

Osteopromotion to enhance bone volume in implant rehabilitative therapies: An insight

Sir,

The ultimate goal of modern dentistry is to restore the stomatognathic system to normal function, comfort, esthetics, speech, and health regardless of the atrophy, disease, or injury. Traditional implant therapy is aimed at the placement of osseointegrated implants into a preoperatively planned bone site having a minimum width of approximately 6 mm. This minimum buccolingual width is a safe margin to maintain the integrity of the bone and to enhance growth of the bone next to the surface of the implant. Insufficient volume of bone at the time of surgery will result in an exposed surface of implant with loss of bone contact area. The surface of the implant designed for bone contact will then be covered with connective tissue and can lead to mucosal irritation and decreased success of the implant.^[1]

Various techniques with grafting procedures have been used for the treatment of exposed surfaces of implants with varying degrees of success and little predictability for formation of new bone. Regenerative techniques using membranes have been introduced recently, and these provide a more predictable method for inducing formation of new bone. Regeneration of bone with membrane techniques is based on the hypothesis that different cellular components in the tissue have varying rates of migration into a wound area around a dental implant.^[2] Using a membrane technique, the blood clot is protected from the pressure of the overlying tissue, and fibroblasts from the connective tissue of the flap are restricted from entering the bone defect. This technique allows the population of cells from the surrounding bone to predominate during the healing of the osseous defect.

Human clinical applications of this method have shown encouraging results, and clinical situations such as dehiscence-, fenestration-, and extraction-type defects have been successfully treated. Potential applications for the guided bone-regeneration technique include localized ridge augmentation prior to placement of the implant, treatment of peri-implant bone defects around functioning implants, and use in the lateral opening of the sinus-lift procedure. As a

result of the positive experimental and clinical outcomes of the membrane therapy, there is an increasing indication for the placement of implant in sites previously thought to be unsuitable. The biologic process of bone formation is based on a protected, richly vascularized wound, with an adequate development of space between the implant and surrounding bone. The ability of these techniques to cause formation of bone over dehiscence and extraction sites is well established, but whether a significant amount of bone grows into close contact with the surface of the implant is more uncertain. Primary closure of tissue flaps over membranes is important to assure a continued, uneventful healing. Exposure or removal of membrane during the healing period is detrimental to predictable osteogenesis.^[2] Exposed membranes show an increased risk of infection and can result in loss rather than enhancement of bone. Consequently, a modified surgical protocol emphasizing tension-free closure of tissue over the membrane site should be followed. An important factor for the guided bone regeneration technique is the length of the healing time. The exact minimum time to regenerate osseous tissue is still unknown and probably varies with patients and selection of site.

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