

Enhancing esthetic and biological outcomes of implant placement



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Summary

GBR and Ridge Augmentation are significant components of creating requisite conditions and sufficient biological environments, while placing implants. It has become a routine procedure in everyday practice of implant dentists. Preservation of bone width is now becoming a mandatory procedure for implant placement, which is conducted, based on prosthetic driven approach.

We will discuss bone reconstruction with the usage of different types of barrier membranes, such as native collagen I type and cross-linked collagen membranes, non-resorbable dPTFE membranes (with or without titanium reinforcement), usage of titanium meshes, cortical plates (xeno- and autogenous) and Cortical Lamina, advantages and disadvantages of different barrier systems. Types of grafting materials, usage priorities will also be the part of our discussion.

Increasing the volume of bone is an essential facet of contemporary implant dentistry to ensure sufficient and long-lasting support to the implant and restoration. Dental implants have become a widespread treatment technique in cases of missing tooth/teeth. It is obvious that the usage of various regenerative techniques along with implant placement became an important procedure that helps and promotes the process of bone regeneration.

The basics of bone regeneration involve utilizing a mechanical barrier to secure blood clot, isolating the bony defect from the connective tissues surrounding these defects, thus providing favorable conditions for bone formation cells to access barrier isolated membrane space, intended for new bone formation.

A multitude of techniques has been developed to increase the volume of deficient alveolar ridge and implant placement performed either simultaneously with GBR or in second stage surgery after the healing period. Among those we will discuss:

- Ridge Expansion Osteotomy
- Ridge Splitting Technique
- Modified Khoury Techniques
- Cortical Lamina Technique
- GBR with dPTFE(Ti-reinforced) and Titanium Mesh
- GBR with Collagen Membrane and bone substitutes chips

Significant focus will be rendered to socket preservation after tooth extraction with or without immediate implant placement. Additionally, soft tissue modification along with CTG and temporary crown modification will be important parts of discussion.

Summarizing all of the aforementioned factors:

Indications for GBR:

1. Local alveolar ridge deficiency (horizontal and vertical)
2. Osseous voids around immediate implants.
3. Bone deficiencies associated with failed implants
4. Residual bone lesions

Principles of GBR:

1. Cell exclusion

Such as gingival fibroblasts and epithelial cells, which cause the formation of fibrous connective tissues. Barrier membranes used to prevent ingrowth of undesired cells into grafted zone.

2. Tenting

Creating space provided by membrane, completely isolating bony defects from overlying soft tissues.

3. Scaffolding

Tenting space provided by membrane acts as a space for fibrin clot formation. Clot acts as a framework for cell migration and proliferation.

4. Stabilization

The clot under the membrane has to be protected from any type of disruption due to the membrane movement. Proper membrane fixation helps to stabilize the clot.

5. Framework

In cases of fenestration and dehiscence the membrane itself cannot maintain the space without the requisite framework, preventing it from collapsing. Titanium reinforcement such as Ti- mesh or Ti framework under the barrier membrane makes it possible to maintain the space.

Conclusion

Based on the provided evidence, it is evident that GBR is a predictable procedure used in rehabilitation of alveolar ridges with horizontal and vertical deficiencies. Although GBR may be technique sensitive, if properly executed -desirable outcome will be obtained.