

Reconstruction of the alveolar buccal bone plate in compromised Fresh Socket using the anodized titanium foil technique

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Background and Aim

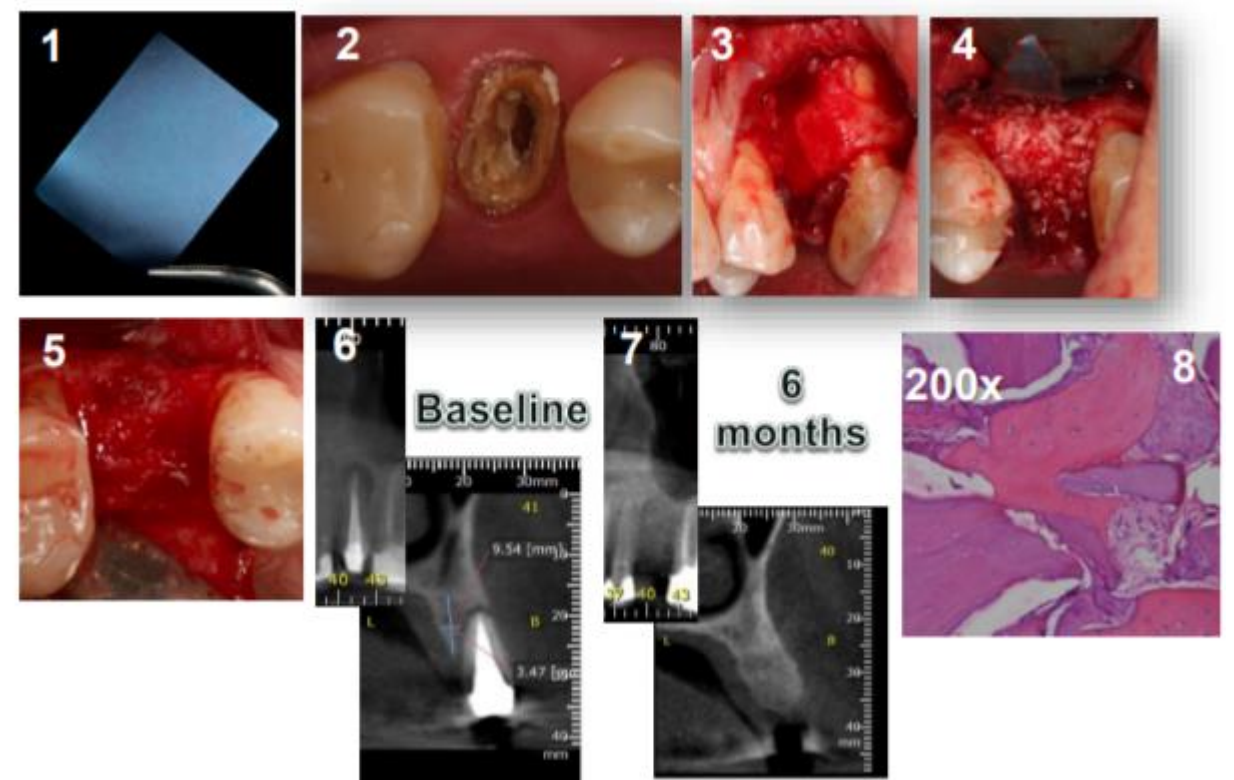
The socket preservation techniques are used to minimize bone loss and maintain gingival tissues volume after tooth extraction. However, the volume preservation rate of the alveolar process is not predictable, and most of the guided bone regeneration techniques change the mucogingival line by coronally positioning the flap to cover a membrane, what may impair implant aesthetics and function. The aim of this clinical prospective study was to evaluate the use of an anodized titanium membrane (ATM) to reconstruction of the alveolar buccal bone plate in compromised Fresh Socket, analyzing tomographical bone measurements pre-surgically and 6 months after surgery.

Methods and Materials

Fifteen healthy patients having one hopeless tooth were selected to receive the ATM for socket preservation technique. The teeth were carefully extracted, then a small flap was raised to allow the ATM insertion. The alveolus was filled with anorganic bovine bone graft (Bonefill Porous – Bionnovation – Brazil) and the ATM (Titanium Seal – Bionnovation – Brazil) was trimmed and adapted over the crestal bone and below the gingival margin. Nylon sutures were used to hold the ATM in position. Fifteen days after surgery the ATMs were removed with pliers. The measurements of the alveolus thickness were recorded in the baseline and 6 months after the surgeries, using cone beam tomographies, evaluating the distance between buccal and palatal bone plates, and were performed in the center of the alveolus, 1mm above the palatal crestal bone.

Results

The results are presented in percentage, to minimize the influence of the different alveolus sizes. After 6 months, the average of volume maintenance, 1mm above the bone crest was $104.67\% \pm 11.71$ showing with some volume gain ($p=0.255$), 3mm above the bone crest was $111.73\% \pm 8.93$ ($p=0.0075$) and 5mm above the bone crest the outcome was $106.17\% \pm 5.61$ ($p=0.0214$).



Conclusion

The use of ATM in this prospective case series presented good tomographic results for tissue volume maintenance after 6 months in cases of buccal bone plate loss, when compared to the scientific literature addressing GBR procedures using collagen membranes and connective tissue grafts. Future randomized controlled clinical studies are suggested to investigate the regenerative potential of this alveolar preservation technique.

Figure legends

1 Anodized titanium foil; 2 Clinical Baseline; 3 Before the biomaterial use; 4 Biomaterial inserted; 5 After 6 months; 6 Initial Tomography; 7 Tomography after 6 months; 8 Histology after 6 months, can be seen biomaterial and new bone



15594 POSTER DISPLAY CLINICAL INNOVATIONS

Reconstruction of the alveolar buccal bone plate in compromised Fresh Socket using the anodized titanium foil technique

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Background: The socket preservation techniques are used to minimize bone loss and maintain gingival tissues volume after tooth extraction. However, the volume preservation rate of the alveolar process is not predictable, and most of the guided bone regeneration techniques change the mucogingival line by coronally positioning the flap to cover a membrane, what may impair implant aesthetics and function.

Aim/Hypothesis: The aim of this clinical prospective study was to evaluate the use of an anodized titanium membrane (ATM) to reconstruction of the alveolar buccal bone plate in compromised Fresh Socket, analyzing topographical bone measurements pre-surgically and 6 months after surgery.

Material and Methods: Fifteen healthy patients having one hopeless tooth were selected to receive the ATM for socket preservation technique. The teeth were carefully extracted, then a small flap was raised to allow the ATM insertion. The alveolus was filled with anorganic bovine bone graft and the ATM was trimmed and adapted over the crestal bone and below the gingival margin. Nylon sutures were used to hold the ATM in position. Proper post-operative medications were prescribed (Amoxicillin 500 mg, Ibuprofen 200 mg and PerioGard rinse). Fifteen days after surgery the ATMs were removed with pliers. The measurements of the alveolus thickness were recorded in the baseline and 6 months after the surgeries, using cone beam tomographies, evaluating the distance between buccal and palatal bone plates, and were performed in the center of the alveolus, 1 mm above the palatal crestal bone. The data were statistically analyzed by Student's t-test ($P < 0.05$ was considered).

Results: The results are presented in percentage, to minimize the influence of the different alveolus sizes. After 6 months, the average of volume maintenance, 1 mm above the bone crest was $104.67\% \pm 11.71$ showing with some volume gain ($P = 0.255$), 3 mm above the bone crest was $111.73\% \pm 8.93$ ($P = 0.0075$) and 5 mm above the bone crest the outcome was $106.17\% \pm 5.61$ ($P = 0.0214$).

Conclusion and Clinical Implications: The use of ATM in this prospective case series presented good tomographic results for tissue volume maintenance after 6 months in cases of buccal bone plate loss, when compared to the scientific literature addressing GBR procedures using collagen membranes and connective tissue grafts. Future randomized controlled clinical studies are suggested to investigate the regenerative potential of this alveolar preservation technique.