Basic Mechanism and Clinical Application of Guided Tissue Regeneration

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Different surgical approaches have been advocated in the management of periodontal disease defects. One approach involves surgical reduction of gingival tissue contour and resection of adjacent alveolar bone to eliminate or reduce the defects. A contrasting approach would be resolution by regeneration of alveolar bone and periodontal attachment.

The hypothesis originated by Melcher and established by Karring et al. suggests that selected cell populations residing in the periodontium can produce new cementum, alveolar bone and periodontal ligament, provided that these populations are given the opportunity to occupy a periodontal wound. Such opportunity arises when other cell populations, such as epithelial cells or gingival fibroblasts which also would invade the wound space are effectively exclude.

For these procedures, both nonresorbable and bioabsorbable materials including filter paper, expanded polytetrafluoroethylene (ePTFE) mesh, collagen, polyglactin, amorphous polylactic acid, oxidized cellulose have been used.

GTR procedures have been attempted for the treatment of various of periodontal defects. Successful treatment of osseous defects by GTR procedures depends on a careful diagnosis. Defects that might be candidates for GTR procedures are preliminarily diagnosed at the initial examination.

Flap design for GTR procedures is aimed at maintaining a maximum band of keratinized tissue adjacent to the treated area. Initial incisions are begun either within the gingival sulcus or slightly submarginally. Full thickness flaps are reflected beyond the mucogingival junction to give the surgery maximum visibility and flexibility for proper defect management.

Patients should be placed in a maintenance program. Between 8 to 9 months post-surgery, the site should be evaluated for decrease in probing depth and gains in clinical attachment levels.