A new approach to root formation

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Abstract
In endodontics, treatment of an open apex tooth with necrotic pulp is a problem. It seems that with promotion of remnants of Hertwig’s epithelial sheath or rest of malassez accompany with a good irrigation of root canal we can expect root formation. (Iranian Endodontic Journal 2008;3:42-43)

Keywords: Hertwig’s root sheath, IGFs, Tooth root formation.

Received October 2007; accepted February 2008
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Core of idea
In endodontics, we encounter with cases that are open apex. Root canal therapy of these canals accompany with necrotic pulp is apexification apical plug (1).

One of the effective manners to disinfection of the canal is copious irrigation with 5.25% NaOCl and the use of a mixture of antibiotics even without mechanical instrumentation (3).

Activity of cementoblasts and other regenerative cells is influenced by growth factors such as epidermal growth factor (EGF), transforming growth factor-β (TGF-β) and insulin-like growth factors (IGFs)(5).

IGFs represent a family of endocrine, paracrine and autocrine-acting polypeptide growth factors controlling pre and post natal development and growth processes.

In general, the IGF ligands, IGF-I and IGF-II are involved in various cellular process, including differentiation, proliferation, morphogenesis, growth and control of metabolic functions (6). Werner and Katz (7) have highlighted the emerging role of this growth factor system in tooth development, growth and PDL homeostasis.
IGFs are believed to behave as proliferative factors for PDL cells (8) epithelial cells of Hertwig’s root sheath (9) or cells of Malassez (10). Therefore, the IGF system plays an important role in the regulation of bone remodeling, especially in the coupling of resorption and apposition (11). Also these factors especially IGF-II and its preferential binding proteins (IGFBP-6 and IGFBP-5) have shown an involvement in the resorption repair sequence of roots (12).

Therefore it is logical that intracanal usage of solution contain high concentrate of these factors (synthetic or naturally extracted) can promote proliferation of PDL, remnant of Hertwig’s root sheath or rests of Malassez and cementoblasts. And we would be expected the interrelation signaling between external proliferated cells and in growth undifferentiated cell followed by pulp regeneration, that result in root formation. Probably, this protocol will be on alternative treatment for immature or resorpted teeth, to prevent unwonted complication of rot shortening and difficult apical sealing.

References