Khalil HF et al., Madridge J Dent Oral Surg. 2019
http://dx.doi.org/10.18689/2639-0434.a3.002

3rd International Conference on
Dentistry

April 10-11, 2019 Valencia, Spain

Dental Pulp Stem Cells Usage for Furcation Perforation Repair (An Animal Study)

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Aim: To evaluate the possibility of hard tissue formation for repair of furcal perforation by using dental pulp stem cells.

Methods: The mandibular first molar teeth were bilaterally extracted in six dogs and transported to laboratory. The dental pulp stem cells were extracted using collagenase digestion and cultured. Cultured cells in Collagraft Bone Graft Matrix pieces impregnated with 10 ng/100Ml DMP1, was used to repair a furcation perforation autologously in the dogs and Teeth were coronally restored. Dogs were divided into three groups according to postoperative observation periods of 2 dogs, 16 teeth each: Group I (1 month), Group II (2 months) and Group III (3 months). At the end of every observation period the dogs were pharmacologically euthanized and histological sections were prepared. The Parameters evaluated were presence or absence of hard tissue bridge, Area fraction of newly formed hard tissue and Histopathological changes. Data were collected and statistically analyzed. ANOVA test was used for parametric variables. Turkey post hoc tests were used in case of significance. Fisher exact test was used for nonnumeric values

Results: 88.9% of the experimental samples showed hard tissue bridge, 11.1% of the experimental samples showed no hard tissue bridge formation. Statistical analysis showed a significant difference present between Group III and both of Groups I and II (P value = 0.001) in Area fraction of newly formed hard tissue. Negative control samples showed normal organized bone architecture and normal periodontal ligaments. Positive groups showed varying degrees of epithielium (50%) and well organized fibrous granulation tissue (50%) formed at the perforation site. 100% of the experimental samples showed new hard tissue most samples (94.4%) had acellular deposits of globular pattern.

Conclusion: Dental pulp stem cells and Dentin matrix protein 1 growth factor have the potential to form hard tissue.

Biography:

Hala Fayek Khalil is the Lecturer of Endodontics, Faculty of Dentistry at The British University in Egypt. He got the Doctorate Degree of Specialty (DDS) in Endodontics at Ain Shams University, Egypt. He got his Master's Degree (MD) of conservative dentistry at Ain Shams University, Egypt and Bachelor's Degree in oral and dental Medicine from Cairo University.