

OP22 IMMUNOHISTOCHEMICAL EVALUATION OF THE EFFECTS OF UNDIFFERENTIATED MESENCHYMAL STEM CELLS DERIVED FROM DIFFERENT TISSUES ON TOOTH MOVEMENT

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AIM: To compare the effects of mesenchymal stem cells (MSCs), derived from four different tissues [rabbit dental pulp (rDP), periodontal ligament (rPDL), bone marrow (rBM) and adipose tissue (rAT)] on tooth movement in a rabbit model.

MATERIALS AND METHOD: Tooth movement animal models were established in 25 New Zealand rabbits and randomly divided into four experimental groups (n = 5) and a control group (n = 5). 1×10^6 cells/1 ml which were PKH26 positive; rDP-MSCs (group 1), rPDL-MSCs (group 2), rBM-MSCs (group 3) and rAT-MSCs (group 4) were locally injected into alveolar bone and periodontal space for each tooth in the experimental animals and physiological saline solution at the same volume into control group before loading orthodontic force and on the 7th and 14th days of tooth movement. A helical spring fabricated from 0.014 in stainless steel wire was used for applying force and orthodontic tooth movement was planned for 21 days. The distance between the incisors was measured on days 1, 4, 7, 10, 14, 17 and 21 using a digital calliper. All rabbits were sacrificed on the 21st day of tooth movement. Histological analyses were performed in all animals, as well as analysis of RANKL, OPN, cathepsin-k, collagen-1 and tumour growth factor-1 markers by immunohistochemistry. Kruskal Wallis tests were used for intergroup comparisons.

RESULTS: Statistical analysis showed that there were no significant differences in the amount of tooth movement among the five groups ($P > 0.05$). PKH26 positive stem cells were observed under fluorescence microscopy in all experimental groups. Histological analyses showed that PKH26 positive stem cells produced new bone on the tension side.

CONCLUSION: Application of MSCs derived from different tissues has no effect on the rate of tooth movement in rabbits when compared with a control group.