Guided Bone Regeneration and Guided Tissue Regeneration Techniques in Periodontal Disease

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Description

In oral surgery, periodontal disease is a frequently caused condition, especially in the tissues that support the teeth (gums, periodontal ligament, alveolar bone, and cementum). One of the main reasons for adult dentition problems is high incidence rate of gingival swelling and bleeding, which has a negative impact on patient's quality of life. Periodontal illnesses include gingival disease and periodontitis, and can result in the significant clinical manifestation known as the periodontal intraosseous defect. It can result in periodontal attachment loss, alveolar bone resorption and deformity, teeth loosening, and even tooth loss if left untreated. Patient's masticatory function and visual appeal are affected by periodontal bone abnormalities, which also increase their physical and mental strain.

As a result, the therapy of periodontal disease should concentrate on removing the infection's source and any local stimuli, as well as on fixing any damage to the periodontal tissues and restoring their standard morphology and function. Both hard and soft tissues can be repaired by the human body as it is a biologically normal occurrence. The majority of tissue will mend itself within biological restrictions. Regeneration, on the other hand, is a different story; in the vast majority of cases, when tissue loss has taken place, the tissue is unable to return to its pre-loss condition. Birth abnormalities, disease, trauma, cancer, atrophy, or surgical excision can all cause tissue loss.

Classification of Regeneration Techniques

At the hard and soft tissue interfaces, the grafting material should be biocompatible with the host receiving the transplant. The host tissue has the ability to harm the graft and can reject it. The objective of the grafting material and the application process must be decided by the doctor. The procedure's technique and the material's classification will affect the outcome. Guided Bone Regeneration (GBR) and Guided Tissue Regeneration (GTR) are two categories of regeneration.

While Guided Bone Regeneration (GBR) is sometimes referred to as ridge augmentation or bone regenerative operations, whereas Guided Tissue Regeneration (GTR) can be described as procedures that try to repair damaged periodontal structures by differentiating tissue responses. Periodontal attachment regeneration is the most common example of guided tissue regeneration. Using expanded polytetrafluoroethylene, polyglactin, polylactic acid, calcium sulphate, and collagen as barrier materials, it is expected to keep gingival corium and epithelium away from the root or existing bone surface as it is supposed to obstruct the process of regeneration. Similar ideas of replication or rebuilding of a lost or damaged portion are included in both GBR and GTR.

The goal of bone grafting is to restore the anatomical shape of the alveolar bone and the functionality of the periodontal tissue by transplanting materials (bone or bone substitutes) to treat periodontal abnormalities. The goal of periodontal attachment is to establish a complete periodontal tissue, including the cementum, periodontal ligaments, alveolar bone, and connective tissue attachment. Treatments that can successfully encourage periodontal tissue regeneration and improve periodontal attachment are currently one of the hot topics in the management of periodontal intraosseous defects. By retaining bone or bone substitutes, bone grafting is a technique to raise the growth of new bone and repair the alveolar bone deficiencies carried on by periodontitis.

Melcher proposed Guided Tissue Regeneration (GTR) in 1976, and was applied in periodontal surgery. Different tissues are separated by surgery using a collagen membrane, which serves as a physical barrier. In order to achieve the attachment and proliferation of the damaged periodontal area, GTR can then selectively direct the periodontal regenerated cells to grow back to the damaged area based on the mechanical barrier of the membrane.

Currently, clinically speaking, patients with a few reserved teeth and patients with bone reserved for future restoration may be candidates for GTR when the thickness of the buccal bone plate in the alveolar socket is less than 1.5 mm-2.0 mm (mostly located in the anterior aesthetic area) and there are multiple bone wall defects or missing in the alveolar socket.

Conclusion

According to a substantial number of studies in the literature, the GTR is an established and reliable method for vertical bone increase. The impact of GTR regenerative procedure when combined with bone grafting in treating patients with periodontal intraosseous defects seems to be very effective when compared to patients who received the treatment of bone grafting alone. GTR combined with bone grafting has a great outcome and it successfully support the reconstruction and recovery of periodontal intraosseous defects. Additionally, it can greatly enhance the patient's gingival aesthetics, which has considerable clinical value.

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