

Patterns Of Wound Healing Following Various Periodontal Procedures – A Review

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INTRODUCTION:

The tissues investing and supporting the teeth, includes gingiva , alveolar bone, root cementum and periodontal ligament. Periodontal defects considered for reconstructive therapy may exhibit substantial loss of alveolar bone, periodontal ligament, and gingiva, whereas the root cementum is contaminated by exposure to the oral environment. In general, healing or repair with substantial tissue loss is accomplished by collagenous scar tissue that does not fully restore form and function of lost structure [1]. Periodontal repair is described in terms such as new attachment, collagen adhesion and connective tissue repair. Healing following periodontal reconstructive therapy may result in formation of a long junctional epithelium at the interface between tooth and mucogingival flap. Periodontal regeneration includes regeneration of alveolar bone, cementum, periodontal ligament, and gingiva; however, the tissue structure may not be anatomically or functionally perfect and may or may not include some evidence of scarring.

Biology Of Periodontal Wound Healing

Most forms of periodontal therapy cause injury to both epithelium and connective tissue these tissues can be restored by two processes:[2]

- 1) Regeneration
- 2) Repair

Regeneration:

Regeneration is often used in periodontitis to describe instances where the structure and functional relationships of damaged periodontal tissues appear to be renewed. The most common use of term regeneration is new attachment or formation of new cementum, alveolar bone and periodontal ligament [3].

Repair:

Repair is the process by which the damaged tissues are replaced by tissues that do not duplicate the function of original tissues. For instance, decreased probing depths after treatment of severe periodontal supra bony defects are frequently the result of connective tissue repair and the formation of a long junctional epithelium. This repair is termed as re-attachment [4].

Wound Healing Patterns Following Various Periodontal procedures[6]

Curettage

Curettage is the scraping the gingival wall of periodontal pocket to remove inflamed soft tissue. Immediately after curettage blood clot fills the gingival sulcus. Restoration and epithelization of the sulcus generally begins in 2-3 days after curettage and gets completed between 7-10 days after treatment.

Clinical changes of the tissues after curettage

Marginal gingiva appears red and blood coagulum will be present at the margins of the gingiva

1. After 2 days the gingiva appears light bluish red.
2. After 4 days the gingiva appears red edematous with reduced intensity.
3. After 6 days gingival tissue will be light red and edema is markedly reduced.
4. After 7 days gingival tissue will be pink with constriction and recession but marginal gingiva is smooth and glossy.
5. After 8 days gingiva remains smooth.
6. After 9 days gingiva appears pale pink with surface keratinization.

Gingivectomy and gingivoplasty[7]

The major events in healing are re-epithelization of the wound surface and restoration of the dentogingival junction. Healing by Primary intention is seen in gingivectomy and secondary intention in gingivoplasty.

MUCO GINGIVAL SURGERY[8]

Free gingival grafts

Immediately after placement of the graft a fibrin clot forms between graft and the underlying periosteal bed, then there is transport nutrients from the recipient area to connective tissue of the graft. Re epithelization occurs during the last half of the first post-operative week with cells originating from lateral wound margins of epithelial ridges within the graft. By 72 hours connective tissue proliferation begins and by the end of the first week a fibrous attachment between the graft and the recipient is seen. By 14th day the epithelium presents nearly normal histologic thickness.

Lateral pedicle grafts

At 4th day wound surface appears red suggesting the formation of granulation tissue.

And on the sixth day post operatively budding capillaries are seen in the granulation tissue at the wound interface. The greatest cellular activity is observed at 6th day, which is certainly responsible for the formation of the new reparative connective tissue. Continuity of the periodontal flap and vasculature is established within 9 days. Histologically by 21 days revascularisation of the flap is established.

Full thickness mucoperiosteal flap[4]

Fibrin clot is formed at the flap to bone interface. In the first 2 days the inflammation is particularly intense in the haversian canals, marrow spaces and the connective tissue of the mucoperiosteal flap. After 4 days there is evidence of proliferation of fibroblast and angioblast from periosteal surface of the flap into fibrin clot. By tenth day there will be apposition of new bone on the periosteal, marrow, and periodontal ligament surfaces of the alveolar bone. The new junctional epithelium will be completely formed by the end of second week. From 4th week till the end of third month the healing will feature less proliferative activity while connective tissue maturation and osseous re-modelling will become more dominant elements.

Partial thickness flap [4]

The flap is fused to the periosteum by a fibrin clot for the first 48 hours. Epithelial bridging of the wound is complete during the first week of healing. Fibroplasia and angioplasia are important features of repair at the end of first week. During the second week the epithelium is restored to presurgical thickness and degree of keratinization. The junctional epithelium will be re-established by the end of

the second week. The osteogenesis, which begin at day six produces osteoid in the marrow spaces of the alveolar bone. The restoration of the dentogingival junction and the crest of the alveolar bone will also be completed without deformities by the end of third week.

CONCLUSION:

Wound healing in the oral cavity is a very complex process. We are just starting to uncover the complex interplay between various cell types, growth factors and salivary components. The focus of this review was to summarize the two major events of gingival wound healing, namely re-epithelialization and the formation of granulation tissue. This review gives the overall healing patterns followed by various periodontal procedures.

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