Ridge Augmentation of a Seibert 3 Deficiency Using Sonic Welding and Simultaneous placement of Alpha-Bio Tec's NeO Implant

Prof. Ofer Moses
DMD, Specialist in Periodontology, Israel

Dr. Eyal Bijaoui
DMD, Israel

Prof. of Periodontology and member of the Periodontology and dental Implantology department, school of Dental Medicine at the university of Tel Aviv. Practice in private clinic limited to periodontology and dental implantology. EAO, 2013 winner of the European prize of Basic Science competition in implant dentistry the competition wa held in Dublin, Ireland. Serves as the Biomaterials consultant of Alpha-Bio Tec.

Dr. Eyal Bijaoui completed his dental training at the University of Tel-Aviv in 2007. After spending a number of years in general practice, in 2011 he enrolled a 4-years full time degree in Periodontology and dental implantology at the Unviersity of Tel-Aviv.

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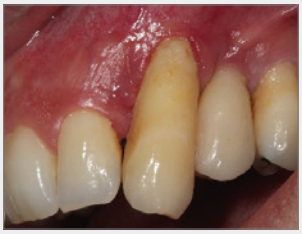
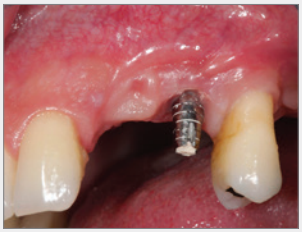
Abstract

This case study presents a consequence of periodontal destruction associated with localized aggressive patient disease, in a 31-year old patient. A subsequent alveolar bone resorption following extraction of tooth 23 **(Fig. 1-2)**, has led to a Seibert class 3 bone deficiency lacking both buccal-palatal and vertical dimensions. Placing an implant in a narrow crest lacking both vertical and horizontal dimensions would likely result in an unfavourable aesthetic restoration, and will be problematic for OH (Oral Health) maintenance. On the other hand, the results of placing a supra-crestal implant simultaneously with a lateral and vertical GBR is technique sensitive and its predictability is questionable. Since all other restorative possibilities were ruled out on the patient level, ridge augmentation using sonic welding together with NeO implant placement was chosen.



1 Upon arrival - mobility grade 3 of tooth 23



2 6 months post extraction of area 23

Case Overview

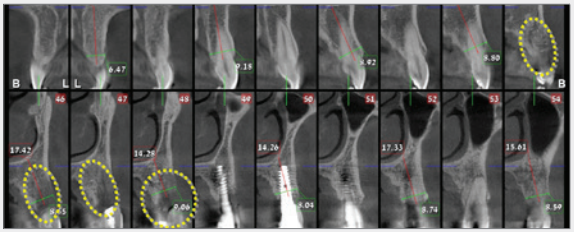
The patient is 31-year old male. He is generally healthy and reports being a transient smoker.

Extraoral Examination

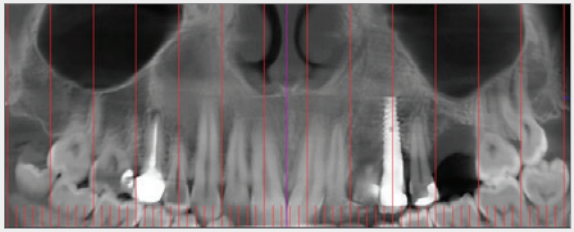
Mouth opening of 48 mm, no abnormalities in TMN or mastication muscles, low smile line.

Intra oral examination

Intra oral examination: Patient is diagnosed as localized aggressive periodontitis patient, exhibiting the loss of tooth 26 and a hopeless condition of 42 and 23 (over eruption, mobility 3, recession and loss of up to 80% of alveolar support) **(Fig. 2)**. The periodontal disease is centered on these three teeth. Periodontal indices are mild to moderate for the rest of the dentition. Probing depth did not exceed 5 mm at any other site and BOP is 30% at first checkup. The patient insisted on a fixed restoration connected to a dental implant for tooth 23 and ruled out any removable prostheses or the use of pontics (either with FPD or a Maryland restoration). On CT scan **(Fig. 3-4)** (sections 45-49) the available bone was satisfying on the aspect of width and height, although the buccal cortical plate was partally missing in the coronal third.



3 Pre-op. CT scan

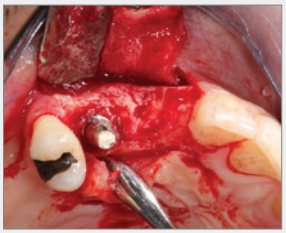


4 Preoperative panoramic X-ray

It was decided to use an Alpha-Bio Tec. NeO implant (Ø3.75 / L11.5 mm), combined with a lateral and vertical GBR, using a resorbable barrier fixed by resorbable screws (SonicWeld Rx® system), particulated Xenograft and a collagen resorbable membrane.

Surgical Procedure

Paracrestal and vertical buccal releasing incisions were made followed by full thickness flap elevation. **(Figs. 5-6)** Resorbable barrier **(Figs. 10-11)** made of a Poly-D-L-lactic acid polymer (Resorb-X®) which was welded on to resorbable pins (SonicPin Rx®) were previously inserted into the bone **(Figs. 7-9)**.



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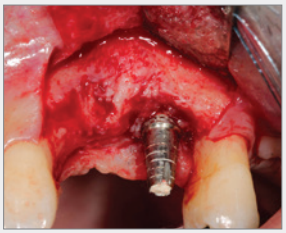

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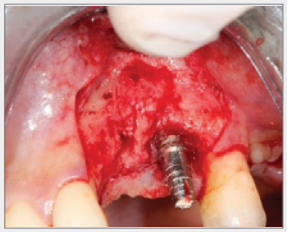
Flap elevation - crest exhibits satisfying width but only from approx. 6 mm apically to the CEJ of tooth 22



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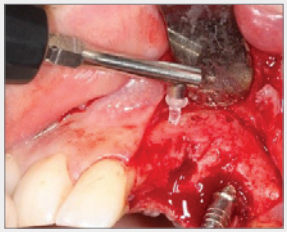

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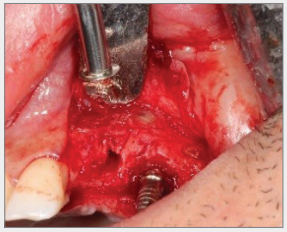

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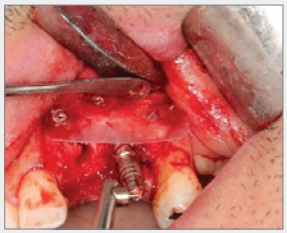
From left to right - preparation for the pins; placing the first pin out of 3



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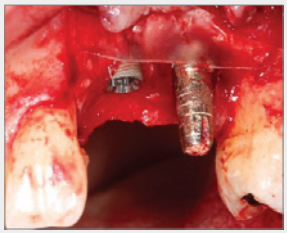

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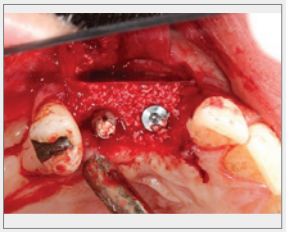
From left to right - resorbable PLGA membrane is placed and welded on to pins; Alpha-Bio Tec. NeO implant (Ø3.75 / L11.5 mm) is inserted and placed 4 mm supra-crestally

The welding is achieved using a SonicWeld Rx® unit, an ultrasound generator producing ultrasonic waves of precisely defined frequency that are focused with a sonotrode. Once the barrier is fixed, the Alpha-Bio Tec. NeO implant was placed supra-crestally in its preferred location (2-3 mm apically to CEJ of the adjacent teeth). The space between polymeric membrane and pristine bone was filled with a Xenograft. A resorbable collagen membrane was placed over the augmented area **(Figs. 12-13)**. Periosteal horizontal releasing incisions were performed at the base of the flap which was sutured without tension using Vicryl 4-0 sutures. A temporary prosthesis (24-X with metal reinforced wire) was placed without gingival or occlusal contact **(Figs. 14-16)**. Healing was uneventful.



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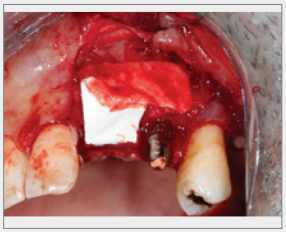

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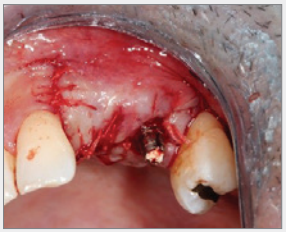
From left to right - space is filled with Xenograft and covered by a resorbable collagen membrane



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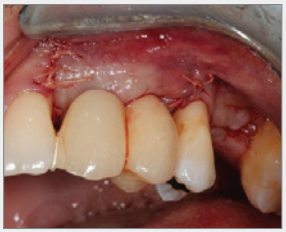

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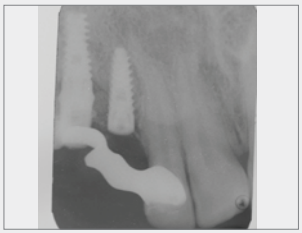
Surgical site is sutured using Vicryl 4-0, horizontal mattresses and simple interrupted sutures; temporary restoration in place over the operated area



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Post-op. X-ray

The case will be prosthetically finalized and updated in the coming months with the delivery of the final prosthetics to the patient.