OBJECTIVE
Reconstruction of the deficient alveolar ridge requires using a space maintaining barrier to promote osseous regeneration. Guided bone regeneration using a space maintaining E-PTFE membrane had been successfully incorporated into the dental practice with predictable long term results. One of the disadvantages reported with using this membrane is premature exposure followed by infection and graft resorption. Using biodegradable collagen membranes overcomes the potential of membrane exposure yet does not give the ideal support and space maintenance required. A new biodegradable PLGA: TMC copolymer membrane with a space maintaining physical properties and a lasting barrier function of 12 weeks is reported.

MATERIALS AND METHODS
15 patients demonstrating severe ridge defects in height and width were selected for bone augmentation. After anaesthetizing the patient via local infiltration, a midcrestal incision was made to expose the residual alveolar ridge. Using a water-cooled, low-speed contra angled handpiece with a small round bur intra-marrow penetration was performed to induce revascularization and the influx of growth factors and platelets. In 10 patients the defect was filled with Allograft(Puros, Zimmer Dental Inc.) followed by placement of the PLGA:TMC Inion membrane 40 x 30 mm, 0.2 mm thick (one size). The membrane was treated with a plasticizer for 20 sec to allow adaptation of the softened membrane on the defect. Fixation of the membrane to the adjacent bone was achieved using biodegradable tacks 1.6 mm in diameter (Inion Inc Finland). Soft tissue closure was achieved without tension using 4.0 sutures (Vicryl, Ethicon Inc., Somerville, NJ). The patient was prescribed a postoperative antibiotic, antimicrobial rinse and analgesics. The treated sites were reentered 3-6 months postoperatively. Bone core biopsies were taken for histology in order to investigate the nature of the regenerated bone.

RESULTS
Postoperative healing exhibited no clinical evidence of infection and healing was uneventful. In two patients wound dehiscence was observed with no complications. The membranes were reepithelialized within the following 15 days post exposure. 3-6 months later, the patient was scheduled for exposure of the grafted site for implant placement. Under local anesthesia, surgical exposure revealed new bone formation with complete resolution of the former defect. No resorption was noted and there were no remnants of the biodegradable membrane. Bone core biopsies were taken for histology and implant osteotomies were prepared into the previously grafted site. Screw-type implants with a microtextured surface (MTX Tapered Screw-Vent, Zimmer Dental Inc., Carlsbad, CA) were threaded into place with a manual driver. The augmented bone remained stable throughout the implant integration phase and implants were restored with PFM fixed prosthesis.

CONCLUSION
These case series utilized a biodegradable PLGA:TMC space maintaining membrane with a lasting barrier function of 12 weeks. The three layer membrane provide stabilization and cell exclusion, maximizing the bone volume due to its stiffening effect and eliminates the need for second surgery for membrane removal. Exposure of the treated sites 3-6 months post operatively revealed new bone formation in the regenerated defects as shown in bone cores taken for histology. Within the limits of this study it can be concluded that using a biodegradable space maintaining membrane should be considered as an alternative treatment option to the non-resorbable barriers.