A series of implants connected with abutments composed of two parts were analysed.

The results of initial studies utilizing the finite element analysis (FEA) allowed definition of the spheres of stress concentration. On the basis of *in vitro* experiments, the investigators evaluated the influence of tolerance of adapted implant-abutment interface fit, as well as the torque used in the assembly of the abutment, on the occurrence of micromovements and loosening of components. The results strongly indicate correlation between the chosen variables and the risk of occurrence of mechanical complications.

37.
Effect of Long-Term Cycling Load for Abutment Screw Fixation in Implant Prosthodontics

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The aim of this *in vitro* study was to use rotational tests on commercially available abutment screws to evaluate their potential for preload generation and to follow changes in torque by using newer fixation geometry on the interface of the implant-abutment screw joint. Five identical implant/abutment assemblies were chosen from each of the following systems: external hex with standard abutment and Replace with TorgTite screw (Nobel Biocare), Camlog universal abutment (Altatec Biotechnologies), DenTi internal hex (Dentimplant Ltd. Szentes, Hungary), straight abutment with internal antirotational element (Uniplant, Sinalisal, Budapest).

Wax patterns of the upper premolar were performed and then cast from nickel-chrome alloy and full crown castings were cemented on abutments. In a test machine the magnitude and time of chewing function was predefined by using the desired force pattern. Each specimen was stressed for cycles equivalent to an intaoral load of 5 months or longer timescale.

In the static test greater loss in torques was calculated for standard Branemark and Replace screw joints. Assuming that the optimum proportion is the same when we calculate loosening versus tightening torque we obtained a decrease between 0.70-0.59 for Replace and Branemark abutments and a more moderate loss of between 0.90-0.84 for the other systems investigated. The ten month equivalent cycling test produced a loosening torque of 16-17 Ncm for Branemark and Replace abutments. Similar decrease in torque was not found for the other three systems. It was concluded that different approach in achievement of necessary mechanical integration can be seen in implant systems, although a reliable loosening torque could be measured after a longer time scale.

38.
A Different Impression Technique for a Single Tooth Crown Over the ITI Implant

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The single tooth implant has common use in the field of implant dentistry and many studies report high success rates. Improvements in implant design, range of prosthetic components and restorative materials have made it possible to achieve optimal cosmetic results, although tissue contouring problems may sometimes limit optimum aesthetics, especially in the anterior maxilla. This case report describes a different impression technique, by using zinc-oxide eugenol impression paste, to take a precise impression of the periimplant tissues around the subgingival part of the ITI implant, to achieve an optimal cosmetic effect.

39.
Surface Modification of Titanium Dental Implants by Excimer Laser

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The perfect osseointegration process of the dental implants depends among other factors on the surface characteristics of the titanium. In this study enlarged mechanical roughness was produced by a laser-based technique, in order to decrease the healing period of the implant.

There are different ways of forming laser induced surface structures. In the case of mask projection techniques the surface can be modified in larger areas and surface patterns. An ArF nanosecond excimer laser was used in the experiments because of the advantageous properties of the excimer beams. Effective polishing by homogeneous laser illumination in the 3-5 J/cm^2 fluence range was performed as confirmed by SEM and AFM studies. Holes of about 20 mm diameter and 10 mm in depth, with high aspect ratio and protrusions around the edges were ablated into the titanium surface with subsequent pulses of ns ArF excimer laser. To avoid easily breakable protrusions we applied excimer pulse durations of 0.5 picoseconds. In this case we obtained melting- and ridge-free ablation of titanium. The laser treatment influenced the chemical composition of the surface in two respects. On the one hand it removed carbonaceous contamination as indicated by XPS and XRD measurements, demonstrating that cleaning of the surface does not alter the original crystalline structure. On the other hand, XPS measurements proved that pulsed laser oxidation in air increased the thickness of the surface oxide layer, promoting better osseointegration.

40.

Porcelain-Fused-to-Titanium Restorations From Implant Level -- Preliminary Observations

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Until a few years ago use of the abutment was necessary for making fixed restorations retained on Branemark implants. For multiple-unit restorations, abutments served as a"misfit eliminating zone" for the framework cast with gold alloy. Single crowns were made as restorations cemented on prefabricated abutments. Thanks to the use of modern laboratory methods, it is now possible to produce multiple-unit restorations retained directly on implants with the metal part made of titanium alloy. One such method is the All-in-One system, in which the metal part of the restoration is made of one piece of titanium, with the use of a computer aided milling machine. Thanks to the development in porcelain fusing to titanium, it is also possible to make single crowns as a screw-retained restoration seated directly on an implant. For this purpose, TiAdapt abutments were used with own modification of UCLA-type crown production.

The paper describes some advantages and disadvantages of the above mentioned systems and basics of their use.

The study group consisted of 22 restorations (12 bridges and 10 crowns) made for 14 patients. Most of them (18) were made for the lower jaw. All bridges were two- or three-unit restorations. The observation period was from three months up to two years. Complications were observed in two cases. Both of them consisted of cracks in the porcelain. Due to the design of the restorations, the complications were eliminated without any problems. A possible cause of the porcelain cracking was the excessive bulk of the porcelain in areas where there had been lack of metal support for the veneering layer.

Due to the easy application and positive aesthetic and functional results the described methods seem to be worth recommending, with some clinical limitations.

41.

Three-Year Clinical Evaluation of in Ceram Zirconia Bridges.

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INTRODUCTION: The demand for esthetic restorations has led to the development of materials that are metal free. These materials must have adequate strength to be an alternative for the fabrication of fixed partial dentures in posterior segments of the dental arches.

PURPOSE: The aim of the present study was to investigate in a long-term perspective whether the strength of the In Ceram Zirconia material is sufficient for use in posterior bridges.

MATERIAL AND METHODS: Sixteen patients, who were between 23 and 50 years of age, with indications for a fixed denture replacing premolar or molar, were examined for participation in the study. Eighteen bridges were constructed with one or two pontics and two abutments, one on each side of the pontic. The patients were informed about risks of, and alternatives to, the proposed therapy. The supporting teeth were prepared with chamfer finish line and lack ofsharp line angles. Impressions were made with a rigid standard tray with an A-silicone putty soft and light-body materials (Aquasil, Dentsply). The laboratory procedures were performed by a laboratory autho-