Minimal Invasive Post Endodontic Monoblock Restorations Forerupting Permanent Molars During Adolescence Period

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Abstract

The restorative treatment of non-vital teeth is a common problem for dentists. In pediatric dentistry, partially erupted molars with extensive coronal destruction or less coronal height have an insufficient crown height to gain retention for the full crown cast restoration; Endocrown appears to be a suitable option for restoring the endodontically treated teeth in these situations. Although the traditional crown supported by radicular metal posts is still extensively used in dentistry, it has been heavily criticized for its invasiveness. There are currently new materials and treatment possibilities based solely on adhesion.

Over the last few decades, advancements in adhesive dentistry have made significant contributions to cosmetic and restorative dentistry. The endocrown is advised for the repair of severely damaged molars, which necessitates the use of particular restoration techniques to meet biomechanical criteria. The endocrown is recommended when the pulp chamber provides suitable conditions for retention. The coronal portion of an endocrown is merged into the apical projection, which occupies the pulp chamber space and possibly the root canal openings.

The endocrown preserves tooth structure while being minimally invasive. Because of their good physico-mechanical-and aesthetic qualities, both polyether ether ketone (PEEK) and leucite-reinforced glass ceramic has recently become more widely used in a number of therapeutic contexts. Clinical investigations have demonstrated that the endocrown has a long functional life, and it has emerged as a potential option for the cosmetic and functional restoration of endodontically treated molar teeth. The current lecture will discuss endocrown for from A-Z and showing clinical cases on endotreated erupting permanent molars. Until the day when diseased pulps can be regenerated, they have to be replaced by some form of restorative materials.

With the rigidity of the root weakened by endodontic and restorative instrumentation, the sealing quality and tooth strengthening potential of endodontic replacement monoblocks become important issues. Strengthening of immature root canals with open apices and reduced circumferential dentin thickness are also issues of concern. The prolonged use of calcium hydroxide as an apexfication stimulation material results in an increase in the incidence of spontaneous cervical root fracture or fracture after minor impacts.

Using 3D-speckle interferometry to examine the rigidity of maxillary anterior teeth after different endodontic procedures in response to a load of 3.75 N, root deformation after endodontic access preparation was found to increase significantly from 0.24 ± 0.03 μm in intact roots to 0.36 ± 0.04 μm after preparing an access cavity.

Presumably, when such root canals are subjected to clinically relevant forces (100 N), their flexures would reach clinically relevant levels. Shaping of the canals manually with stainless steel K-files from ISO #40 to ISO #110 resulted in a gradual but non-significant increase in root deformation. Preparation of a tapered post space resulted in a significant destabilization of the teeth with deformation up to 0.57 ± 0.04 μm.

The greatest deformation was observed with a parallel-sided post preparation, with a threefold increase in tooth deformability to 0.73 ± 0.09 μm (6). In another study using strain gauges attached to the cemntoenamel junction to measure root stiffness, it was observed that endodontic procedures such as access preparation, shaping and obturation only reduced the relative stiffness of the roots by 5%.

By contrast, an occlusal cavity preparation down to the cementoenamel junction level reduced the relative stiffness by 20%. The largest losses in stiffness were related to the loss of marginal ridge integrity, so that an MOD cavity preparation resulted in an average of a 63% loss in relative cuspal stiffness.

Citation: Nagy Abdulsamee; Minimal Invasive Post Endodontic Monoblock Restorations Forerupting Permanent Molars During Adolescence Period: 7th International Conference on Pediatrics, Neonatology and Pediatric Surgery, October11-12, 2021, Webinar

Volume11• Issue S(2)