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Management of an endodontic lesion with secondary periodontal ligament changes in an adjacent tooth following root perforation: Two-year follow-up

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Endodontically treated teeth may occasionally present with endodontic pathology due to procedural mishaps,[1] i.e., iatrogenic perforations. Root perforations pose a significant clinical challenge as they can compromise the prognosis,[2] and mimic the pathology of adjacent teeth, thereby complicating diagnosis. The advent of calcium-silicate biomaterials has improved the prognosis of perforated teeth by providing effective filling/sealing and favorable outcomes.[3] This report presented the successful management of a mandibular molar with an iatrogenic root perforation and associated secondary periodontal ligament (PDL) changes in an adjacent tooth, highlighting the diagnostic considerations and long-term healing outcome.

A 44-year-old woman was referred with persistent discomfort in the left mandibular first molar. She reported that tooth 36 had undergone root canal treatment approximately one year earlier and had been restored with a porcelain-fused-to-metal (PFM) crown. Despite the treatment, the patient remained dissatisfied due to ongoing symptoms and intermittent discomfort. Clinical examination revealed that tooth 36 was restored with a full-coverage PFM crown. Periodontal probing depths were within normal limits (<3 mm), and tooth 36 was not tender to palpation/percussion. Adjacent tooth 35 exhibited a distal proximal caries but no clinical signs of pulpal involvement. A preoperative periapical radiograph demonstrated an interdental radiolucency associated with tooth 36, extending toward the distal aspect of tooth #35 at the end of a prefabricated post in the mesial root (Fig. 1A). Additionally, the apical two-thirds of the PDL space of tooth 35 appeared widened. These findings could suggest primary pulpal disease in tooth 35; however, further interpretation indicated that the lesion originated from tooth 36. A suspected iatrogenic root perforation in the mesial root of tooth 36, related to the previous post preparation, was considered to be the source of infection/communication contributing to lesion spread. The PDL changes in tooth 35 were therefore interpreted as secondary/reactive alterations rather than true endodontic involvement.

After informed consent was obtained, the crown was removed, and nonsurgical endodontic retreatment was initiated. In the mesial canals, instrumentation was limited to just beyond the perforation site to improve disinfection while preserving the acceptable existing obturation, whereas the distal canal was managed conservatively with an orifice barrier approach. The suspected perforation site

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Figure 1 Radiographic images of a mandibular left molar with an endodontic lesion due to a root perforation managed with perforation repair using calcium-enriched mixture (CEM) cement. (A) Preoperative periapical radiograph showing interdental radiolucency associated with tooth 36, extending to the distal aspect of tooth 35. Note the widened periodontal ligament space in the apical part of tooth 35 (arrows) and the prefabricated post in the mesial root of tooth 36. (B) Immediate postoperative periapical radiograph following nonsurgical endodontic retreatment of tooth 36. The mesial canals were cleaned and shaped to approximately half working length, and the distal canal was managed with an orifice barrier approach. The suspected perforation site was repaired with CEM cement, with a small extrusion visible along the perforation tract. (C) Two-year follow-up periapical radiograph demonstrating complete healing of the endodontic lesion at tooth 36 and resolution of the secondary periodontal ligament widening at tooth 35.

was repaired and an orifice barrier established using calcium-enriched mixture (CEM) cement.[4] An unintentional/small extrusion of CEM was noted radiographically along the perforation tract in the immediate postoperative radiograph (Fig. 1B). Coronal restoration was accomplished using a sandwich technique, and the PFM crown was subsequently re-cemented. During the follow-ups, the patient was asymptomatic. Two-year radiographic evaluation demonstrated complete healing of the endodontic lesion at tooth 36 and resolution of the PDL space widening at tooth 35, confirming retreatment success (Fig. 1C).

This case illustrates that secondary PDL alterations in adjacent teeth can be misleading and should not be misinterpreted as primary pulpal involvement.[5] Careful radiographic evaluation and clinical correlation enabled the correct identification of the true etiology. Conservative retreatment, combined with the use of biomaterials, resulted in complete resolution of the lesion. The favorable healing outcome underscores the importance of accurate diagnosis, minimally invasive retreatment strategies, and the use of endodontic biomaterials in managing complex endodontic complications.

Declaration of competing interest

The author has no conflicts of interest relevant to this report.

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