

# Basic Concepts and Techniques of Dental Implants



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## KEYWORDS

• Implants • Implant surgery • Patient assessment • Basic implant concepts

## KEY POINTS

- Dental implants provide a predictable, effective, and reliable means to replace dentition.
- Dental implants provide completely edentulous and partial edentulous patients the function and esthetics they had with natural dentition.
- It is critical to understand and apply predictable surgical principles when treatment planning and surgically restoring edentulous spaces with implants.
- Basic implant concepts should be meticulously followed for predictable results when treating patients and restoring dental implants.

## IMPLANT BASIC CONCEPTS

Dental implants provide a predictable, effective, and reliable means for tooth replacements. Additionally, dental implants provide completely edentulous and partial edentulous patients the function and esthetics they had with natural dentition. It enables patients to regain normal masticatory function, esthetics, speech, smile, and deglutition. In patients with orofacial pain, it may resolve painful symptoms as well as improve facial esthetics and appearance. Edentulous patients gain a feeling of higher self-esteem and well-being. In patients with craniomaxillofacial defects, implants can be used to replace ears, noses, eyes, and other maxillofacial defects. Moreover, congenital, traumatic, and developmental oral defects can be treated with implants.

## BIOLOGICAL AND FUNCTIONAL CONSIDERATIONS

Osseointegration is the primary goal of implant placement. In 1952, Brånemark began extensive studies on the microscopic circulation of bone marrow healing. These

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The authors have nothing to disclose.

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Dent Clin N Am 59 (2015) 255–264

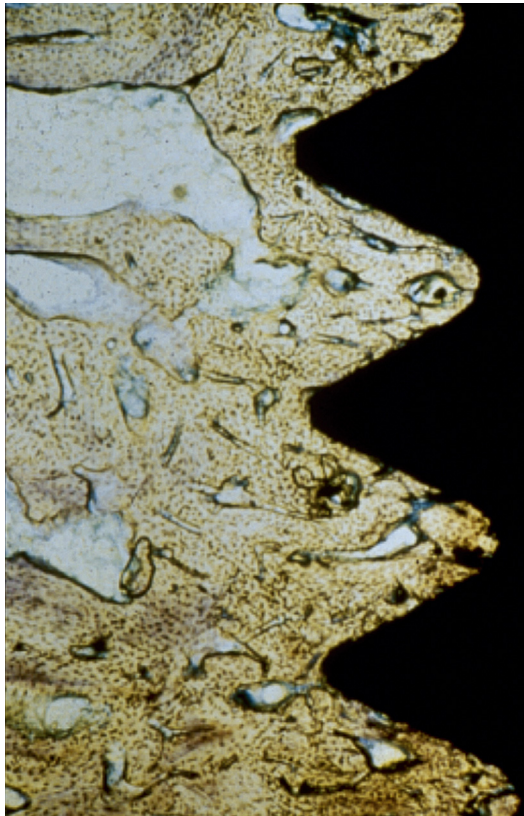
<http://dx.doi.org/10.1016/j.cden.2014.10.005>

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studies led to a dental implant application in the early 1960s in which a 10-year implant integration was established in dogs without significant adverse reactions in the soft and hard tissues. Osseointegration can be defined as the direct structural and functional connection between organized, living bone and the surface of a load-bearing implant without intervening soft tissue between the implant and bone.<sup>1</sup> Clinically, osseointegration can be defined as the asymptomatic rigid fixation of an implant in bone with the ability to withstand occlusal forces.<sup>2</sup> Rigid fixation is a clinical term that implies no observable movement of the implant when a force of 1 to 500 g is applied (**Fig. 1**).

Advancements in biomaterials, implant science, and nanotechnology; improved biotechnology; and an understanding of the bone–implant interface have resulted in improved outcomes and an expanded utilization of implants. Improved imaging techniques help aid in diagnosis; a varied availability of implant geometries, surfaces, and refined surgical techniques has made it possible for most healthy patients to receive implants. Numerous materials are available to aid in bone regeneration in the maxillo-facial region, including bone substitute composite grafts and autogenous bone. These tissue types involve the key concepts of osteogenesis, osteoinduction, osteoconduction, and osteopromotion (**Boxes 1 and 2**).



**Fig. 1.** Osseointegration, as coined by Brånemark, describes a direct bone–implant interface under the power of a light microscope. (From Misch CE. *Generic root form component terminology*. In: Misch CE, editor. *Dental implant prosthetics*. St Louis (MO): Elsevier Mosby; 2015; with permission.)

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