



Localized periodontal defect associated with unusual furcation involvement on a mandibular incisor

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A localized periodontal defect associated with an unusual furcation on a mandibular central incisor and its treatment sequences are presented. A 54-year-old woman presented with a persistent localized periodontal defect, which was not responsive to nonsurgical periodontal therapy. An exploratory surgery revealed complete through and through furcation involvement on the right mandibular central incisor, resulting in a three-walled infrabony defect. Following thorough mechanical debridement and root planing, the infrabony aspect of the defect was grafted with freeze-dried bone allograft combined with the recombinant human platelet-derived growth factor-BB. The flaps were positioned to enable patient's home care and professional dental cleaning. Follow-up examination revealed uneventful healing and resolution of the infrabony periodontal defect. Clinicians should be aware of this unusual condition and consider it as a potential etiology when dealing with a persistent localized periodontal defect in the mandibular anterior sextant, which may not respond to the conventional nonsurgical periodontal therapy. Eliminating the active disease as well as enabling careful maintenance and oral hygiene may prevent further deterioration and result in a stable long-term outcome preserving the compromised tooth. (*Quintessence Int* 2013;44:675–677; doi: 10.3290/j.qi.a30175)

Key words: furcation, guided tissue regeneration, infrabony defect, recombinant human platelet-derived growth factor-BB, tooth anatomy

A tooth with furcation involvement may have a questionable prognosis due to limited access by patient as well as professional care.^{1,2} An important issue when treating a furcation lesion is to provide maintainable soft and hard tissue architectures.³ Early diagnosis and treatment are important to achieve successful and predictable clinical outcomes.³ Furcation involvement usually

appears in periodontally affected molars and to a lesser extent in first maxillary premolars.³ Successful management of localized molar furcation defects has been reported previously.⁴ This case report presents a localized periodontal defect associated with unusual furcation involvement on a mandibular central incisor. A conservative treatment option is also presented.

CASE REPORT

A 54-year-old Caucasian woman presented to the Harvard School of Dental Medicine, Division of Periodontology, and was concerned about the condition of her mandibular incisors. She was systemically healthy without smoking history. Her oral hygiene at the initial visit was fair. Clinical examination revealed severe clinical attachment loss on the mandibular anterior sextant with probing depth of 4 to 7 mm and bleeding on probing. Mandibular anterior teeth had

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Fig 1 A complete through and through furcation was noted on the right mandibular central incisor after root planing and removal of granulation tissue.

Fig 2 Three-walled infrabony defect of 6 mm in depth was noted apical to the furcation.

Fig 3 Infrabony defect was grafted with freeze dried bone allograft that had been hydrated with recombinant human platelet-derived growth factor-BB.

been splinted by her general dentist; however, mild fremitus was noted on all incisors. Radiographic examination revealed severe horizontal alveolar bone loss on the mandibular anterior teeth with vertical bone loss on the mesial and the distal aspects of the mandibular right central incisor. The diagnosis of localized severe chronic periodontitis was made. Cause-related periodontal therapy was initiated, consisting of oral hygiene instruction, scaling and root planing, and delivery of maxillary occlusal guard. The mandibular anterior sextant responded favorably to the initial therapy, with the exception of the mandibular right incisors. Patient's oral hygiene had been markedly improved.

At reevaluation, the option of open flap debridement was discussed and planned. Following complete removal of granulation tissue and root planing, a complete through and through furcation involvement on the mandibular right central incisor (Fig 1) with a 6-mm three-walled infrabony defect was noted (Fig 2). The infrabony aspect of the defect was grafted with freeze-dried mineralized bone allograft particles (Regener-Oss, Biomet 3i) that had been hydrated with recombinant human platelet-derived growth factor-BB (GEM 21S, Osteohealth; Fig 3). The flaps were apically positioned (Fig 4a), exposing the furcation defect supragingivally in order to allow easier access for the patient's home care (Fig 4b). High-fluoride

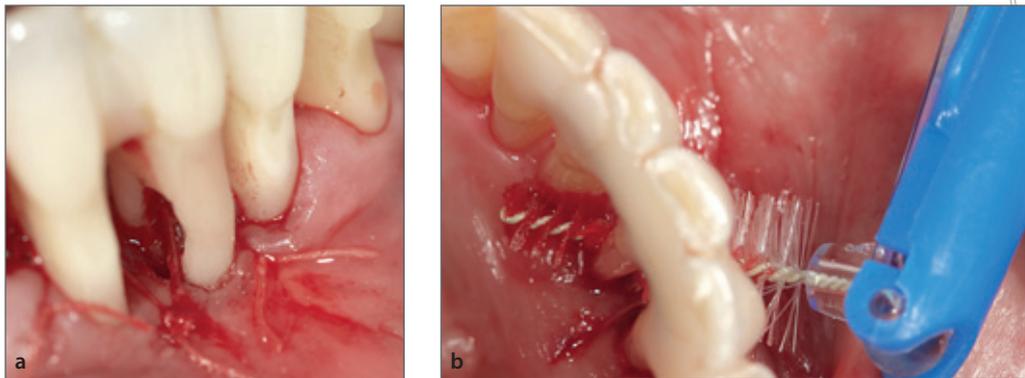
toothpaste was prescribed (Prevident 5000 Plus, Colgate Oral Pharmaceuticals) in order to prevent root caries on the exposed furcation area.

At follow-up, healing was uneventful with no deep probing depth or bleeding on probing. There was no evidence of root caries. The patient's plaque control was excellent. A periapical radiograph revealed resolution of the infrabony defect compared to baseline (Fig 5).

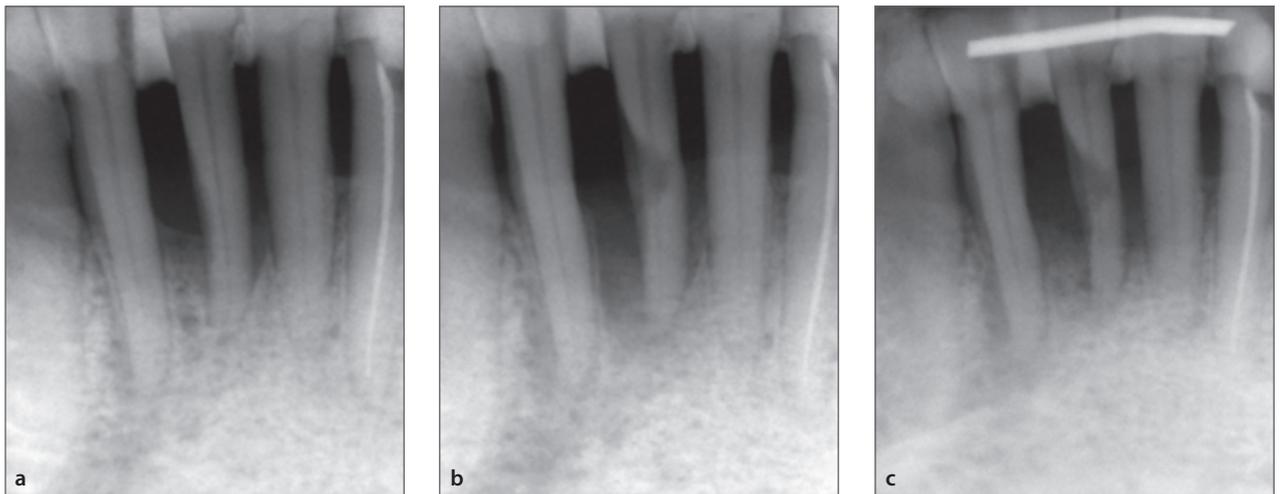
DISCUSSION

Despite the fact that approximately 15% of mandibular incisors were reported to have two canal systems,⁴ this report describes a unique case of complete through and through furcation. The treatment allowed radiographic resolution of infrabony defect and enhanced the access to the furcation area by the patient as well as professional instrumentation. Although the long-term prognosis of the treated tooth could not be determined, the provided treatment might allow for long-term appropriate periodontal maintenance.^{6,7}

Clinicians should be aware of this unique condition and consider it for differential diagnosis when dealing with localized periodontal defects in the mandibular anterior sextant nonresponsive to conventional nonsurgical periodontal therapy. Eliminating



Figs 4a and b Buccal and lingual flaps were repositioned apically in order to expose the furcation area (a) and enable plaque control throughout the furcation (b).



Figs 5a to c Preoperative radiograph (a), intra-operative radiograph after root planing and removal of granulation tissue (b), and postoperative radiograph at 3 months (c). After removal of calculus and granulation tissue, the extent of the furcation defect and associated infrabony defect was evident radiographically. The 3-month follow-up periapical radiograph demonstrated resolution of the infrabony defect around the mandibular right central incisor.

the active disease and enabling good home and professional maintenance might prevent further deterioration and result in a stable long-term solution.

REFERENCES

- McGuire MK, Nunn ME. Prognosis versus actual outcome. III. The effectiveness of clinical parameters in accurately predicting tooth survival. *J Periodontol* 1996;67:666–674.
- Bower RC. Furcation morphology relative to periodontal treatment. Furcation entrance architecture. *J Periodontol* 1979;50:23–27.
- Müller HP, Eger T. Furcation diagnosis. *J Clin Periodontol* 1999;26:485–498.
- Kinaia BM, Steiger J, Neely AL, et al. Treatment of Class II molar furcation involvement: meta-analyses of reentry results. *J Periodontol* 2011;82:413–428.
- Miyashita M, Kasahara E, Yasuda E, et al. Root canal system of the mandibular incisor. *J Endod* 1997;23:479–484.
- Levin L. Ethics in the dental implant era. *Quintessence Int* 2012;43:351.
- Halperin-Sternfeld M, Levin L. Do we really know how to evaluate tooth prognosis? A systematic review and suggested approach. *Quintessence Int* 2013;44:447–456.

