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smart regeneration

EFFECT OF HYADENT BG ON HUMAN GINGIVAL AND PALATAL FIBROBLASTS

Asparuhova MB, Kiryak D, Eliezer M, Mihov D, Sculean A 'Activity of two hyaluronan preparations on primary human oral fibroblasts' J Periodont Res. 2018; 00: 1-13. | Link to the abstract

CLINICAL RELEVANCE

Wound healing is an important aspect of surgical periodontal treatment and affects the outcome. Within this process, palatal and gingival fibroblasts play an important role. This study shows that from a biological point of view HYADENT BG positively affects the healing process, and that its application may therefore support wound healing in the context of surgical periodontal treatment.

STUDY DESIGN

Primary human palatal (HPF) and gingival (HGF) fibroblasts were obtained from human donors and cultivated. Cell viability, migration and proliferation were assessed for the control group (no hyaluronic acid) and test group (HYADENT BG; Hya). Quantitative RT-PCR was used to investigate the expression of several genes including COL1A1, COL3A1, TGF-β1, TGF-β3, PDGFB, FGF2 and EGF.

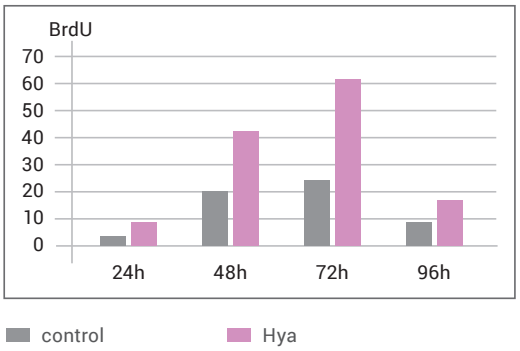
RESULTS

The cell viability of the isolated HPF and HGF remained very high without visible differences between the control and Hya groups. After 24h, 48h, 72h and 96h the cellular proliferation rate was significantly increased with Hya compared to untreated cells for both cell-lines, except for the HGF cells at 24h. Hya treatment did not influence the expression of COL1A and TFG-β1, which are generally known to lead to fibrotic healing with scars. However, contact with Hya significantly increased the expression of COL3A and TGF-β3 in both cell types and the respective gene products collagen type III and TFG-β3 are both predominantly involved in scarless wound healing.[1,2] In addition, the presence of Hya led to a significantly increased expression of the growth factors PDGFB, FGF-2 and EGF which are known to stimulate cell proliferation and migration in a dose dependent manner.[3,4]

CONCLUSION

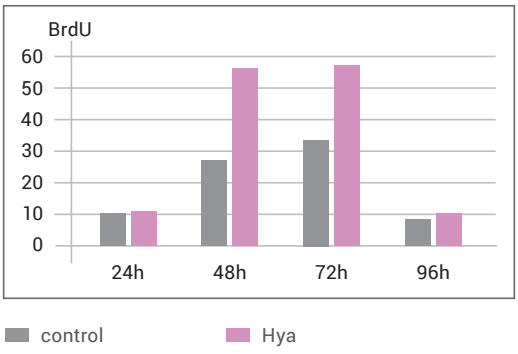
HYADENT BG has various positive biological effects on human palatal and gingival fibroblasts, which are involved in soft tissue regeneration in the context of surgical periodontal treatment. The demonstrated pro-wound healing and pro-proliferative effects of hyaluronic acid explain its positive influence observed in several clinical studies.[5,]

PROLIFERATION RATE OF HUMAN PALATAL FIBROBLASTS



Graphs 1: The graph shows rates of human palatal fibroblasts after 24h, 48h, 72h and 96h. The results show a statistical significant higher increase of cells (assessed by BrdU) in the Hya group at all timepoints

PROLIFERATION RATES OF HUMAN GINGIVAL FIBROBLASTS



Graphs 1: The graph shows rates of human palatal fibroblasts after 24h, 48h, 72h and 96h. The results show a statistical significant higher increase of cells (assessed by BrdU) in the Hya group at all timepoints

1. Cuttle L et al' Collagen in the scarless fetal skin wound: detection with Picrosirius-polarization.' Wound Repair Regen. 2005;13:198-204.
2. Lichtman MK, et al 'Transforming growth factor beta (TGF-β) isoforms in wound healing and fibrosis.' Wound Repair Regen. 2016;24:215-222.
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6. Pilloni A et al., Clinical Oral Investigations https://doi.org/10.1007/s00784-018-2537-4

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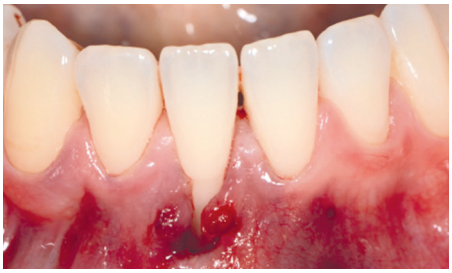
DEEP MILLER CLASS II RECESSION

CLINICAL CASE PROVIDED BY PROF ANTON SCULEAN, BERNE, SWITZERLAND



1a. Baseline

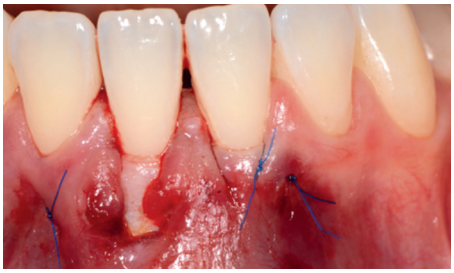
1b. Tunnel

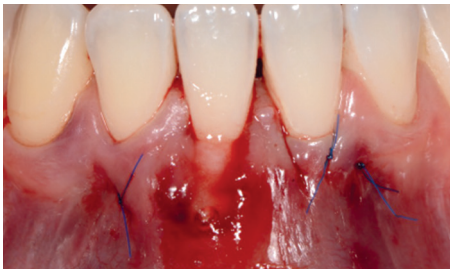
2a. Mobilized tunnel

2b. Connective tissue graft (CTG)

3a. Application of HYADENT BG.

3b. Applied HYADENT BG in the tunnel.





4a. Connective tissue graft fixed in the tunnel.

4b. Repeated application of HYADENT BG on the connective tissue graft.

5a. Laterally closed tunnel.

5b. Outcome after 6 month.

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