TS23
Regenerative endodontics: revascularization in an immature permanent tooth using platelet rich plasma (PRP) evaluated with dental computed tomography

A Chandra[1] and C Rathinavel[2]
[1]*Professor, Department of Conservative Dentistry and Endodontics,Faculty of Dental Sciences,KingGeorge Medical University;* [2]*Department of Conservative Dentistry and Endodontics, Faculty of Dental Sciences, King George Medical University*

Introduction: Regenerative medicine offers several advantages for the treatment of disease with its aim of "replacing or regenerating human cells, tissues or organs to restore or establish normal function". Considerable recent enthusiasm and effort towards the application of regenerative therapy in endodontics is leading to an exciting future potential for engineering not only pulp tissue but also whole tooth. Regenerative endodontic procedures can be defined as biologically based procedures designed to replace damaged structures, including dentin and root structures, as well as cells of the pulp-dentin complex. Various approaches include root-canal revascularization, postnatal (adult) stem cell therapy, pulp implant, scaffold implant, three-dimensional cell printing, injectable scaffolds and gene therapy. This case report presents revascularization of pulp in necrotic immature tooth which is one of the most conservative and practical approaches of this revolutionary therapy.
Discussion: The PRP enabled revascularization of root canal by acting as a biological scaffold. It can cause the sustained release of growth factors, enhancing the recruitment, retention, and proliferation of undifferentiated mesenchymal and endothelial cells from the periapical area. It stimulates collagen production. It also produces anti-inflammatory agents (ANTES/CCL5 [Regulated upon activation, normal T-cell expressed, and secreted, a protein classified as a chemotactic cytokine or chemokine]) that controls the local inflammation and improves soft- and hard-tissue wound healing.
Conclusion: Based on the results of our study, we conclude that tissue regeneration in root canal is possible in necrotic immature tooth using PRP. Replacement of the necrotic pulp by vital tissue is better than replacement with biomaterials, gutta-percha and root canal sealer.

TS24
Silk-based 3D biotextiles support human adipose derived stem cells towards osteogenic differentiation

VP Ribeiro[1,2], AS Ribeiro[4], CJ Silva[4], NF Durães[4], G Bonifácio[5], AP Marques[1,2], RA Sousa[1,2], AL Oliveira[1,2,3] and RL Reis[1,2]
[1]*3Bs Research Group–Biomaterials, Biodegradables and Biomimetics, Univ. of Minho, Headquarters of the European Institute of Excellence on Tissue Engineering and Regenerative Medicine, AvePark, Guimarães, Portugal;* [2]*IBB–Institute for Biotechnology and Bioengineering, PT Associated Laboratory, Guimarães, Portugal;* [3]*Department of Health Sciences, Portuguese Catholic University, Viseu, Portugal;* [4]*CeNTI, Centre for Nanotechnology and Smart Materials, V.N. Famalicão, Portugal;* [5]*CITEVE, Technological Center for Textile and Clothing Industry*

Textile-based technologies are considered as potential routes for TE applications, since they allow for producing finely tuned fibre-based porous scaffolds with a very reproducible and interconnected intra-architectural geometry, increasing the surface area for cell attachment and tissue ingrowth. Human Adipose-derived Stem Cells (hASCs) constitute an emerging possibility for regenerative medicine and tissue replacement therapies. Their osteogenic differentiation potential, easy isolation, expansion and *in vitro* proliferation demonstrate their promising prospects in bone regeneration. The present work aims at evaluating the potential of recently developed 3D silk-based biotextile structures to support hASCs adhesion, proliferation and osteogenic differentiation. The 3D spacer structures were processed by using a knitting technology. Two knitted silk layers were assembled and spaced by a monofilament of polyethylene terephthalate (PET). A 3D structure made entirely of PET was also used for comparative purposes. Cells were seeded over the constructs for 7, 14, 21 and 28 days in basal and osteogenic conditions. HASCs adhesion, proliferation and the osteogenic differentiation potential of the textile structures were analysed through Scanning Electron Microscopy (SEM) and preliminary biological assays: alkaline phosphatase (ALP), DNA and Ca^{2+} quantification. The obtained results validate the developed constructs as suitable for hASCs adhesion, proliferation and differentiation into an osteoblastic lineage. Great evidences of extracellular matrix mineralization were observed as well as a deeply cell penetration and colonization into the scaffolds interior. The positive influence of the produced fibre-base architecture on the osteogenic differentiation of hASCs and ECM production validates thistechnology for being used in bone TE. Moreover, the versatility and reproducibility of this knitting technology can allow for further industrialization of TE products.