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Early orthodontic intervention: Why, when and how?

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Early orthodontic intervention during primary and early mixed dentition has been a matter of controversies between practitioners. The aim of this presentation is to focus into two major aspects of this problem. First part is a brief discussion of morphogenesis of the problem and sequel of postponing the treatment. The second part would be presentation of some simple intervention at proper time that can prevent or intercept the major future problems. Development of dental occlusion from tooth formation, eruption until a full complement of permanent dentition is a long process lasting over 20 years. During this process cranio-facial bones growth, neuromuscular functions and soft tissue structures surrounding the dentition are also interacting, which govern the final teeth relation and leads occlusal inter digitation. This long formative period make it possible for many environmental/genetic influences to affect the dentition and facial morphologies, such as primary tooth loss, early or delayed exfoliation, and deleterious oral habit and all craniofacial dysfunctions or cranial posture. Research has shown that many dentoskeletal deformities which form during primary or early mixed dentition are not self corrected and become worse in some situations causing other complication, while early detection and intervention can easily be accomplished at those ages. In this presentation some of these deformities, such as posterior and anterior cross bites class III maxillary deficiency, crowding, abnormal habits and muscle dysfunction will be demonstrated.

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Role of nano gelatin and hydrogel based scaffolds in odontogenic differentiation of human dental pulp stem cells

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The objective of this study is to evaluate and compare the role of nano-gelatin and bioengineered scaffolds on the attachment, proliferation, and osteogenic differentiation of human dental pulp stem cells (DPSCs). Tooth decay and early fall has been one of the most prevailing dental disorders which cause physical and emotional suffering and compromise the patient's quality of life. The design of novel scaffolding materials will be based on mimicking the architecture of natural dental extracellular matrix which may provide as *in vivo* environments for proper cell growth. This methodology will involve the combination of nano-fibred gelatin as well as biodegradable hydro-gel based tooth scaffold. We have measured and optimized the dental pulp stem cells growth profile in cultures carried out on collagen coated plastic surface, however, for tissue regeneration study, we aim to develop an enhanced micro-environment for stem cell growth and dental tissue regeneration. We believe bio-mimetic cell adhesion and scaffolds might provide a near *in vivo* growth environment for proper growth and differentiation of human DPSCs, which further help in dentin/pulp tissue regeneration.

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