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Tampon pulpotomy with calcium-enriched mixture cement for managing symptomatic irreversible pulpitis associated with a furcal lesion: A unique case report

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Tampon pulpotomy with calcium-enriched mixture cement for managing symptomatic irreversible pulpitis associated with a furcal lesion: A unique case report

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Management of symptomatic irreversible pulpitis (SIP) in mature permanent teeth has traditionally relied on root canal treatment (RCT). However, expanding clinical evidence supports vital pulp therapy (VPT/pulpotomy) as a biologically conservative alternative,[1] even in cases with symptomatic apical periodontitis (SAP).[2] We present a case in which tampon pulpotomy using calcium-enriched mixture (CEM) cement successfully preserved vitality and achieved complete healing of a furcal lesion associated with secondary periodontal involvement.

A healthy 35-year-old male presented with spontaneous/lingering pain in the right mandibular first molar (tooth 46), three months after placement of a composite restoration. Clinical examination revealed an exaggerated cold response, percussion tenderness, and an isolated furcal probing depth of more than 7 mm without generalized periodontal disease (Fig. 1A). The preoperative periapical radiograph showed a well-defined furcal radiolucency and periodontal ligament widening along the mesial root (Fig. 1B). The tooth was diagnosed with SIP and SAP associated with a primary endodontic lesion and secondary periodontal involvement. The patient consented to VPT.

After local anesthesia and proper isolation, the composite restoration was inspected, and the access cavity was prepared. A coronal pulpotomy was performed; however, persistent profuse bleeding prevented conventional hemostasis, even after application of a wet cotton pellet with NaOCl solution. Given the vital appearance of the exposed pulp and to avoid unnecessary RCT, the tampon pulpotomy technique was selected.[3] Freshly mixed CEM cement (BioniqueDent, Tehran, Iran) was precisely pressed against the pulp stumps using gentle mechanical pressure until bleeding ceased and the biomaterial adapted into the pulp chamber (Fig. 1C). The access was immediately restored with a composite resin to ensure coronal sealing (Fig. 1D).

The patient reported rapid symptom resolution within 48 h, and soft-tissue swelling resolved within ten days. Periodontal probing depths progressively normalized (Fig. 1E). At the two-year follow-up, the tooth remained asymptomatic and fully functional. Furcal probing measured 1 mm with no bleeding, indicating full periodontal regeneration (Fig. 1F). Periapical, bitewing, and panoramic radiographs demonstrated complete resolution of the furcal radiolucency, reformation of a normal trabecular pattern, and restoration of periodontal ligament contours (Fig. 1G–I).

This case highlights several clinically relevant points. First, excessive intraoperative bleeding during VPT does not

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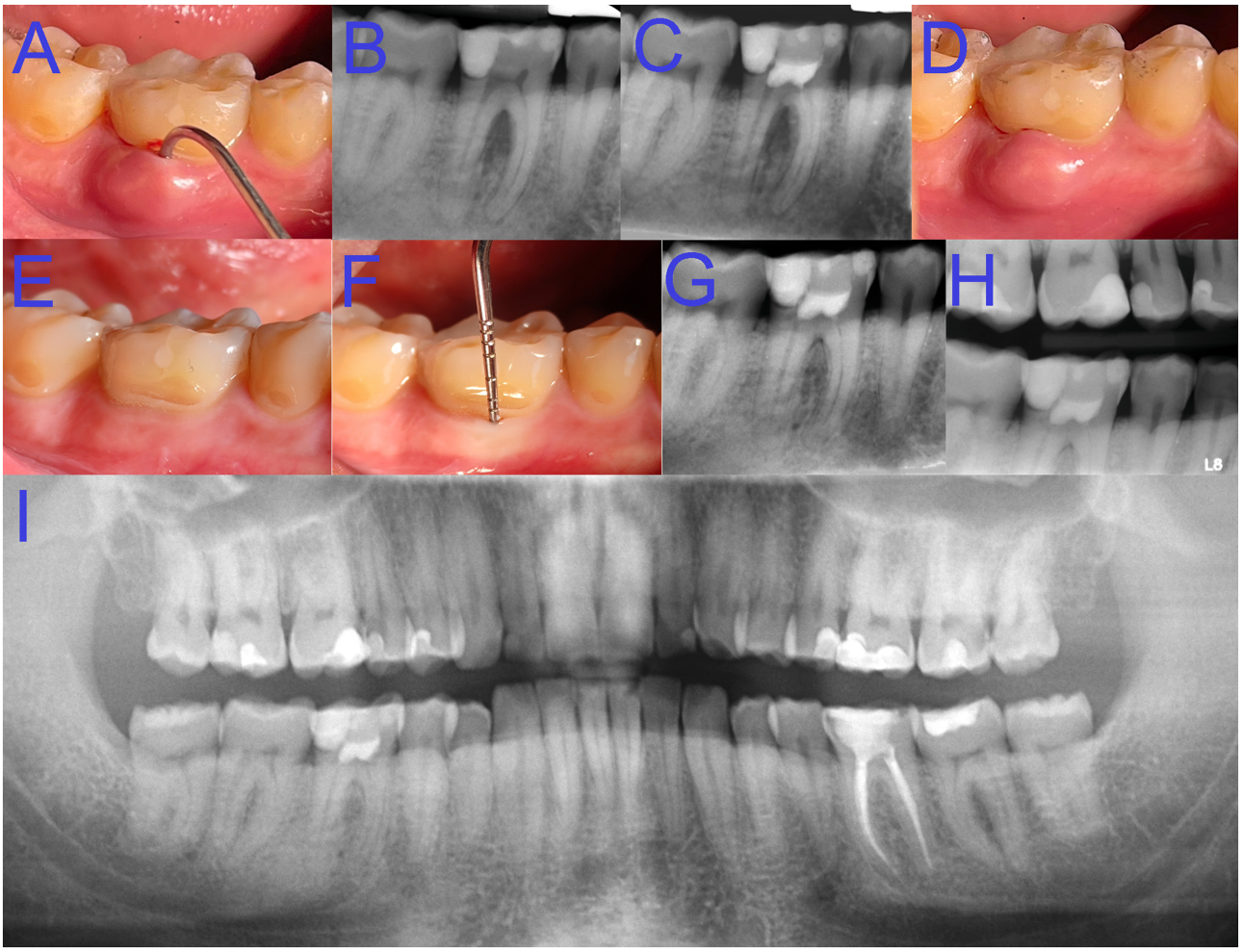

Figure 1 Clinical and radiographic treatment course of the mandibular right first molar. (A) Intraoral photograph demonstrating an isolated deep periodontal probing defect (>7 mm) confined to the furcation area in the absence of generalized periodontal involvement. (B) Preoperative periapical radiograph showing a well-defined furcal radiolucency together with widening of the periodontal ligament space along the mesial root, consistent with a primary endodontic lesion with secondary periodontal involvement. (C) Periapical radiograph showing placement of CEM cement within the pulp chamber (using the tampon technique), achieving immediate hemostasis and coronal sealing. (D) Immediate post-operative photograph demonstrating localized swelling associated with the pre-existing abscess. (E) Clinical photograph at follow-up showing healthy gingival tissues and absence of periodontal defects in the furcation area. (F) Periodontal probing, at the 2-year recall, indicated a physiologic sulcus depth of 1 mm in the furcal region, confirming complete clinical healing. (G) Periapical radiograph, at the 2-year recall, showing complete resolution of the furcal radiolucency, re-establishment of normal trabecular bone pattern, and normalization of the periodontal ligament space. (H) Bitewing radiograph confirming bone regeneration in the furcation. (I) Panoramic radiograph corroborating tooth stability and absence of recurrent periradicular pathology.

necessarily indicate a poor prognosis. On the contrary, it may reflect a well-vascularized pulp capable of healing/regeneration, particularly when inflammation/infection is effectively controlled and an adequate coronal seal is achieved.[4] The tampon technique offers a practical/predictable method for hemostasis when conventional approaches fail, enabling clinicians to preserve vital tissue rather than prematurely converting to RCT in challenging cases.[5] Second, CEM cement's favorable handling characteristics, rapid setting, antibacterial properties, and strong bioactivity make it well-suited for this application and help support stable long-term outcomes. Third, complete healing of a furcal lesion arising from endodontic inflammation suggests that, when radicular pulp vitality is maintained, periradicular/periodontal tissues possess significant regenerative capacity, reinforcing the biological potential of conservative VPTs.

Although a single case, this outcome indicates tampon pulpotomy may be a conservative option for symptomatic mature molars with furcal involvement, but further studies are required to clarify indications and long-term predictability.

Declaration of competing interest

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

Acknowledgments

None.

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