Implant Placement with Simultaneous Bone Grafting
Using a Novel Alloplastic Particulate Graft Material

Peter Fairbairn, 1 Minas Leventis, 2 Ashish Kakar, 3 Monish Bhola, 1 Orestis Vasiliadis, 2 Charles Mangham 4

Topic: Basic research

Background and Aim

Background: The loss of the upper canine often leads to an extensive bone defect with the loss of the buccal plate due to its anatomical position in the alveolar crest (very buccal with only a thin layer of host bone) as well as higher co-axial forces applied when in function. Preservation and restoration of the bone subsequently can be challenging to achieve an adequate outcome both functionally and aesthetically.

Aim: To evaluate the efficacy of a novel biphasic synthetic particulate grafting grafting material consisting of β-tricalcium phosphate (β-TCP, 65%) and calcium sulphate (35%) in bone regeneration with a set protocol that has been used by the primary author for over 12 years.

Methods and Materials

In a series of ten patients with upper canine loss and an associated extensive buccal bone loss (>5mm by 8 mm in dimensions) the exact same protocol was employed using the biphasic grafting material (EthOss®, Regenamed Ltd, London, UK). This protocol involved 3 weeks soft tissue healing followed by implant placement at an altered angle, with site specific flaps and simultaneous bone grafting without the use of a membrane or autogenous material. All cases had placement and loading resonance frequency readings taken (Ostell IQ™, Göteborg, Sweden). A flap was raised at loading to verify the presence of regenerated bone 10 weeks post placement as well as to ensure correct fitment of the Ostell SmartPeg due to bone overgrowth. Core samples were taken above the implant whilst gaining access for abutment fitment in 2 of the cases for histologic analysis.

Results - Conclusions

Results: All cases were successfully loaded and the average placement ISQ of 44 was raised to 76 after a 10 week healing period. Clinical observation showed full coverage of the defect with up to 4 mm of new bone over the implant buccally and up to 3 mm vertically over the implant. Histological analysis showed up to 50% new bone formation at 10 weeks even at the core sample site directly over the implant.

Conclusions: Preliminary results from this study appear to back up long term results seen using similar biphasic synthetic particulates, where β-TCP in a calcium sulphate matrix was used. These findings suggest the viability of these materials to provide a scaffold for bone regeneration whilst themselves eventually being fully bio-absorbed and show the excellent osteogenic potential of the novel bone grafting material, permitting implant loading at 10 weeks. Further analysis will be needed with comparative materials to complete the study.

References