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Partial regression of a healed periapical lesion in an endodontically treated premolar during orthodontic extrusion: A case report

KEYWORDS
Endodontically treated teeth;
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Orthodontic extrusion helps to enhance the restorability of teeth, as it can increase the amount of healthy coronal tooth structure to support coronal restoration.[1,2] Orthodontic movement influences the topography and morphology of the bone.[3–5] Yet, data in the literature about the impact of orthodontic movement on the healing of periapical lesion (PAL) in endodontically treated teeth is scarce and inconclusive.[3] Some research suggests that the changes in a PAL, including its persistence, partial regression, or even increase, occur independently of orthodontic movement.[4] In contrast, other study has reported expedited healing of PAL following orthodontic extrusion.[5] This article presents a case involving partial regression of a healed PAL in an endodontically treated premolar concurrent during orthodontic extrusion.

A 27-year-old male patient presented with a chief complaint of chewing pain in tooth #35 for three years. The chewing pain had intensified over the past two days. The periapical radiograph indicated substandard quality of the previous root canal treatment and revealed a large radiolucent area surrounding the apex (Fig. 1A). The diagnosis for tooth #35 was symptomatic apical periodontitis. Root canal retreatment was proposed, and the patient provided written informed consent. The coronal restoration and metallic post were dismantled, and all secondary decay was meticulously removed, leaving the remaining distal crown structure extending 1 mm below the gingival margin. To facilitate subsequent coronal restoration, post-root canal retreatment options were presented to the patient, including orthodontic extrusion, surgical extrusion, or periodontal crown lengthening procedures. The patient selected orthodontic extrusion. The tooth #35 was isolated with a rubber dam and root canal retreatment procedures were performed under a dental operating microscope. A 5 mm apical plug was created with calcium silicate-based bioceramic putty (Fig. 1B). The tooth underwent a build-up using a fiber post and a composite resin core (Fig. 1C). Orthodontic extrusion was advised at the 3-month follow-up following root canal retreatment, given that tooth #35 showed no symptoms and PAL had substantially healed (Fig. 1D). At the 4-month follow-up after orthodontic extrusion, tooth #35 exhibited a partial regression of the

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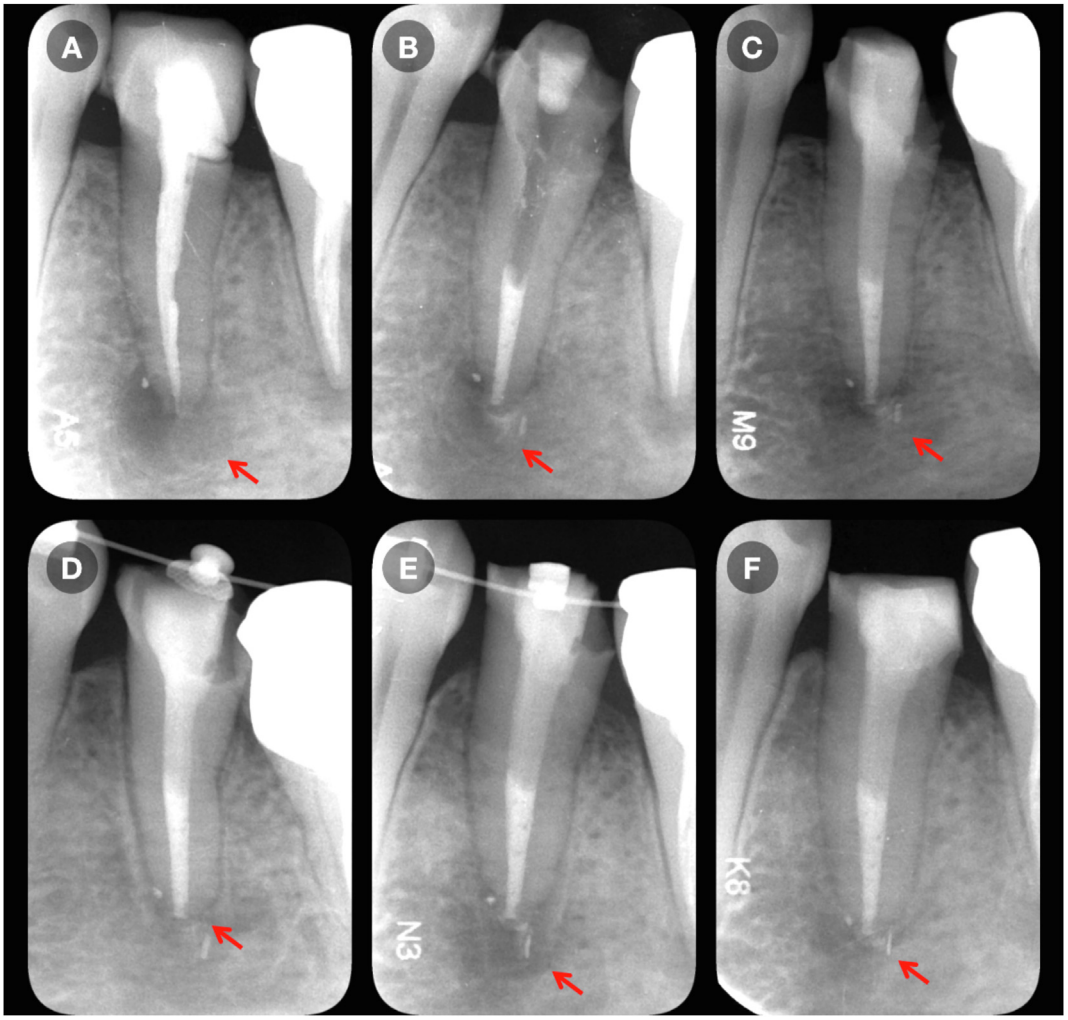

Figure 1 Pre- and post-treatment periapical radiographs of our patient. (A) Pre-operative periapical radiograph indicated substandard quality of the previous root canal treatment and revealed a large periapical lesion (PAL) surrounding the apex. (B) During root canal retreatment, a 5 mm apical plug was created with calcium silicate-based bioceramic putty. (C) The tooth underwent a build-up using a fiber post and a composite resin core. (D) At the 3-month follow-up following root canal retreatment, the PAL had substantially healed. (E) At the 4-month follow-up after orthodontic extrusion, tooth #35 exhibited a partial regression of the healed PAL. (F) At the 7-month follow-up, the PAL had significantly healed.

healed PAL yet remained asymptomatic (Fig. 1E). Since the tooth structure has been raised to a level suitable for restoration, it is suggested that the orthodontic apparatus be dismantled. Regarding the observed regression of the healed PAL, monitoring is recommended. Should there be an expansion of PAL or onset of symptoms in the tooth, endodontic microsurgery may need to be contemplated. Fortunately, by the 7-month mark, the PAL had fully healed and tooth #35 remained asymptomatic (Fig. 1F). Tooth #35 was then scheduled for a full crown restoration.

Given the scarcity of current research, it is difficult to determine the exact cause of regression of a healed PAL concurrent during orthodontic extrusion, though it may be related to improper application of orthodontic forces. In cases where the tooth remains asymptomatic, removing orthodontic appliance and monitoring might be the preferred approach. Additional research is necessary to explore the effects of orthodontic extrusion on the healing of PAL.

Declaration of competing interest

The authors have no conflicts of interest relevant to this article to declare.

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