4.5 Department of Prosthodontics

**Mission and Structure**

The Department of Prosthodontics with its 37 employees is one of five Departments at the dental school of Würzburg University. Its fields consist of education of both pre-med and med dentistry students and all aspects of prosthetic and restorative dentistry for ambulant patients, which comprise traditional treatment such as fixed and removable partial dentures to contemporary concepts using metal-free and implant-supported perioprosthetics, orofacial prosthetics, adhaesive restorations and therapy of patients with myofacial pain and TMJ-disorders.

**Major Research Interests**

Clinical and in-vitro studies on dental implantology are prominent subjects in the field of research with focus on improvement of implant design, e.g. special cortical threads in the neck-area of the implant and their consequences on bone-regeneration and -durability. An additional area of research is the debit of in line standing connected and unconnected implants. Furthermore, so called “index implants” and temporary implants are under development. Over the course of the past ten years strategic implants in combination with removable dentures as well as angulated implants have stood in the light of clinical interest.

Experimental studies and finite-element simulations have led to the development of the “Wuerzburg Post”, which is now available for clinical use and is being evaluated in a long term clinical study. It rests on a revolutionary approach – “inverse conicity” and an annular groove – in which the causes of hardly unavoidable longterm failures (e.g. decementation of the restoration or radicular fracture) associated with conventional post and core systems are eliminated.

The construction is designed to permit a wide-based support of the restoration on the coronal root surface while requiring only a small depth for anchorage, which is achieved by means of positive locking by a specially designed, spreadable post. The apical and middle part of the root are no longer subject to weakening, fracture of the root or decementation of the post are no longer possible. Masticatory forces are transmitted into the dentin through an annular groove and a corresponding ferrule. The Wuerzburg Post is available in two versions for FPDs or RPDs.

The clinical experience with over 95 inserted posts reflects excellent results as the survival rate is in excess of 97% within a maximum period of observation of 24 months.

An interfaculty task force (Department of Experimental Physics V) supported by the industry (Prokuro GmbH, DeguDent-Dentsply) is engaged with the forward looking technology of digital scanning of teeth as well as the production of dentures/dental restorations by avoiding the flaw-associated interaction between impression taking and traditional dental techniques. The digital procedures used so far are based on the optical scanning of teeth which were prepared by the dentist for in- and onlays, whereat the perpa-

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*Fig. 1: (a, left) X-Ray of two angulated implants which were inserted under atrophic bone levels without augmentation. (b, right) Fixed partial denture supported by one tooth and an angular implant.*
Fig. 2: (a, left) Speadable bur for the undercut cavity. (b, right) FE-Simulation, horizontal angle of attack.

Incorporation margins lie above the gingiva in the enamel. Typically, these procedures are limited to one tooth. The dental MRT is an alternative to conventional digital methods as it is suitable for all aspects of restorative dentistry under given circumstances, and exhibits considerable potential for the diagnostic of caries as well as all other aspects of general dental diagnostics.


