Guided Bone Regeneration using NeoGen Ti-Reinforced Membranes: Case Reports

By Neoss Ltd, Cases by Dr. Norbert Hassfurther, Germany

Membranes are used in Guided Bone Regeneration (GBR) to aid in the regenerative healing of bone defects. The membrane is surgically placed under the oral mucosa. It stops the soft tissue from growing into the defect and creates space for complete fill of the defect with regenerated bone.

In many cases where substantial bone regeneration is required, such as vertical bone augmentation, a titanium-reinforced non-resorbable membrane is required to achieve predictable results.

NeoGen Ti-reinforced Membrane is a new generation of non-resorbable titanium-reinforced membrane combining the handling and tissue interactions of expanded PTFE with the enhanced barrier function offered by dense PTFE. The membrane has a three-layer design. The outer, soft tissue friendly, PTFE layer has a tight texture that is impermeable to bacteria; the middle layer is a strong and highly shapeable titanium mesh that retains its shape throughout the healing period; and the inner PTFE layer has an expanded texture that enables predictable hard tissue integration. This combination results in a membrane that is easy to handle and protects the augmentation site in a predictable manner.

This article describes three cases of GBR using a Ti-reinforced PTFE membrane and simultaneously placed dental implants without the use of bone substitutes.

Case 1
Vertical ridge augmentation of severely resorbed mandible
A 52 year old male was referred to the clinic with a severely resorbed anterior mandible due to a failed bone graft after removal of a large cyst (Figure 1). Pre-treatment radiographic assessment (Figure 2) showed that the bone height was inadequate to properly house implants. It was decided to perform a vertical ridge augmentation using NeoGen™ Ti-Reinforced Membrane and simultaneously placed dental implants without the use of bone substitutes.

A full thickness flap with releasing incisions was opened and four Neoss ProActive Straight implants were placed; two anterior and two posterior. The vertical defect between the two anterior implants was 5-6 mm (Figure 3). Autogenous bone cylinders (3.4 x 4-5 mm) were harvested from the oblique line of the mandible in the molar region and placed between the two anterior implants to accelerate regeneration and to act as space fillers. A NeoGen™ Ti-Reinforced Membrane Large was trimmed, shaped, and fitted at the surgical site and secured buccally with two tacks (Figure 4). A stable membrane configuration was achieved using the implants as tent posts (Figure 5). Stress free flap closure was achieved by releasing the periosteum on the buccal side. The soft tissue healing was uneventful (Figure 6).

After 4-5 months, second stage surgery was performed. A mid-crestal incision was used to lift a flap and ex-
A 19 year old female presented with narrow ridge of the upper jaw, two congenitally missing teeth in the premolar area of the upper jaw, resulting in a very narrow atrophic ridge, with inadequate bone width to properly house implants (Figure 8). The treatment plan included regeneration of the ridge using Neogen™ Ti-Reinforced Membrane and simultaneously placing Neoss ProActive Straight Implants.

A full thickness flap was opened, osteotomies were prepared on the palatal aspect of the ridge, and two Neoss ProActive Straight implants were placed. Both implant sites had fenestrations on the buccal side (Figure 9) and palatal dehiscences (Figure 10). A Neogen™ Ti-Reinforced Membrane Medium was trimmed, shaped, and fitted at the implant site. Autogenous bone chips collected during drilling of the implant osteotomies were used to fill the palatal dehiscence (Figure 11). No material was used to fill the buccal fenestration, the strength of the mesh created the space for bone regeneration. The membrane was secured with two tacks buccally (Figure 12). Flap closure was achieved, and the soft tissue healing was uneventful (Figure 13). Radiographic assessment confirmed bone regeneration around the implants (Figure 14). After 3 months of soft tissue healing (50 months after membrane placement) the implants were temporary restored (Figure 15).

Case 3 Vertical ridge augmentation in the aesthetic zone

A 40 year old patient presented with a missing central incisor and a resorbed ridge (Figure 20). It was planned to perform a vertical ridge augmentation with Neogen™ Ti-Reinforced Membrane – Medium Interproximal and simultaneous implant placement of Neoss ProActive Straight implant.

After 7 months, second stage surgery was performed. A mid-crestal incision with releasing incisions was used to lift a flap and expose the membrane (Figure 21). The titanium mesh kept the membrane shape stable for the entire healing period. Removal of the membrane revealed that the whole volume enclosed by the membrane had been regenerated with new bone and a new vertical ridge had been created (Figure 17). Exposure of the implant osteotomies was performed (Figure 16). PEEK healing abutments were connected to the implants and the flap was closed (Figure 17). Radiographic assessment confirmed bone regeneration (Figure 16).

After 6 months, second stage surgery was performed. A mid-crestal incision with releasing incisions was used (Figure 20). The flap was lifted to expose the membrane (Figure 29). The soft tissue can easily be separated from the membrane after healing. The membrane was removed. Newly formed bone fills the entire space created by the membrane (Figure 30). Excess bone on top of the cover screw was removed (Figure 31). A PEEK healing abutment was connected to the implants and the flap was closed (Figure 32). Radiograph taken directly after abutment connection shows that bone has been successfully regenerated up to the level of the implant platform (Figure 33).

Conclusion

The cases show that vertical ridge augmentation and horizontal ridge widening with optimal bone fill can be achieved in a predictable manner when performing GBR using the Neogen Ti-Reinforced Membrane.
Considerations for Long Term Success
Implants are Never Forever!

By Dr. Shankar Iyer, USA

This article will emphasize the im-
portance of factors to consider be-
fore treatment planning for full arch
implants. It is not uncommon to make misleading pro-
mises in implant dentistry, prom-
ing implants as an option with unfounded claims of 90% success rates. Most of the survival statistics have evaluated implants for full mouth reconstruc-
tions through preuse citations of the original Branemark’s work pub-
lished in 1968. Repeated citations of this article and the subsequent fol-
low up articles have made claims of a high percentage of success with im-
plants. While this is partially true, the circumstances under which these implants survived has been incor-
rectly extrapolated to other clinical situations. The original Branemark research was done on vestibular arches with hybrid prosthesis op-
posing either complete dentures or prosthesis of similar construction.

Patients are now wondering with these highly overstated survival rates, why their implants are ail-
ing and need maintenance within a short span. The answer lies in the lack of understanding of biomech-
anics. The connotation that anything works has led to confusion in the field. The diametrically opposite views of short vs long implants, axial vs angled implants, graft vs graftless solutions, regular vs minis, delayed vs immediate, two piece vs two piec-
es, guided vs free hand placements and platform switching concepts have only caused anarchy in the dis-
cipline of implant dentistry. Po-
dium concepts have gained popular-
ity through corporate support and we see opinion leaders vociferously making unsubstantiated claims through limited clinical evidence. A novice finds it very difficult to get in-
volved in implant dentistry because the education is being blessed by companies and not through univer-
sities or institutions.

After being involved in implants for over 20 years, I find it to be a hum-
bility in facing cases with 1 treat-
ment plan that is out there before you. There is a whole world of treat-
ment plans. Lets serve our patients with what they need and not what we want them to have.

Iyer’s Top 10 Guidelines for Predict-
able Implantology
1. Diagnose the problem first and don’t treat because you have a tool that you can use.
2. Measure the disease and provide the therapy, don’t sell concepts.
3. Leave what’s new and latest to the risk takers, stick with proven and tried systems.
4. Implants are the last resort in treat-
ment planning – exhaust all conserv-
tive, conventional modalities.
5. Implants should replace missing teeth not replace teeth.

6. Expensive implants don’t mean success rates are better, cheaper does not mean everything works – you get what you pay for. There is no substi-
tute for evidence based practice
7. Consider every implant as a failing
8. If you can’t prove it, you can’t treat it.
9. Consider the implant in the mouth as a dynamic system and not a static one.
10. Remember the design, material, and surface modifications of the implant system are only as good as the quality of the bone.

The message is very simple – one crawls before they walk and you must learn to walk before you can run. The same is true for implant dentistry. The novice today has a wide choice – you can become a com-
plete arch implant specialist with 4 implants and guided surgery over a weekend or spend a year learning the basics and judiciously treatment plan cases with customized solu-
tions. Half of the participants of our Maxicourses that we run in the U.S. and overseas have practitioners who have placed hundreds of implants and got their training through corporate education. One does not be-
come a musician by buying a piano or a musical instrument, nor can you be come a pilot by buying a plane. Training in implant dentistry has be-
come a fad. Most courses are offered through companies and the com-
pANY’S sole interest is to sell their sys-
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entity and the trick is to do the best you can to maintain it as long as you can.

8. Select the system that does not change its product line every year. There are more cuts or faster ways to get success in life and implants are no different.

10. The success rates of implants are inversely proportional to the number of years you practice implants.

Case Report

This case report will provide a rationale for a sound sequential treatment plan in the management of long-term failure of dental implants.

Use of implants and their treatment planning should have long-term considerations. I used to perform subperiosteal implants and blade implants in the past. One of the reasons for not using them now is not because they failed, but because in the long term, in the event of a failure, it can have some irrevers-ible consequences. This case underscores the importance of proper care from the beginning so that when patients live into their 90s they don’t become incapacitated, not being able to chew their food properly and lose the benefits of implants they enjoyed for a long period of time.

A 78 year old Caucasian female presented to my practice for rehabilita-
tion and prosthetic replacement of failing implants. She suffered having some implants 27 years ago and it has been trou-
blesome ever since with symptoms of sinus infections and movement of the entire maxillary prosthesis (Fig 9). Radiograph revealed bone loss around the unilateral subperiosteal implants and the blade implants in the anterior sextant (Fig 11). After careful examination, it was decided that none the maxillary implants was salvagable. Treatment plan was formulated to stage the case to periodontal scaling of the inflamed soft tissue and reposition bone.

The entire maxillary frame had to be sectioned and removed piecemeal (Fig 11). An immediate denture was fabricated and the tissues were allowed to heal for a period of two months. A stereolithographic model was created to assess the con-
dition of the remaining bone (Fig 6). A decision was made to reconstruct the maxilla with bilateral sinus aug-
mentation. The anterior sextant had bone loss till the anterior nasal spine. Six months following the augmenta-
tion, nine implants were placed in the augmented bone (Fig 7). Wagon it surgery was performed after a heal-
ing period of 8 months. Impressions were taken (Fig 8). A Universal modi-
fied abutment was utilized to bring all of the platforms equi-gingival (Fig 9). A verification jig was utilized to check for passivity and accuracy of the positions of the abutments (Fig 10). The metal frame was indexed, cast and tried in (Fig 11, 12). Facebow transfer record was obtained for orien-
tation relationship. The post op radiograph reveals a stable out-
come (Fig 11). After the cantilevered crowns provide for optimal esthetics in the extremely resorbed anterior maxilla. The post operative outcome provided an esthetic and functional rehabilitation of the failing implant FPD (Fig 18). The provision of pontics enhanced the outcome in the esthetic zone and in this case it favored the design due to the atrophy that precluded implant placement in the premaxilla. The case has been in function for over 5 years and the patient has been on re-
care every 4 months.