

Hes-1 were evaluated in MSCs cultured in the absence or presence of 0.5 mM Ba<sup>2+</sup>, to inhibit KCa1.1 channels, using RT-PCR, Western Blot and confocal immunofluorescence. Ionic currents were recorded with the whole-cell patch clamp technique.

**Results:** It was found that MSC proliferation was significantly enhanced after laser irradiation and this phenomenon was associated with the up-regulation and activation of Notch-1 pathway, and with increased membrane conductance through voltage-gated K<sup>+</sup>, BK and Kir, channels and T- and L-type Ca<sup>2+</sup> channels. We also showed that MSC proliferation was mainly dependent on Kir channel activity, on the basis that the cell growth and Notch-1 up-regulation were severely decreased by the pre-treatment with the channel inhibitor Ba<sup>2+</sup> (0.5 mM). Interestingly, the channel inhibition was also able to attenuate the stimulatory effects of diode laser on MSCs, thus providing novel evidence to advance our knowledge on the mechanisms of biostimulation after LLLI.

**Conclusions and clinical implications:** In conclusion, our findings suggest that diode laser (630 nm) may be a valid and safe approach for the preconditioning of MSCs *in vitro* prior cell transplantation for bone repair and regeneration.

## 505 Posters – Tissue Augmentation and Engineering

### Thickening of peri-implant mucosa using punched gingival graft

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**Background:** Computer-guided flapless surgical approach is a method by which one can precisely position implants using laboratory-fabricated surgical templates acquired from CT scans without reflecting a flap and merely through the oral mucosa. The flapless minimally invasive implant surgery has numerous advantages including better preservation of circulation, soft tissue as well as bone volume at the site. As data accumulate, dentists are learning that this method shortens the time of surgery, increases patient's comfort, accelerates healing and allows oral hygiene immediately following surgery. The clinicians are mostly of the opinion that long-term health and stability of the peri-implant soft tissues is possible with the presence of adequate soft tissue thickness or recommended 2.5–3 mm of keratinized gingival tissue (KGT) surrounding an implant restoration. A thin gingival biotype may serve as *locus minoris resistentiae* for development of soft tissue defects in the presence of biofilm-induced inflammation or tooth brushing trauma.

**Aim:** To preserve a deepithelized punched gingival graft excised during flapless surgery in computer-guided implant placement and to assess augmentation of KGT and/or localized defect of collapsed alveolar ridge.

**Methods:** In one female and five male patients, mean age 65.2 ± 9.9 years, eight small horizontal crestal incisions were

placed in the alveolar mucosa facial or lingual to the tightened implant already. These pouch-like preparations were performed where lack of keratinized gingiva or localized deficiency of bone and soft tissue was found. At the start of flapless implant placement a punched gingival tissue taken with trephine (4 mm in diameter) was deepithelized and preserved in saline. Finally, this connective graft was placed into the pouch in order to gain the apico-coronal augmentation of soft tissue profiles.

**Results:** 6–36 months after mucogingival therapy, <x> = 16.0 ± 11.8 months, seven cases demonstrated increase in the width of KGT in apico-coronal direction reaching <x> = 2.8 ± 0.4 mm where previously the thickness was inadequate. The probing pocked depths of controlled sites were <x> = 2.4 ± 0.9 mm. The last patient showed marked gain and improvement of earlier deficient soft tissue profile 6 months after treatment.

**Conclusions and clinical implications:** Our preliminary data suggest that preserved punched deepithelized gingival tissue grafts integrate well and gingiva reaches adequate thickness and KGT width few months after surgery. This contributes to improved maintenance of stable peri-implant soft tissue environment.

## 506 Posters – Tissue Augmentation and Engineering

### Clinical and tomographic analysis of the increase in height and implant success after sinus lift: a 2-year follow-up

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**Background:** Maxillary sinus lift procedures with autogenous bone grafting or synthetic and implant placement have been extensively documented and reviewed. The residual crestal bone height as one of the most critical factors influencing implant survival rate.

**Aim:** The aim of retrospective investigation was to evaluate by means of computerized tomographic scans the increase in height after sinus floor augmentation with different bone grafting materials and implant clinical success after 2-year follow-up.

**Methods:** Forty-five patients (24 female, 21 male) aged between 29 and 84 years-old were undergone maxillary sinus lift procedures. The cavities were filled with particulate bone autogenous of retromolar area, anorganic bovine bone (Geistlich Bio-Oss®), association of autogenous/anorganic bovine bone or simultaneous implant placement with sinus lift and anorganic bovine bone. After 6–8 months the implants were placed and measured torque values. The implant survival was defined when the prosthesis had been delivered and followed for 2 years without infection, pain, or more than 2-mm peri-implant bone loss. The computed tomography scans taken before and 6–8 months after elevation surgery. The height of bone