

## CASE REPORT

# Nonsurgical Management of Endodontic Perforation at Molar Furcation Region

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**ABSTRACT**

The periodontal ligament and root canal system have a common developmental, anatomic and functional relationship and theoretically an infection originating in one tissue can affect the other also. The simultaneous existence of endodontic and inflammatory periodontal lesions is a clinician's nightmare as it can complicate the diagnosis and an accurate diagnosis may be particularly difficult when a sinus tract originating from the endodontic lesion drains along the periodontal ligament space, mimicking periodontal disease. Thorough diagnostic testing to confirm pulp necrosis or periodontal disease becomes critical when attempting to diagnose the specific disease entity accurately and then deliver suitable treatment. A blanket diagnosis for any such lesions regardless of primary etiology can prove to be a disaster. A case report of an iatrogenic endodontic perforation of the pulp chamber at the region of molar furcation and managed by nonsurgical therapy is presented in this paper.

**Keywords:** Endoperio lesions, Pulp, Endodontic perforations, Apical periodontitis.

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**INTRODUCTION**

Endodontic lesions occur due to an inflammatory process in the pulpal tissues resulting from noxious agents present in the root canals while periodontal lesions are inflammatory process in the periodontal tissues resulting from accumulation of dental plaque on external tooth surface. The fact that the periodontium is anatomically inter-related with the dental pulp creates pathways for exchange of noxious agents between the two tissue compartments when either or both the tissues are affected.<sup>1</sup> This case report describes an endodontic-periodontal lesion as a result of perforation

from the pulp chamber into the furcation region of a mandibular molar.

**CASE REPORT**

A 14-year-old girl reported to the Dental OPD, with complaints of swelling in the gums of lower left molar for the past 2 days. She gave a history of root canal treatment 1 year back in the same tooth. Initially it was asymptomatic, but for the past 1 week it was giving pain and the swelling appeared 2 days back.

Extraoral examination revealed symmetrical face, there was no swelling or draining sinus but the submandibular lymph nodes were palpable and tender. Intraoral examination revealed an abscess in the buccal aspect of the mandibular left first molar (Tooth No. #36), which was extending from the distal aspect of second premolar (#35) to the mesial aspect of second molar (#37). Probing with a William's probe revealed a pocket depth of 6 mm in the midfacial aspect of #36. The tooth was mobile (Grade I) and tender on percussion. The temporary restoration present on the tooth was removed to clinically visualize the root canal filling, on which, pus started oozing out of the pulp chamber and it was found that the root canal treatment was without obturation.

In the emergency phase of treatment, incision and drainage was carried out through the sulcus and the root canals were thoroughly debrided. An intraoral periapical radiograph was taken with three gutta-percha points in the canals and one in the pocket near the furcation region of #36. The IOPA radiograph revealed perforation of the pulp chamber and bone loss in the periapical as well as in the furcation region (Fig. 1).

Based on the history, clinical features and radiologic findings the case was diagnosed as a primary endodontic lesion of #36 with secondary periodontal involvement.

The patient was prescribed antibiotics (Cap Amoxicillin 500 mg thrice daily for 5 days) and NSAIDs (Tab Ibuprofen 400 mg thrice daily for 3 days). There were no symptoms in the second appointment and in the subsequent appointment the endodontic treatment was completed. The perforation was sealed with calcium hydroxide cement and a Glass Ionomer restoration was given.

The soft tissues regained health and there was no probing pocket depth during review after 1 month. At the end of

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Fig. 1: Preoperative with GP points



Fig. 2: Six months postoperative

6 months, the radiographic examination revealed considerable bone regeneration in the furcation site and in the periapical region (Fig. 2). The tooth was restored with a full coverage metal crown subsequently and the patient is under regular follow-up.

## DISCUSSION

The intimate relationship between the periodontium and pulp can result in interactions occurring between these tissues which may cause or even aggravate an existing lesion and thus presenting the clinician with the challenge of deciding the direct cause of an inflammatory condition of the periodontium.

The three main pathways of communication that allow for the exchange of infectious elements and other irritants between the two are the dentinal tubules, the lateral and accessory canals and the apical foramen. The incidence of accessory canals in the furcation area varies from 23 to 76%.<sup>1</sup> The presence of patent accessory canals is a potential pathway for the spread of microorganisms and their toxic byproducts from the pulp to the periodontal ligament and *vice versa*, resulting in an inflammatory process in the involved tissues.<sup>2</sup>

The endodontic-periodontal lesions can be classified as primary endodontic disease, primary periodontal disease and combined diseases.<sup>3</sup> Endodontic diseases are mainly caused by bacteria.<sup>4</sup> A pulpless tooth with a periapical lesion will promote the initiation of periodontal pocket formation, progression of periodontal disease and interferes with healing of a periodontal lesion after periodontal therapy.<sup>5</sup> The endodontic infection in mandibular molars can cause attachment loss in the furcation regions due to the progression of infection by spreading pathogens through accessory canals and dentinal tubules.<sup>6</sup> The various contributing factors for the development of an endodontic-periodontal lesion is trauma, poor or incomplete endodontic treatment, root resorptions, perforations and dental malformations.

Root perforations are undesirable clinical complications that may affect the periodontal tissues. When perforation occurs, communications between the root canal system and periradicular tissues may often affect the prognosis of treatment. Perforations may result from extensive carious lesions, resorption or during endodontic treatment. Perforations during root canal treatment can cause acute symptoms like periodontal abscess formation associated with pain, swelling, pus exudate, pocket formation and tooth mobility. A chronic response also can exist without pain and involves the sudden appearance of a pocket with bleeding on probing or exudation of pus.<sup>7</sup>

The prognosis of root perforations depends on the size, location, time of diagnosis and treatment, the degree of periodontal damage as well as the sealing ability and biocompatibility of the repair material. The treatment success, especially in case of perforations involving the furcal region depends mainly on immediate sealing of the perforation and appropriate infection control. The materials recommended to seal root perforations are mineral trioxide aggregates (MTA), calcium hydroxide based cements, intermediate restorative materials (IRM), glass ionomer cements, composites and amalgam.<sup>8</sup>

Endodontic therapy should be done first in cases of primary endodontic disease with secondary periodontal involvement and the results should be evaluated in 2 to 3 months and only then periodontal treatment should be considered. This sequence of treatment allows sufficient time for initial tissue healing and better assessment of the periodontal condition.<sup>9</sup>

The prognosis of all combined endodontic-periodontal lesions depends primarily on the severity of periodontal involvement, periodontal treatment, and the response of the periodontal tissues to the treatment.<sup>10</sup>

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