

Bone Regeneration with Bond Apatite in Complete Absence of Vestibular Bone Table, a Case Report

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Abstract

Calcium Sulfate has been used since 1892 (Dreesman) as a graft material to regenerate bone in cases of tuberculosis, it being the most studied material for its osteoconduction and biocompatibility.

The difficulty of Calcium Sulfate's clinical manipulation and its setting time in the maxillofacial area led Dr. Amos Yahav to create a single product made of two matrices: one formed by a mixture of calcium sulfate hemihydrate and calcium sulfate dihydrate, and the other formed by hydroxyapatite. The Calcium Sulfate matrices is activated with sodium chloride meanwhile the hydroxyapatite does not undergo any changes.

The product is called Bond Apatite® and comes in syringe to facilitate the mixing of the powder with the liquid and its clinical use on bone defects.

The advantage it has on other materials is its easy handling, primary graft stability and high porosity, favoring angiogenesis and intragranular reabsorption, leaving less than 10% graft material in the new formed bone, exclusively hydroxyapatite, the Calcium Sulfate having completely disappeared.

Keywords: Calcium Sulfate; Graft; Extraction

Introduction

Guided bone regeneration (GBR) with Bond Apatite is a surgical technique used to increase limited alveolar bone for implant placement.

Calcium sulfate, a synthetic material, has been used for decades in orthopedics, plastic surgery and oncologic and maxillofacial surgeries for the treatment of osseous deficiencies caused by trauma or inflammation.

Bond Apatite: 66% Biphasic calcium sulfate combined with 33% synthetic hydroxyapatite granules (different size particle distribution) is a bone graft type that will resorb over 3 - 6 months, and new vital bone is formed in the process. The graft is completely transformed into the native bone of the patient. No graft is left behind; only the patient's bone with 90% regeneration [1-19].

Aim of the Study

This case report aims to publicize the benefits of the AUGMA Bond Apatite, especially in bone regeneration, fast procedure, fast healing, easy to manipulate and reasonable costs.

Clinical Case Report

50 year old female patient in good general health condition.

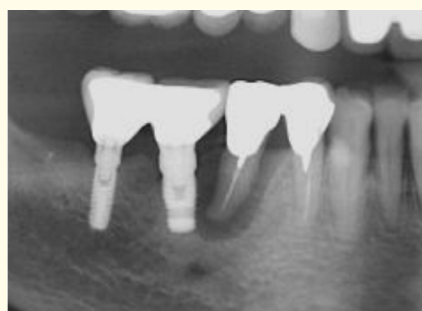


Figure 1: Periapical X-rays.

The evaluation of the panoramic radiograph showed a mandibular residual cyst in area 45 and progressive atrophy of the corresponding alveolar process. The patient was told that it would not be possible to insert implants into this edentulous ridge without significant augmentation of the alveolar ridge. It was decided, in accordance with the patient, that the lesion would be extracted and the augmentation would be regenerated with Bond Apatite.



Figure 2: Periodontal abscess.

The patient carries ceramic metal crowns on the pieces 44 - 45, reveals periapical pain and injury that made it impossible to chew in that area.

Case planning

Removal of pieces 45 and 45, curettage of the area and bone regeneration with Bond Apatite.

Implant placement on 44 - 45 once the bone has regenerated.

Surgical procedure

Infiltrative anesthetic with adrenaline.

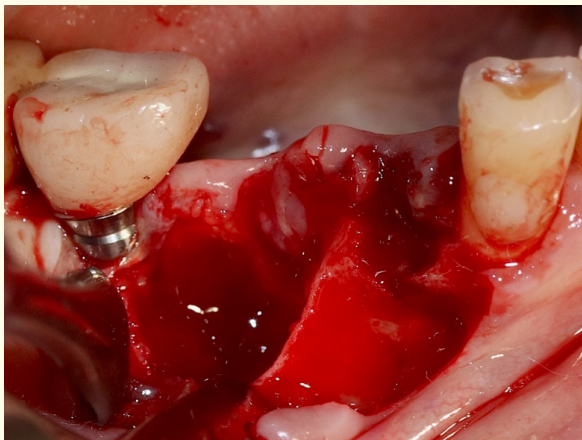


Figure 3: Absence bone table.

Removal of pieces 44 - 45, mucoperiosteal detachment, curettage of the area, noticeable complete absence of vestibular bone table on the 45 and mesial bone loss on the implant 46.

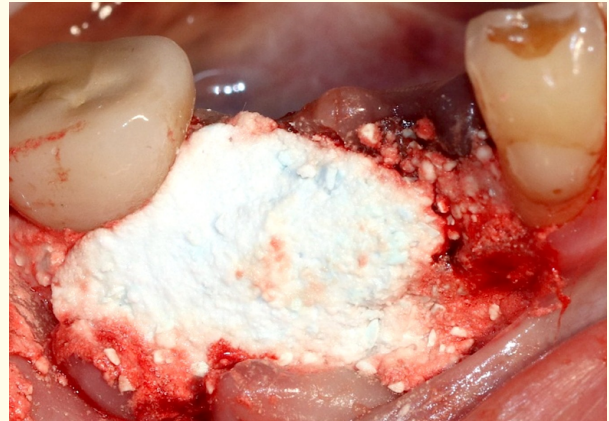


Figure 4: Bond apatite.

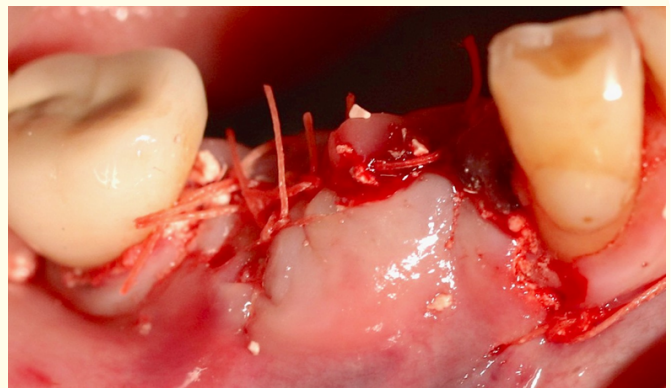


Figure 5: Reabsorbable sutures

Bone defect filling with Bond Apatite syringe, compression with dry gauze and wound closure with absorbable suture.

Bond Apatite has a barrier effect so membrane use is not required, and it can be used in infected areas as it is bacteriostatic.

Three months later

A 3D CBCT is performed and shows vestibular table bone regeneration.

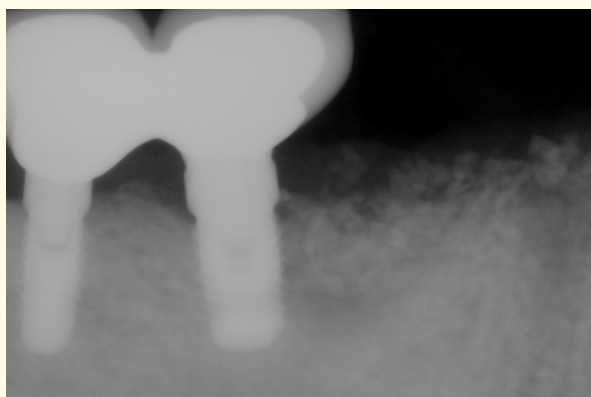


Figure 6: Periapical X-rays 3 months later.

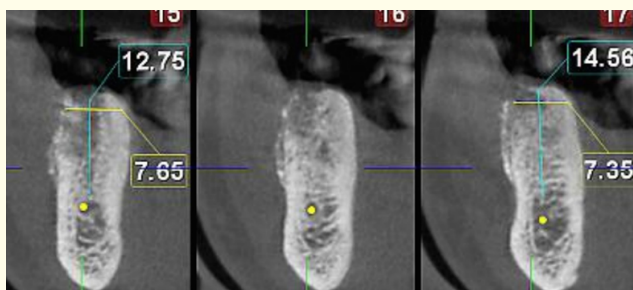


Figure 7: 3D CBCT new vestibular bone table.

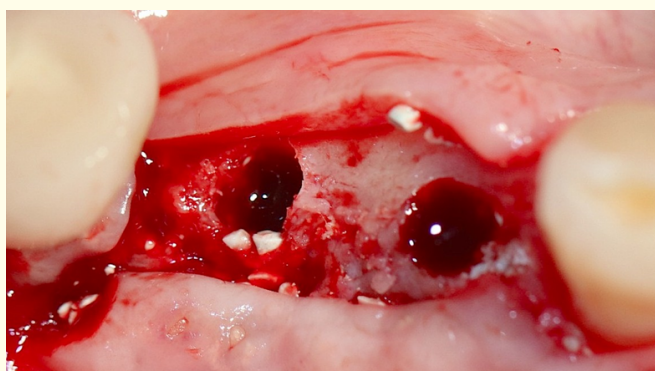


Figure 8: Normal density when drilled for the placement of dental implants 44,45. New bone around implant 46.

Infiltrative anesthetic with adrenaline.

Mucoperiosteal detachment. New bone is formed around the implant 46. Implant insertion on 44 and 45 with a torque of 35



Figure 9: Implants placement.

Ncm, the neoformed bone is the patient's own bone without bone grafting, there is only some bigger HA particle left that represents less than 10%. The rest of the Biphasic Calcium Sulfate material has been completely absorbed and transformed in vital bone.

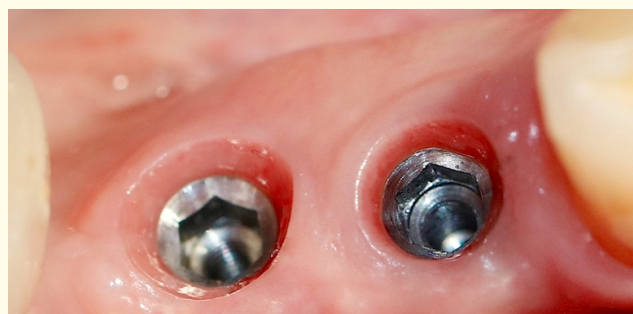


Figure 10: Keratinized tissue.

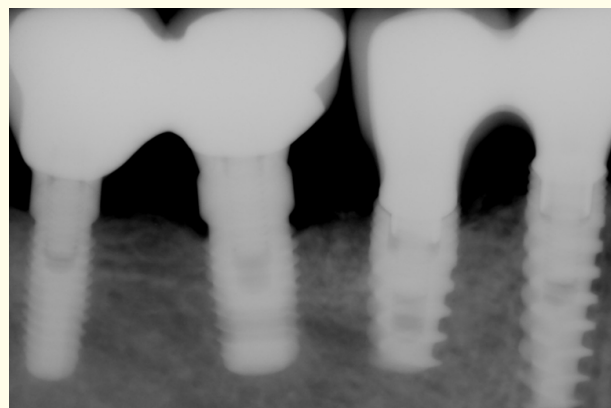


Figure 11: Final Periapical X- rays 2 years later.

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