30.

Casting and Mechanized Titanium Restorations

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INTRODUCTION: New materials and methods for clinical dentistry are continuously being introduced. There is a growing interest in the use of titanium as a restorative material for several reasons: its relatively low cost, favorable physical properties and biocompatibility. However, titanium is technically more difficult to handle than conventional metal alloys. There are two fabrication methods for titanium restorations: casting and mechanized (a combination of machine duplication and spark erosion-Pro--cera method).

PURPOSE: The aim of this review was to evaluate the advantages and disadvantages of the two fabrication methods used for titanium restorations and to make some recommendations on the indications.

MATERIAL AND METHODS: Dental literature was reviewed including clinical and technique articles on the use of titanium in prosthodontic restorations.

RESULT: The use of mechanized titanium has more restrictive indications than casting, but assures better marginal fit of the restorations. The bond strength of porcelain fused to titanium is questioned, because of the lower rigidity of titanium than conventional alloys and discrepancies in the thermal expansion coefficient between titanium and ceramic. Thus, low fusing ceramics tend to predominate today. The esthetic result varies. Furthermore titanium restorations require a qualified dental technician.

CONCLUSION: It can be concluded that titanium is a promising alternative for prosthodontic restorations. Several error sources associated with casting can be eliminated with mechanized titanium restorations. However, little information is availableon the clinical performance of titanium restorations. More clinical prospective studies are necessary before titanium can be recommended for general clinical use.

31.

The CAD-CAM System in the Construction of a Telescopic Prosthesis Over Six Implants

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INTRODUCTION: The CAD-CAM system provides the posibility of making titanium framework with great precision and without deformations which can take place in clinical technigues.

AIM OF THE STUDY: The objective was to analize, through a clinical case, the use of the ALL-IN-ONE system.

MATERIAL AND METHODS: In a female patient, 50 years of age, we installed six osteointegrated implants in maxillary bone. After the integration period we decided to contruct a telescopic prosthesis with the All-in-one system due to the inclination of the implants.We took impressions by a method that splints together the abutments. Withthe model obtained we made a primary structure in titanium, compensating the vestibular direction of the implants, and over this primary structure we made a secondary telescopic metal structure, designed with the dental shape, that was obtained by frictional means and the use of three “Ipso-clip” retainers.

RESULT: The CAD-CAM system seems to be an excellent system for providing a good fit in complex metal frameworks from the clinical point of view.

32.

Effect of Intraorally Used Surface Treatment Methods to Improve Resin Composite Bond Strenghts

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The use of resin composite restorations might require repairs to prolong the service life of such restorations. The aim of this study was to evaluate the effect of 3 surface treatment methods on the shear bond strength (SBS) of a

particulate filler resin composite (PFC) to 5 PFC substrates, namely Targis (Ivoclar), Sinfony (3M ESPE), Tetric (Vivadent), Gradia (GC), Sculpture (Jeneric Pentron) in dry and thermocycled (TC) conditions. PFC substrates were fabricated according to each manufacturer's recommendations and the oxygen inhibition layer was removed by grinding. The substrates in each group (n=6) were randomly assigned to each of the following 3 treatment conditions: (1) Etching for 90 sec with 9.5% HF (Ultradent® Porcelain Etch, USA) (2) Sandblasting (50μm Al_2O_3), (3) Tribochemical silicacoating (CoJet, 30μm SiOx, 3M ESPE). Each surface treatment was followed by silanization and bonding agent application. The repair resin (Sinfony, 3M ESPE) was bonded to the conditioned substrates using teflon tubes (3.6 x 5 mm). TC was applied for 6000 cycles (5-55ºC, 30 sec). The SBS were measured in a universal testing machine with a cross-head speed of 1mm/min. The ANOVA showed that SBS values before TC differed significantly ($P<0.001$) between the acid etched specimens (7.5-14.5 MPa) and those treated with either Al_2O_3 (15.9-20.8 MPa) or silicacoating (25.8-42.2 MPa). After TC, the silicacoating process resulted in the highest values in all material groups (17.3--30 MPa). The results indicate that composite resin repair strengths are dependent on the brand of the composite. This could be due to the differences in chemical composition of the polymer.

33.

The Problem of Solving Fracture of the Denture Base in Preedentulous States

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The mechanical fatigue resistance of the denture base seems to be a neglected part of treatment planning. Extreme overload can occur, which is only evaluated in the case of fracture. In full or partial edentia the dental base can be exposed to an extreme stress concentration which may be coupled with the incidental source of failure during processing of the denture.

The aim of this lecture is to report cases, where we were able to overcome dental base fracture, which had not been foreseen earlier.

In the first case a history of several fractures of an upper complete denture is presented. Metal net, framework and incorporation of glass fibres and reline were stages of the instructive problem solving process.

In the second case a man wearing an overdenture with ball attachments under implant fixtures is presented. After multiple fractures of the dental base we used glass fibre reinforcement for repair. After this procedure there was an eventless period, which proves the mechanical resistance of the denture base.

In the third case presented both the denture base and the acrylic tooth were damaged. The multiple fracture could also be treated with glass fibre reinforcement, which was successful.

From these cases we concluded:

1. Careful case history and treatment plan could have helped to overcome the subsequent problems.
2. The clinical implication is that the glass fibre reinforcement can provide effective strength for the denture base. We could not neglect evaluation of the mucosa and bone support.

In the following period we reinforced new dentures preventively with fibres in 15 cases. At the same time we also continued the repair the broken dentures of 10 patients. The outcome exceeded our greatest expectations: no fracture was seen. However, further study is needed to extend the observation period.

34.

Investigation of the Fracture Surface of E Glass Fiber Reinforced PMMA Denture Base Resins

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The interface between fibers and the acrylic resin matrix is considered to be an important factor in the reinforcement, and the microscopic surface structure may play a key role in the effectiveness of this reinforcement. Adequate adhesion of the fibers to the polymer matrix is one of the most important factors for strength. The optic microscope, although of limited resolution, is still a popular choice. The scanning electron microscope (SEM) provides measurements in 2 dimensions.

The aim of the study was to examine the interfacial region of PMMA reinforced with chopped glass fibers