

Abrasion in fissures was visible in the scanning electron microscope. The cusps were well formed. Two fractures of the ceramic layer were observed. A significant increase in the position of the gingival margins was found, and varied from 45.0 μm to 108.3 μm vestibular 89.1 (SE 12.1) to 63 μm oral (SE 7.0).

81.

Estimation of Wear Resistance in Acid Solution of Dental Ceramics by Neural Network

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It is known that exposure to acid causes damage to the glass surface. The aim of this study was to examine wear resistance, measuring the mass change of dental ceramics after contact with 10-3 mol dm⁻³ HCl at temperature of 50°C. Four samples of dental ceramics were analyzed: feldspatic ceramic, hydrothermal ceramic, glass ceramic for staining and glass ceramic for layering. The mass concentrations of eluted Na⁺, K⁺ and Ca²⁺ were determined by ion chromatography (IC) and mass concentrations of Si⁴⁺ and Al³⁺ by UV/VIS spectrometry. Measurements were conducted after 1, 2, 3, 6 and 12 months of emersion.

For the subject issue, using experimental data, the feedforward backpropagation neural network for estimation of wear resistance of dental ceramics was modelled. The results of 1, 2 and 12 months of emersion were used for the training 13-20-5 model of neural network. Comparison of experimental data and data obtained by estimation (results of 3 and 6 month intervals) of neural network shows that the applied network model provided a very good prediction of wear behavior of dental ceramics with high correlation coefficient (R) and low sum of squared error (SSE) between measurement and estimated output values.

82.

A Clinical Report of the Shaping of a Lateral Metal-Free Bridge Made of Vita In-Ceram Zirconia

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Because of some aesthetic imperfections and because metal is unsuitable for some patients, metal-free ceramic has been developed. A patient, 50 years old, is presented with a 6 year old faceted bridge on teeth 24, 25, 26, 27. The patient complained of thermal irritation in the cervical region. A clinical examination showed gingivitis and lack of hygiene. Between the toothsegment 26 and the crown on 27 was a fracture, and the patient decided to have a new bridge made. A metal-free ceramic bridge made of Vita In-ceram zirconium was suggested as well as treatment of the periodontium by the Durr Vektor method. The teeth region 24 and 27 were anesthetized with local infiltration anesthetic. Silicone impression for a temporary bridge was taken. Using the separatory bur in the red contra angle Titan TE 200 crowns 24 and 27 were separated and pulled with special dental forceps. Before beginning the preparation it is necessary to put the retraction thread in two levels circularly round the stump in the gingival sulcus to prevent bleeding. The 2 mm of the tooth crown depth is marked by a diamond bur. Labial and palatal it is done with a special grooved diamond point LVS-1 with 1.2 mm grooves. The tooth is treated in the following order - occlusally, labially, approximately and palatally. At the same time a 0.5 mm rectangular step inside the sulcus is prepared. Finally the rims of the step and the stump are treated with Titan Eva-head TK 14 with 0,4 working amplitude and a maximum of 6000 r.p.m. The final treatment with Arkansas stone follows. The thread is removed and the impression in the additional silicone or polyether is taken. The relation between the jaws is estimated with the silicone key. The acrylic temporary bridge is made directly in the mouth and is cemented with temporary cement. The ceramic-free construction is cemented by adhesional technique.