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**Soft Tissue Healing and Soft Tissue Barrier Around Oral Implants**

D. Bosshard

University of Bern, Bern, Switzerland

The surface properties are a key factor in the osseointegration of dental implants. Modern implants are integrated into newly formed bone within a few weeks. Despite major advances in biomaterial research, peri-implant mucositis and peri-implantitis are a reality and unfortunately not rare diseases. The success and survival of dental implants therefore do not depend solely on osseointegration. The peri-implant mucosa, which lies between the bone and the oral cavity, represents an important biological barrier. It is assumed that an intact soft tissue barrier around implants ensures healthy conditions and thus the long-term survival of a dental implant. While the soft tissue seal around teeth develops during tooth eruption, the peri-implant mucosal barrier forms after the formation of a wound in the oral cavity. Healing of the soft tissue around dental implants follows a similar pattern to other soft tissue wounds, beginning with coagulation and followed by inflammation, granulation tissue formation, and the formation of soft connective tissue and epithelium. After 6-8 weeks of healing, a mature barrier (junctional) epithelium forms, which may indicate the establishment of a fully functional mucosal seal around dental implants. This mucosal seal consists of two main components: the attachment to the implant and the defense mechanisms within the barrier (junctional) epithelium. Both are considered essential for the maintenance of health, but little is known about how the epithelial cells adhere to the implant and how the surface properties of the implant influence this adhesion. While much is known about epithelial attachment and the barrier function of the junctional epithelium in the gingiva around teeth, almost nothing is known about this attachment to dental implants. One reason for this lack of information is the difficulty in obtaining the actual interface in histologic sections and the limitations of analytical histological techniques when the implant remains in place.