

Guided Bone and Tissue Regeneration Simplified with GUIDOR[®] Matrix Barrier

Introduction: Guided bone regeneration (GBR) and guided tissue regeneration (GTR) are dental surgical procedures that utilize barrier membranes and aid in the growth of new bone and/or soft tissue. GBR and GTR are performed at sites with insufficient dimensions of bone or gingiva for proper function, esthetics or restoration. The regeneration of osseous defects and bone augmentation are predictably attainable with the proper use of dental membranes, which mechanically exclude non-osteogenic cells from adjacent soft tissue, allowing the wound to be colonized by osteogenic cells from the adjacent periodontium.

The concept of regeneration utilizes barrier membranes that are either bioresorbable or non-resorbable and made of synthetic or natural materials. Nonresorbable membranes remain in place, completely covered by the soft tissues, for a period of time sufficient to allow bone regeneration and maturation, and then they must be removed with reentry surgery. Resorbable membranes require tissue integration in addition to biocompatibility, cellular occlusion, space preservation, and easy clinical handling. Resorbable membranes are either synthetic or animal derived, and are gradually hydrolyzed or enzymatically degraded; therefore do not require a reentry surgery. Synthetic membranes lack the risk of immunogenic reactions or transmission of animal-derived pathogens intrinsic to animal-derived materials.

Description:

GUIDOR[®] Bioresorbable Matrix Barrier is a dental membrane for bone regeneration, augmentation and tissue regeneration, manufactured by *Sunstar Americas, Inc.*

The **GUIDOR Matrix Barrier** is composed of a bioresorbable polylactic acid blended with a citric acid ester. The **GUIDOR Matrix Barrier** has two perforated layers, separated by spacers. The external layer has rectangular perforations that allow ingrowth of gingival connective tissue into the space between the two layers. When connective tissue cells migrate through the external layer of the matrix, they spread out and occupy the space between the two layers. Smaller perforations on the internal layer prevent complete penetration by gingival connective tissue, effectively inhibiting epithelial down growth.

GUIDOR Matrix Barrier is moldable and can be cut and shaped to precisely cover the defect site. The design, control, handling, and predictability make **GUIDOR Matrix Barrier** unique.

Clinical Case 1: Socket Preservation with Subsequent Implantation

A 32-year old male presented with a fractured mesial root #19 (Figures 1a and 1b).

The patient had been experiencing pain for the past week and requested an appointment. Clinically, tooth #19 had a draining buccal fistula and an eight mm localized probing depth on the mesial root. The tooth was deemed hopeless and treatment planned for extraction.

The patient was given the option after extraction of: do nothing, a removable partial, a fixed bridge, or a dental implant. The patient opted to proceed with extraction, socket preservation, and dental implant placement.



Figure 1a. Initial photo of #19 with draining buccal fistula



Figure 1b. Initial radiograph of #19

Clinical Procedure: Socket Preservation

An intersulcular incision was used on the buccal and lingual, with facial vertical releasing incisions. The buccal flap was elevated; the tooth was sectioned to preserve bone (Figure 2). After extraction there was a four mm dehiscence with a cortical plate less than 0.5mm thick. Allograft bone graft was packed (Figures 3a and b) and the **GUIDOR Matrix Barrier** was trimmed and placed (Figure 4). The buccal flap was released and sutured to the palate with 4.0 VICRYL® and the verticals were sutured with 6.0 chromic (Figure 5). The patient was given prescriptions for *Amoxicillin*, *Ibuprofen*, *Chlorhexidine Oral Rinse* and *VICODIN*®.

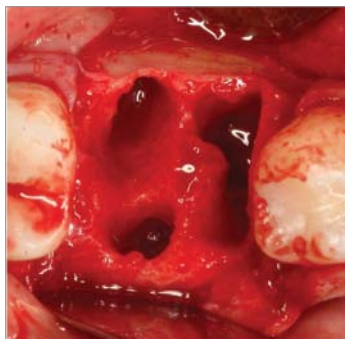


Figure 2. After Extraction

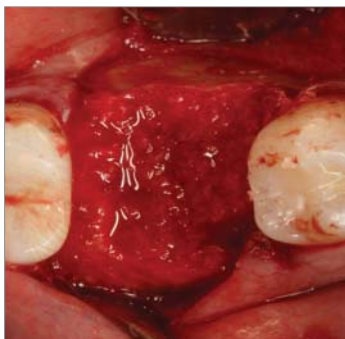


Figure 3a. Bone graft in place



Figure 3b. Radiograph of bone graft in place

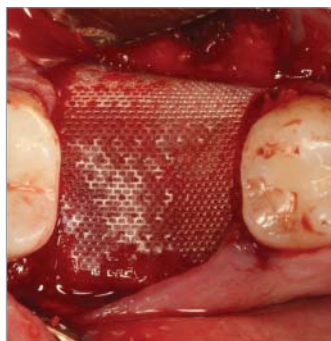


Figure 4. **GUIDOR Matrix Barrier** in place

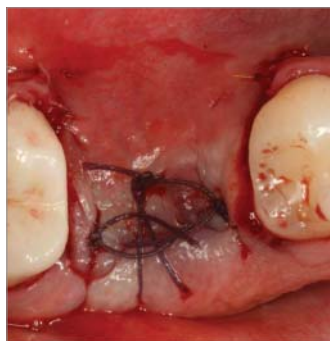


Figure 5. Sutures in place

Follow-up:

At suture removal, the patient reported very little discomfort and swelling following the surgical procedure. The sutures were removed at 10 days with very little inflammation present (Figure 6). The patient returned at one month to evaluate healing and bone fill (Figures 7a and 7b).



Figure 6. After sutures were removed at 10 days



Figure 7a. One month of healing



Figure 7b. Radiograph of one month of healing

Clinical Procedure: Implant Surgery

At three months the patient returned for dental implant placement (Figure 8). A crestal incision was made and buccal and lingual flaps were elevated to evaluate the bone (Figure 9). An initial osteotomy was created and a radiograph taken to assure proper location and angulation (Figure 10). The osteotomy size was subsequently increased to place the implant and the tissue was sutured with 4.0 VICRYL (Figures 11a and 11b). The patient was given prescriptions for *Amoxicillin*, *Ibuprofen*, *Chlorhexidine Oral Rinse*, and *VICODIN*.



Figure 8. Three months healing



Figure 9. Solid healthy bone at three months

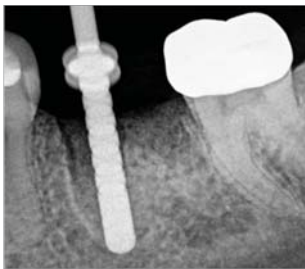


Figure 10. Radiograph after pilot drill



Figure 11a. After implant surgery



Figure 11b. Radiograph after implant placement

Follow-up:

At suture removal the patient reported even less discomfort than after the initial bone grafting surgery. At 10 days the sutures were removed and the patient was instructed to return in two months for abutment placement and impressions for final implant crown (Figure 12). After 2 months, the patient returned for abutment placement (Figure 13) and cementation of the final restoration two weeks later; for a total healing time of three months (Figure 13a and 13b).



Figure 12. Suture removal



Figure 13. Stock abutment placement



Figure 13a. Final restoration photo at 3 months



Figure 13b. Final restoration radiograph at 3 months

Conclusion:

Bone grafting is a procedure that requires a specific skill, along with the correct materials to get the desired results. The **GUIDOR Matrix Barrier** was very easy to handle, easy to cut, and adapted to the autogenous and grafted bone extremely well, while remaining stable during suturing. The tissue responded well to the graft and appeared to add some mechanical stability to the flap. At three months there were no signs of the membrane and the bone graft material was indistinguishable from the surrounding autogenous bone. The successful socket preservation provided for a very simple and predictable implant surgery.

Clinical Case 2: Socket Preservation with Membrane Exposure

A 60-year old female presented with deep furcations, severe mobility, and 10 mm probing depth on tooth #3 (Figures 1a and 1b). The patient had been experiencing mild discomfort, which had been getting progressively worse. Further, the mobility had been bothering the patient and she wanted to address it at this time. The tooth was hopeless and needed to be extracted. Extraction was recommended and the patient was given the option to do nothing, have a removable partial, or a dental implant. The patient opted to proceed with extraction, socket preservation, and dental implant placement.



Figure 1a. Initial photo



Figure 1b. Initial radiograph

Clinical Procedure: Socket Preservation

An intersulcular incision was used on the buccal and lingual of #3, with facial vertical releasing incisions. The buccal flap was elevated, the tooth was sectioned into separate roots, and removed to preserve bone (Figures 2a and 2b). After extraction there was a six mm dehiscence with a cortical plate less than 0.5mm thick. Allograft bone graft was packed and the **GUIDOR Matrix Barrier** was trimmed and placed (Figures 3a, 3b and 3c). The buccal flap was released and sutured to the palate with 4.0 VICRYL and the verticals were sutured with 6.0 chromic (Figure 4). The patient was given prescriptions for *Amoxicillin*, *Ibuprofen*, *Chlorhexidine Oral Rinse*, and *VICODIN*.



Figure 2a. Sectioned tooth

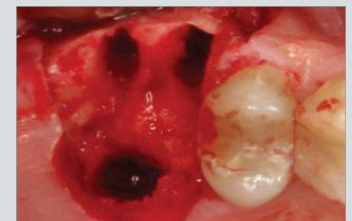


Figure 2b. Extraction socket #3



Figure 3a. Bone graft placed



Figure 3b. Radiograph after bone graft



Figure 3c. **GUIDOR** membrane placed



Figure 4. Suturing

Follow-up:

At 10 days, the patient returned for suture removal. The patient reported very little discomfort following the surgical procedure. The patient stated that due to their being no pain, she did not take the Ibuprofen and was not very careful when eating. Upon clinical examination the sutures had torn through the tissue and exposed the **GUIDOR Matrix Barrier**. The sutures were removed and the exposed portion of the membrane trimmed (Figure 5). The patient returned at one month to evaluate healing and bone fill (Figures 6a and 6b). At three months the patient returned for implant placement (Figure 7a and 7b). Upon flap elevation it was noted that the bone was extremely dense and had healed ideally (Figure 8). The implant was placed and the patient was informed to return in 10 days for suture removal (Figure 9).



Figure 5. After suture removal



Figure 6a. One month healing



Figure 6b. Radiograph after one month healing



Figure 7a. Radiograph after three months of bone healing



Figure 7b. Three months of soft tissue healing



Figure 8. Three months of bone healing



Figure 9. Day of Implant placement

Conclusion:

Again, the **GUIDOR Matrix Barrier** was easy to handle, easy to cut, and adapted to the autogenous and grafted bone extremely well. Although sutures had torn though and the **GUIDOR Matrix Barrier** became exposed, it performed as expected and the site showed no signs of infection. The successful socket preservation provided for a very simple and predictable implant surgery.

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