

**Danube Private University Krems
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**PRIMARY IMPLANT STABILITY AND IMPLANT STABILITY
QUOTIENT MEASUREMENT**

Masterthesis

A Thesis submitted by

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DEDICATION

I dedicate this manuscript to the bright memory of my grandfather Dmitro Hodz who taught me the value of hard work and self-discipline.



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1 Introduction

It is a popular concept among dental specialists when a dental implantation is considered a two-stage surgical procedure. According to this concept a tooth extraction is followed by a 3- to 6-month long healing period. After a healing period an implant is inserted into the region of the missing tooth and is covered by full thickness gingival flap to fully integrate. Integration of an implant takes some more month before implant is finally loaded. This concept is based on the theoretical assumption that the forces applied on the implant after implantation will interfere with the osseointegration process.

However, the above-mentioned concept is not scientifically supported. Furthermore, this concept is not clinically justified in many cases. For example, after tooth extraction, adjacent teeth and teeth on the opposite arch are prone to move toward the space of an absent tooth (or teeth), thus creating disorders of occlusion. Additionally, temporary dentures may cause trauma and inflammation of soft tissue which impede osseointegration process of an implant. More than that, preparation of neighbouring teeth for a temporary non-removable prosthesis is highly undesirable for its aggressive nature.

Clinical reality brings the need for less traumatic, less time-demanding and more patient-oriented solutions which would not compromise integration and future function of a dental implant. The need for a “faster implant” materialises in concepts of immediate and early loading of implants. Still, it is crucial to keep in mind that success of these concepts depend greatly on use of correct implantation techniques and dental materials (implants) of “certain philosophy”.

When using protocols of immediate or early loading the topic of utmost importance is measurement of implant stability. A popular standard for measuring primary implant stability is torque measurement – insertion torque and removal torque measurements. Insertion torque test (ITT) and removal torque test (RTT) are simple techniques which can be done by an operator with a ratchet provided in almost every implantation set. One of the alternatives to tests mentioned above is

a method based on resonance frequency analysis (RFA). Great effort was put in development of RFA in the last 15 years and this method is advocated to be a precise and reliable method for assessing primary implant stability.