

Regenerative Endodontic Treatment of Mature Necrotic Permanent Teeth Using Hyaluronic Acid Gel: A Case Report

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INTRODUCTION

Regenerative endodontic procedures (REPs) have been used to successfully treat mature teeth with necrotic pulp and apical periodontitis.⁽¹⁾ The bioengineering approach for dental pulp regeneration requires the incorporation of a scaffold, which can conduct regeneration of the pulp-dentin complex.⁽²⁾ Most reported cases induce a blood clot however, insufficient bleeding and the lack of regeneration of true dentin/pulp like tissue has stemmed the search for novel scaffolds.⁽³⁾ Hyaluronic Acid-based injectable filler is an FDA-approved facial dermal filler. Furthermore, Hyaluronic acid is biocompatible and biodegradable making it a potential scaffold for dental pulp regeneration.⁽⁴⁾

METHODOLOGY

A healthy 20 years old female patient was presented to the department of Endodontics at Alexandria University. The patient's chief complaint was history of trauma and swelling related to the upper left central incisor. The tooth was tender on percussion and responded negatively to cold and electric pulp testing. Diagnosis was necrotic pulp with asymptomatic apical periodontitis. On the first visit, access opening and canal instrumentation were performed up till X3 Protaper next files (Dentsply Maillefer, Ballaigues, Switzerland) Irrigation of the canal by 1.5% NaOCl using side vented needle (Kerr, Switzerland). Calcium Hydroxide (Ultracal XS; Ultradent products, Inc) was delivered and access cavity was temporized by intermediate restorative material (Dentsply Maillefer, Ballaigues, Switzerland.). After 2 weeks, anesthesia without vasoconstrictor (Septodont, France) was administered. Calcium hydroxide was flushed with 1.5 % NaOCl followed by 20 ml of 17 % EDTA (Prevest direct). Bleeding was induced 2 mm below the CEJ level by over-instrumenting a pre-curved K-file #25 past the apical foramen. Hyaluronic acid hydrogel scaffold (QMed, Uppsala, Sweden) was injected and Biodentine (Septodont, Saint-Maur-des-Fosses, France) was used as the capping material. The tooth was restored with light cure resin reinforced glass ionomer (Riva LC, SDI Limited, Victoria, Australia) followed by Nano hybrid composite resin (3m ESPE, St Paul, MN, USA). (Figure 1)

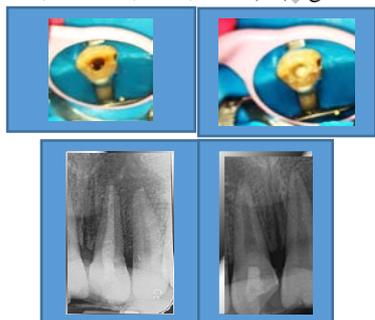


Figure (1): Steps of regeneration of upper central incisor

RESULTS AND DISCUSSION

Post-operative clinical follow up was done after 12 months. Resolution of clinical signs and symptoms was observed during the follow-up period. The tooth showed delayed response to electric and cold pulp testing. There was no pain or tenderness to percussion. Pre and Post-operative periapical radiographs and Cone beam computed tomographic analysis (CBCT) were performed before REPs at baseline then at the final recall visit after 12 months. The CBCT results showed decrease in the volume of the periapical lesion. Periapical healing was evident. (Figure 2)

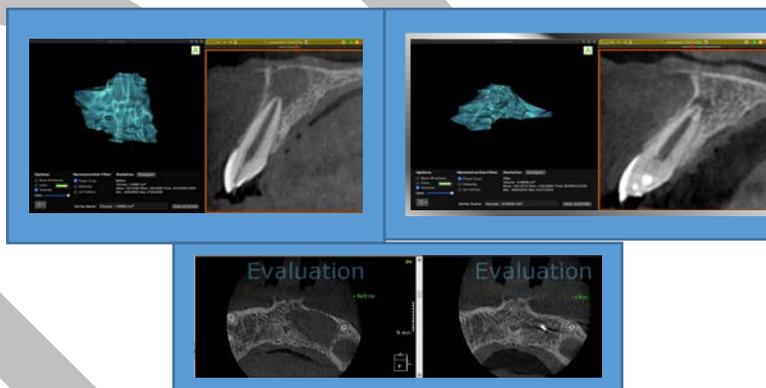


Figure (2): CBCT evaluation showing decrease of the lesion volume

CONCLUSION

Hyaluronic acid gel (Restylane) can be a promising scaffold for regenerative endodontic treatment of mature necrotic teeth with apical periodontitis.

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