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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 promise in the field of 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. In order to isolate stem cells, one Iranian mixed-breed and 5-months dog was used. The deciduous tooth was extracted. The pulp of 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 into three groups. 12 teeth were 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.

Biography

Shirin Shahnasari is working as an Assistant Professor of Oral and Maxillofacial surgery in Isfahan University of Medical Sciences since 2010. She has been researching since 2005 and her special research field is harvesting of stem cells from adipose tissue for maxillofacial alveolar cleft reconstruction. She had done some project under process for TMD treatment by harvesting chondroblast from stem cells and pulp regeneration by stem cells harvested from deciduous teeth.

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