because of their esthetics and biocompatibility. However, the indication for a fixed partial denture has been limited by numerous problems such as low breaking strength of conventional dental ceramic and complex manufacturing techniques. Procera AllCeram is a CAD/CAM system for complete ceramic restorations with a dry-sintered high-purity aluminium oxide core. **Purpose:** The aim of this study was to determine whether the Procera ceramic fixed partial denture is an acceptable treatment modality. **Material and methods:** Nine patients were treated with a total of ten fixed partial dentures of three units. The restorations were constructed with bilateral support and one pontic, according to the Procera AllCeram technique. The California Dental Association quality evaluation system was used for assessment of marginal integrity and esthetics after two years.

RESULTS: Nine of ten fixed partial dentures (90%) showed no defects and were functioning well after two years.

No caries or signs of gingivitis or periodontitis exceeding those found.

CONCLUSION: The study confirms that for the observation period of two years, fixed partial dentures made by the Procera AllCeram method seem to be an acceptable treatment alternative.

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Comparative Microstructural Study of the Diffusion Zone Between Ni-Cr Alloy and Different Dental Ceramics

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Detailed knowledge of bonding mechanisms, between the metal and ceramic parts in conventional dental systems, can help the development of new, improved systems and the optimisation of recent technologies. Despite their allergic potential, the NiCr alloys are still amongst the most often used dental materials so their investigation is important. The aim of the study was to carry out a detailed microstructural investigation and to compare the reaction layer developed between three different dental ceramics and NiCr alloy under different firing conditions.

For the measurements six identical samples were cast from WIRON 99 (Bego, Konstantz, Germany) alloy. Ceramic opaques were fired on the polished surface using Vision (Wohlwend AG), Vita VMK 95 (Vita) and Carat (DeTrey/Dentsplay) materials. Two samples were produced from each type of opaques by different firing conditions. The TEM investigations were performed by using a 2000FX-II microscope with a Link-Isis EDS system.

Similar growth processes of the phases were observed in all of the investigated systems in the sense that an amorphous phase was formed on the metal-ceramic interface producing bubble like inclusions on the metal surface. The main component of this phase is silicon oxide in the case of Carat and Vita ceramics, while in the case of Vision potassium and nickel oxides were observed after the normal firing process. In all systems and at all firing conditions a nanocrystalline Cr₂O₃ layer (with about 50 nm grain size) was commonly observed.

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