

Case Study: Bone Regeneration With NovaBone Dental Putty in a Two Stage Implant Procedure: Histological & Radiological Evaluation

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History:

The patient is a 40-year old African-American female with a long history of pain and mobility in tooth #3. After evaluation, extraction and placement of an implant presented the best prognosis as tooth #3 had associated gingival recession and mobility with a failed silver-amalgam restoration.

Surgical Procedure: Extraction & Graft Placement

The tooth was extracted atraumatically under local anesthesia. It was determined that the quality of native bone was insufficient for an immediate placement of an implant as seen in figure 1. The lack of buccal plate of bone can also be clearly seen. NovaBone Dental putty was the material of choice to regenerate the bone in the socket. The putty did not require any mixing and was used directly from the package into the defect. No membrane was required since there was enough mucosal tissue to obtain primary closure. The patient was recalled after a week for post operative check-up and suture removal.

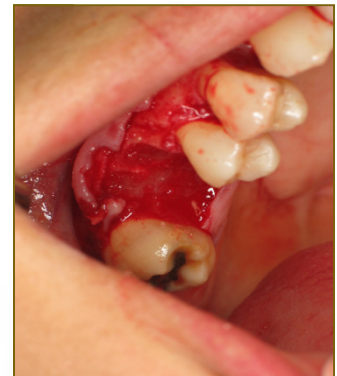


Figure 1: Post extraction image of #3

Histology Core & Implant Placement:

Five months after extraction and bone graft placement, the patient was recalled to evaluate bone regeneration and for implant placement. Radiographic evidence as seen in figure 2 indicated that the bone had completely regenerated and a surgical re-entry was essential to evaluate the ridge. The quality of regenerated bone was also excellent as demonstrated in Figure 3 - healthy natural bleeding bone with a completely regenerated buccal plate.



Figure 2: Radiographic evaluation prior to re-entry



Figure 3: Re-entry demonstrating bleeding bone

Prior to implant placement, a 2.7mm ID trephine bur was used to obtain the sample core from the regenerated socket. All efforts were made to obtain the core from the center of the regenerated area. The trephine bur with the histology core was then transferred into a container with formaldehyde and sent to University of Connecticut Pathology Department for histological analysis using a H&E stain (decalcified). A Thommen 4 mm x 11 mm implant was placed into the ridge and the mucosa sutured (fig 4).

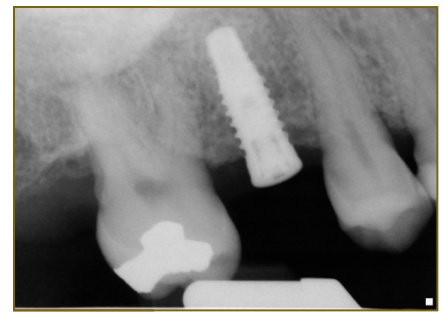


Figure 4: Post-implant placement radiograph

Histological Analysis:

Histology report received from Univ. of Connecticut reveals that the decalcified section contained several fragments of dense vital bone along with thin fragments of osseous tissue and fresh hemorrhagic debris (blood cells). This is indicative of healthy bone tissue as seen in Figure 5. No evidence of putty particles were observed in the histology sections.

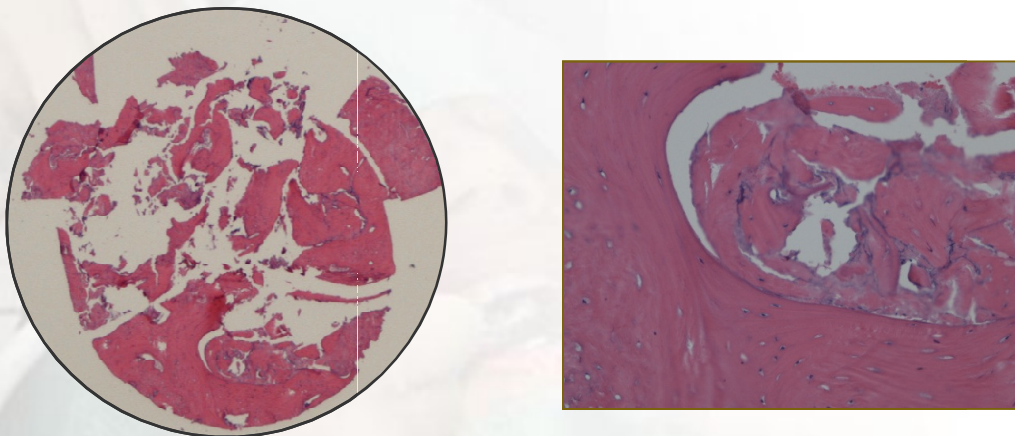


Figure 5: Histology core and section demonstrating excellent bone with no evidence of NovaBone Putty

Discussion:

Clinical, radiographic and histological analysis reveals excellent bone regeneration after use of NovaBone Dental Putty. Regeneration of the buccal plate along with an increased ridge width can be seen visually and corroborated histologically. Also, absence of putty particles in the histology sections indicates that putty is completely resorbable and yet regenerates bone simultaneously by a unique phenomenon called '**Osteostimulation**'.

NovaBone putty is the **only** synthetic bone graft putty and is extremely easy to use. It does not require any mixing or special handling procedures prior to placement. The material is cohesive providing adequate graft retention in the defect even during irrigation and suction. It is 'fool proof' and has been proven to successfully regenerate bone in varied indications including orthopedic and craniofacial surgeries.