

Case Report

Endodontic Enigma – Mandibular Second Premolar with Three Root Canals: A Case Report

Sanjeev Tyagi, K.P. Arjun Das, S.V. Bhagwat

Department of Conservative Dentistry & Endodontics, People's Dental Academy, Bhanpur, Bhopal-462010 (M.P.)

Abstract:

Location and thorough instrumentation of all the canals in the root of a diseased tooth normally ensure success of the endodontic therapy. Present case was referred for endodontic therapy of mandibular second premolar. Clinical and radiographic examination revealed inadequate root canal filling. Three canals were located. Endodontic therapy was performed under aseptic conditions.

Key Words: Pre-molar, Three root canals, Re-root canal treatment.

Introduction:

Detailed knowledge of root canal anatomy and awareness of the configuration of the pulp canal are essential when practicing root canal therapy. There are evidences that root canal morphology is almost limitless in its variability. The unusual number of canals should always be expected in various teeth. Untreated root canals may cause failure of the treatment.

Mandibular second premolars are known to have a single canal. According to El-Deeb (1982) the mandibular premolars may show wide variation in their root canal anatomy. The incidence of their having two or three canals was reported to vary from 0 to 34.3%. (Zillich & Dowasn ,1973; Vertucci, 1978; Yang et al, 1988).

Case reports describing four canals in mandibular second premolar have been occasionally published (Yang et al, 1988; Wong, 1991). Thus, the knowledge & recognition of atypical anatomy is important even though it is not usually encountered.

The aim of this article is to report an uncommon condition of mandibular second premolar with three distinct canals.

Case report:

A 28 years old female with severe pain in right mandibular region was referred to the Department

of Conservative Dentistry and Endodontics for evaluation of root canal therapy. Clinical examination revealed that the mandibular second premolar tooth responded positively to percussion but not to palpation. Radiographic examination revealed short and inadequate root canal filling. (Fig. 1).



Fig. 1: Pre-operative radiograph showing the poor root canal filling.

The tooth was isolated with rubber dam, the old amalgam filling was removed and the access cavity preparation was re-established. The gutta-percha was removed using Hedstrom file size 15 without solvent. Three canals were located : buccally, lingually and an extra canal in the middle. The working length was checked radiographically (Fig. 2).

The canals were conventionally instrumented with a # 35K file using crown-down pressureless

Correspondence Author: Sanjeev Tyagi , Associate Professor,
Department of Conservative Dentistry & Endodontics, People's Dental
Academy, Bhanpur, Bhopal-462010 (M.P.)
Phone: +91-9893456642
E-mail: drtyagis@gmail.com



Fig. II : Working length radiograph showing files in the three root canals.

technique. Canal was irrigated with 5.25% sodium hypochlorite, dried with sterile paper points and sealed with formacresol. The access opening was closed with Cavit. Antibiotics along with analgesics and anti-inflammatory drugs were prescribed for 3 days.

The patient returned asymptomatic after 3 days. Tooth was isolated with rubber dam, the canals were instrumented with # 35 K file and irrigated with sodium hypochlorite and saline. Patient was recalled after 4 days. On fifth day, tooth was irrigated with sodium hypochlorite and saline to remove all the remnants of the formacresol and then dried with paper points. Master cone was selected and the canals were filled with gutta percha and AH26 sealer cement using lateral condensation. Access opening was sealed with amalgam restoration. Post-operative radiograph was taken to confirm the quality of the filling (Fig. 3). The patient was referred to the prosthetic clinic for crown construction.



Fig. III : Obturation of the three root canals.

Patient was asked to come for follow up after one month. At the end of one month she conveyed that she was unable to come for follow up but that she was asymptomatic.

Discussion:

Inadequate debridement and/or incomplete obturation of the root canals were found to be the commonest cause of root canal therapy failures (Grossman, 1972). If a canal is originally cleaned but incompletely filled, tissue fluids from the adjacent area could cause chronic inflammatory response in the periradicular tissue (Seltzer et al, 1967).

In this case three canals were identified, out of which only one was filled inadequately. Short canal fillings usually offer no serious problem in retreatment. That is why a Hedstrom file was used without solvent. If a canal is inadequately filled, it is generally due to insufficient canal preparation. In a study of endodontic failures, from histology perspective, Seltzer et al (1967) reported inflamed or necrotic pulp tissue in teeth in which endodontic therapy had failed. They found tissues in canals that were not instrumented during treatment.

Although the success rate of retreatment of failed therapy is high, it may be lower than that for initial endodontic therapy (Sjogren et al, 1990). Non-surgical retreatment is always preferable and should be attempted before resorting to surgery. The objective of retreatment is to perform endodontic therapy in order to return the treated tooth to function and comfort, and to allow the supporting structures to heal completely. Retreatment of the present case was performed using the crown-down pressureless technique. It has been advocated by Marshall & Pappin (1980) in which Gates Glidden drills and large size files should first be used in the coronal two thirds of the canal and then smaller files are progressively used from the crown-down until the desired length is reached. This technique has the advantage of enlarging and cleaning the coronal area before proceeding deeply into the apical regions from where majority of the infected tissue is removed (Marshall & Pappin, 1980; Saunders & Saunders, 1992). Furthermore, it provides unobstructed access for instruments to follow. This would help to minimize post-operative discomfort by preventing the inoculation of periradicular tissues with bacteria and necrotic tissue that might be pushed out by hand files.

A thorough knowledge of the pulp space morphology is essential for successful endodontic therapy. This may help to reduce endodontic failure caused by incomplete obturation. An extra root canal may be detected by careful clinical and radiographic investigation of the floor of the pulp chamber. (Zillich & Dowsan, 1973). Finally, variations in root canal morphology must be considered before starting the root canal therapy.

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