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Stem cells from exfoliated deciduous teeth, a way for pulp and dentin regeneration (an animal study)

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Dental pulp tissue has the potential to regenerate dentin in response to stimulations. Thus, stem cell therapy has considerable a promise in pulp dentin regeneration. The aim of this study is an in-vivo evaluation of pulp's stem cells capacity in pulp and dentin regeneration in dogs. To isolate stem cells, one Iranian mixed-breed, 5-months dog was used. The deciduous tooth was extracted. Pulp of the tooth was isolated and exposed to type 1 collagenase enzyme. Isolated cells were cultured on Dulbecco's modified Eagle's medium (DMEM), supplemented with 10% fetal bovine serum (FBS) and 1% antibiotic. Polyglycolate (PGA) scaffolds were prepared and sanitized in 75% ethanol and seeded with 4×10^4 cells. Twenty anterior and premolar dogs' teeth underwent shallow pulpotomy. Then all teeth were divided to three groups. Twelve teeth transplanted

with seeded scaffolds and then cavities were filled with MTA and Amalgam. Control groups consisted of four teeth with unseeded PGA restored with MTA and Amalgam and four teeth with only MTA and Amalgam. Eight weeks after transplantation, samples were histologically analyzed. Mann Whitney U test was used to compare inflammation, calcific barrier and hyperemia and Chi-square test to compare necrosis and Odontoblastic layer formation. There was no significant difference between 3 groups except for calcified barrier type between group 1 and 2, Dentin like matrix, collagen fibers and small vessels observed in the cavity in group using stem cells. The results of the study suggest the possibility of pulp and dentin regeneration with stem cells in damaged teeth.

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