

Operative Dentistry and Biomaterials for Tooth Regeneration

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Abstract

Tissue-engineered biomaterials have existed approximately 40 years as simple biomimetic structures. Replacement of human tissue with new tissue can be accomplished by generating replacements outside of the body or in situ in the body. In each case, the key elements are described as the tissue engineering triad of scaffolds, cells, and signals. Scaffolds can be produced synthetically or derived naturally. Similar to other sciences, operative dentistry has been using regenerative approaches to treat dental disease. The use of calcium hydroxide or Mineral Trioxide Aggregate to stimulate reparative or reactionary dentin is clearly an example of such a therapeutic strategy. Tissue engineering is a multi-disciplinary science that brings together biology, engineering and clinical sciences with developing new tissues and organs. It is based on fundamental principles that involve the identification of appropriate cells, the development of conducive scaffolds and an understanding of the morphogenic signals required to induce cells to regenerate the tissues that were lost. In this paper is focused on the presentation and discussion of existing literature that covers the engineering of enamel, dentin and pulp, as well on the engineering of entire teeth. There are clearly major road blocks to overcome before such strategies move to the clinic and are used regularly to treat patients. However, existing evidence strongly suggests that the engineering of new dental structures to replace tissues lost during the process of caries or trauma will have a place in the future of operative dentistry.

Keywords: Tooth Regeneration, Operative Dentistry.

Poster Presentation

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