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 Neoss ProActive Straight Implants.

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 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 expose the implants. The implants were osseointegrated and the soft tissue healed uneventfully. The membrane was removed (Figure 7). The implants were restored with abutments and crowns (Figure 8). The patient was satisfied with the esthetic and functional outcomes (Figure 9).
pose the membrane. The membrane was removed, excess bone removed and PEEK healing abutments were connected to the implants. As seen in figure 7, the implants were totally enclosed in newly formed bone, and the ridge had been regenerated to the desired height.

Case 2
Regeneration of an extremely narrow ridge
A 19 year old female presented with 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 Neocen™ 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 Neocen™ 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 esthetic 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 Neocen™ Ti-Reinforced Membrane – Medium Interproximal and simultaneous implant placement of Neoss ProActive Straight implant.

A full thickness flap with releasing incisions was opened, revealing a large vertical defect (Figure 21). A Neoss ProActive Straight implant was placed an 8 mm vertical defect (Figure 22). Autogenous bone cylinders (3.4 x 4.5 mm) were harvested from the oblique line of the mandible in the molar region and placed around the implant to accelerate regeneration and to act as space fillers (Figure 23). A Neocen™ Ti-Reinforced Membrane Interproximal was trimmed, shaped, and fitted at the surgical site and secured buccally with two tacks (Figure 24). Stress free flap closure was achieved by releasing the periosteum on the buccal side (Figure 25). The soft tissue healing was uneventful (Figure 26–27).

After 6 months, second stage surgery was performed. A mid-crestal incision with releasing incisions was used (Figure 28). 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 to get access to the implant (Figure 31). A Neocen™ Ti-Reinforced Membrane – Medium Interproximal was trimmed, shaped, and fitted at the surgical site and secured buccally with two tacks (Figure 32). Stress free flap closure was achieved by releasing the periosteum on the buccal side (Figure 33). 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 wide ridge had been created (Figure 34). Exposure of the implants and the flap was closed (Figure 35). Radiograph taken directly after abutment connection shows that bone has been successfully regenerated up to the level of the implant platform (Figure 36).

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 Neocen Ti-Reinforced Membrane.
By Dr. Shankar Iyer, USA

This article will emphasize the importance of factors to consider before treatment planning for full arches with implants. It is not uncommon to make misleading promises about the use of implants as an option with unfounded claims of 98% success rates. Most of the survival statistics have evaluated implants for full mouth reconstructions through pre-use citations of the original Branemark work published in 1981. Repeated citations of this article and the subsequent follow-up articles have made claims of a high percentage of success with implants. While this is partially true, the circumstances under which these implants survived has been incorrectly extrapolated to other clinical situations. The original Branemark research was done on mandibles with hybrid prosthesis opposing either complete dentures or prosthesis of similar construction.

Patients are now wondering with these highly overstated survival rates, why their implants are failing and need maintenance within a short span. The answer lies in the lack of understanding of biomechanics. 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 grafted solutions, regular vs minis, delayed vs immediate and long-term vs two pieces, guided vs free hand placements and platform switching concepts have only caused anarchy in the discipline of implant dentistry. Pseudoscientific concepts have gained popularity through corporate support and we see opinion leaders vociferously making unsubstantiated claims through limited clinical evidence. A novice finds it very difficult to get involved in implant dentistry because the education is being blessed by companies and not through universities or institutions.

After being involved in implants for over 20 years, I find it to be an humbling experience with cases that I treat planned two decades ago returning to me for maintenance. Seeing these cases today, I wish I had this experience at that time so I could have served my patients better. Today it has taught me a lot in evidence based practice. The learning in implant dentistry is not the same for every system and changing the design requires extensive research. Classical examples of potential catastrophic failures include the TPF coating, HA surface modifications, sintered surfaces, flapless surgeries, guided surgeries, immediate loading, costly BVPs and the list goes on.

The message is very simple – one must crawl before you walk and you must learn to walk before you can run. There is a learning curve that will be used to evaluate its efficacy. The novice today has a wide choice – you can become a complete arch specialist with 4 implant and guided surgery over a weekend or spend a year learning the basics and judiciously treatment plan cases with customized solutions. 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 become a musician by buying a piano or a musical instrument, nor can you become a pilot by buying a plane. Training in implant dentistry has become a fad. Most courses are offered through companies and the company’s sole interest is to sell their systems. There is a whole world of treatments that is out there before the system can be utilized. Let’s not place the cart before the horse. The void is very apparent the time is now for implementing judicious treatment plans. Let’s serve our patients with what they need and not what we want them to have.

Iyer’s Top 10 Guidelines for Predictable 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 treatment planning – exhaust all conservatively.
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.
7. There is no substitute for evidence based practice.
8. Consider every implant as a failing implant.

Pre-op Patient Presentation
Fig 1

Radiographs of the Failing Maxillary Implant Reconstruction
Fig 2

Removal of Implant FPD
Fig 3

Radiographs of the Failing Mandibular Implant Reconstruction
Fig 4

4 week post op - after tissue conditioning
Fig 5

Stare/orthographic Models after Scan
Fig 6

Blaseal Sinus Lift and Implant Placement
Fig 7

Stage II Impression for Abutment selection
Fig 8

Universal Modified abutments for tissue level connection
Fig 9

Verification Jigs
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 three 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. A meticulous 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 fail, but because in the long term, in the event of a failure, it can have some irreversibly damaging consequences. This case underscores the importance of over engineering cases 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 that they enjoyed for a long period of time.

A 78 year old Caucasian female presented to my practice for rehabilitation of a failing implant FPD. She reported having some implants 27 years ago and it has been troubled ever since due to symptoms of sinus infections and movement of the entire maxillary prosthesis (Fig 9). Radiography revealed bone loss around the unilateral subperiosteal implants and the blade implants in the anterior sextant (Fig 3). After careful examination, it was decided that none the maxillary implants was salvagable. Treatment plan was formulated to stage the case to prevent grafting of the inflamed soft tissue and reinsert bone. The entire maxillary frame had to be sectioned and removed piecemeal (Fig 1). An immediate denture was fabricated and the tissues were allowed to heal for a period of two months (Fig 5). A stereolithographic model was created to assess the condition of the remaining bone (Fig 6). A decision was made to reconstruct the maxilla with bilateral sinus augmentation. The anterior sextant had bone loss till the anterior nasal spine. Six months following the augmentation, nine implants were placed in the augmented bone (Fig 7). A reinsert surgery was performed after a healing period of 8 months. Impressions were taken (Fig 9). A Universal modiﬁed abutment was utilized to bring all of the platforms equigingival (Fig 9). A ventilation 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). Face bow transfer record was obtained for orientation relationship. (Fig 13) Porcelain overlay for an FPD prosthesis was processed and inserted (Fig 14, 15) A mutually protected occlusal scheme was designed (Fig 16). The patient's vertical was maintained. The post op radiograph reveals a stable outcome (Fig 17) The anterior cantilevered crowns provide for optimal esthetics in the extremely resorbed 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.

The entire maxillary frame had to be sectioned and removed piecemeal (Fig 1). An immediate denture was fabricated and the tissues were allowed to heal for a period of two months (Fig 5). A stereolithographic model was created to assess the condition of the remaining bone (Fig 6). A decision was made to reconstruct the maxilla with bilateral sinus augmentation. The anterior sextant had bone loss till the anterior nasal spine. Six months following the augmentation, nine implants were placed in the augmented bone (Fig 7). A reinsert surgery was performed after a healing period of 8 months. Impressions were taken (Fig 9). A Universal modiﬁed abutment was utilized to bring all of the platforms equigingival (Fig 9). A ventilation 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). Face bow transfer record was obtained for orientation relationship. (Fig 13) Porcelain overlay for an FPD prosthesis was processed and inserted (Fig 14, 15) A mutually protected occlusal scheme was designed (Fig 16). The patient's vertical was maintained. The post op radiograph reveals a stable outcome (Fig 17) The anterior cantilevered crowns provide for optimal esthetics in the extremely resorbed 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.

The Tenth Annual American Academy of Implant Dentistry MaxiCourse®- UAE 2017 - 2018 Starts 28 July 2017

A unique opportunity towards becoming a Diplomat of the American Board of Oral Implantology/Implant Dentistry- AAID is the sponsoring organization of ABOI

In Fulfillment of the Educational Requirement for the Examination for Associate Fellow Membership and Fellowship for the American Academy of Implant Dentistry

The Faculty are as follows:

Dr. Shankar Iyer, USA
Director, AAID Maxi Course®- UAE
Diplomate ABOI
Associate Professor Rutgers School of Dental Medicine

Dr. Ninette Banday, UAE
Co-Coordinator AAID-MaxiCourse®- UAE
Akta Shaied, Consultant Academic Associate Fellow UAE

Dr. Avnet Yare, USA
Diplomat of the American Board of Periodontology
Professor of Surgery, JHU Hospital and the Veteran Affairs Hospital

Dr. Jaime L posea, USA
Diplomate of the American Board of Implant Dentistry
FAI, American Academy of Implant Dentistry

Dr. William Locante, USA
Diplomate of ABD
FAI of America Academy of Implant Dentistry

Dr. Robert Horowitz, USA
Diplomate American Board of Prosthodontics
Clinical Assistant Professor New York University

Dr. Frank Lalor, Sn USA
Fellow, American Academy of Implant Dentistry
Diplomate, American Board of Oral Implantology

Dr. Frank Lalor Jr, USA
Diplomate American Board of Prosthodontics

Dr. John Minichetti, USA
Diplomate American Board of Oral Implantology
Diplomate, American Academy of Implant Dentistry

Dr. Kim Gowery, USA
Fellow/Faculty AAID

Dr. Burnee Dunson, USA
Diplomate American Board of Oral Implantology

Dr. Jason Kim, USA
Diplomate of ABD

Dr. Orazio Banday, USA
Professor of Dentistry, Faculty of Dentistry, Beirut Arab University

Dr. Philip Tardieu, France
Fellow and Author, Computer Guided Implantology and the UAU Centre

Dr. Natalie Wong, Canada
Diplomate, American Board of Oral Implantology
Fellow, American Academy of Implant Dentistry

Dr. Osaka Banday, USA
Professor of Dentistry, Faculty of Dentistry, Beirut Arab University

MaxiCourse®- Advantage:

- 300 hours of comprehensive lectures, live surgeries, demonstration and hands on sessions.
- In depth review of surgical and prosthetic protocols.
- Sessions stretch across 5 modules of 6 days. Each session is always inclusive of a weekend.
- Curriculum taught by over 18 faculty & speakers from the most distinguished names in implantology.
- Certificate of completion awarded by the American Academy of Implant Dentistry.
- Non commercial, non sponsored course covering a wide spectrum of implant types and system.
- Hands-on patient treatment under direct AAID faculty supervision.

Membership for AAID awarded for 2017 – 2018

MaxiCourse®- Dates:

Module 1     July 28th – August 2nd 2017
Module 2     Nov 1st – 6th 2017
Module 3     Jan 25th – 30th 2018
Module 4     March 30th – April 4th 2018
Module 5     July 3rd – 7th 2018

Registration:

Pre-Registration is Mandatory as it is a limited Participation Program.

For further information and registration details visit website: www.maxicourse2016.com or e-mail Dr. Ninette Banday, Coordinator AAID-MaxiCourse®-UAE at drnbanday@yahoo.com