

ENDODONTIC MANAGEMENT OF SEVERELY CURVED ROOT CANAL :” NEGOTIATING THE CURVES”

INTRODUCTION

The curved and dilacerated roots in the posterior teeth often present the major challenge to the clinicians during the endodontic treatments. Dilaceration is the result of a developmental anomaly in which there is an abrupt change in the axial inclination between the crown and the root of a tooth. Dilaceration can be seen in both the permanent and deciduous dentitions, and is more commonly found in posterior teeth and in maxilla. The common causes of endodontic treatment failure in such cases of canal anatomies are due to procedural errors such as ledge formation, fractured instruments, blockage of the canal, zipping, or elbow creation. Periapical radiographs are the most appropriate way to diagnose the presence of root dilacerations. The controlled regularly tapered preparation of the curved canals

is the ultimate challenge in endodontics. This current case report presents the endodontic management of dilacerated mandibular premolar .

CASE REPORT

A 29-year-old female patient reported to the Department of conservative dentistry and endodontics with the chief complaint of severe and continuous pain in the mandibular right teeth region for 5 months. The patient gave a history of severe pain while lying down on the bed and while sleeping and the pain relieved only for few hours after taking the analgesics. No significant medical history was observed. The intraoral clinical examination revealed a restored tooth in relation to #45 associated with tenderness on percussion. The IOPA revealed a radiolucency below the restoration extending into the pulpal region with no signs of periapical pathosis(fig 1).

With informed consent, local anesthesia was administered using 2% lignocaine and 1:200,000 Adrenaline and Endodontic therapy was started under rubber dam isolation. Pre-existing restoration was removed and the endodontic access cavity was prepared using Endo access bur # 2 (Dentsply Maillefer).

Working length was determined by electronic apex locator and confirmed by radiograph (fig 2). All the hand files were introduced which maintains the instrument centrally in the canal. Special attention was given on frequent irrigation of the root canal and recapitulation. Final cleaning and shaping were carried out using Neoendo rotary files up to 6% 25 size of the instrument. Calcium hydroxide was used as an intracanal medicament. In the second visit, the canals were irrigated and obturated using 25-6% Gutta percha (fig 3&4). The post-endodontic restoration was done.

DISCUSSION

Successful endodontic treatment involves thorough cleaning and shaping of the canals, most of the canals have multiple curvatures along their length, which pose difficulty in root canal instrumentation. Canal curvature can be a dilacerated canal, S-shaped canal, gradual curvature of the root, and sharp curvature in the apical third. Dilaceration was termed by Tomes and defined as a deviation in the linear relationship of a crown of a tooth to its root. The etiology of dilacerations are trauma to permanent tooth bud or idiopathic developmental disturbance. The most desirable shape of the prepared canal is a progressive taper with the largest diameter at the coronal end and is narrowest at the apical constriction. A progressive taper allows a greater degree of instrument and irrigant contact with the

surfaces of the canal walls, thereby enhancing the effectiveness of cleaning.

Mid-canal curvatures are relatively difficult to handle, especially if the coronal third of the root is straight and if this is not adequately dealt with, it may lead to iatrogenic errors such as file separation, perforations, ledge formation, and blockage of canals decreasing the prognosis of the tooth. Preoperative assessment and the usage of correct instrumental technique are highly recommended. The two steps for better management of mid-root curvature are adequate access and good coronal third preparation. This will ensure greater volume of irrigant to reach the mid-portion of the canal and allow instrumentation without any restriction and thus, create an ideal platform for the preparation of mid-root curvature. Once the coronal third portion of the canal is prepared, the mid-portion is prepared

using precurved files. The bend given on the file should be gentle as sharp acute bends increase the probability of file fracture. The precurved file helps in negotiating the canal and makes a glide path before rotary NiTi files are introduced for cleaning and shaping and reduce procedural mishaps

Angle of canal curvature	Incidence of ledge formation (%)
Straight canal (<5°)	12.5
Moderately curved canal (<20°)	49.5
Severely curved canal (<20°)	52.3

RELATIONSHIP BETWEEN THE DEGREE OF CURVATURE AND
INCIDENCE OF LEDGE FORMATION

All hand files are used with balanced force technique which has advantages of less extrusion of debris, less iatrogenic errors and maintenance of instrument centrally. Usage of rotary files in crown down technique helps in early flaring of coronal third and has advantages such as reduced coronal binding of the

instruments, less apical extrusion of debris, and effective irrigation of apical third of the root canal.

CONCLUSION

To address challenging mid root curvatures, it is essential to remain patient, first negotiate canals by hand and consider using rotary files in a crown down manner with copious irrigation between each file.

Appropriate instrumentation techniques and customized treatment planning will help manage curved canals, prevent complications, and enhance the quality of the treatment.



Fig 1: PRE-OPERATIVE RADIOGRAPH



Fig 2: WORKING LENGTH

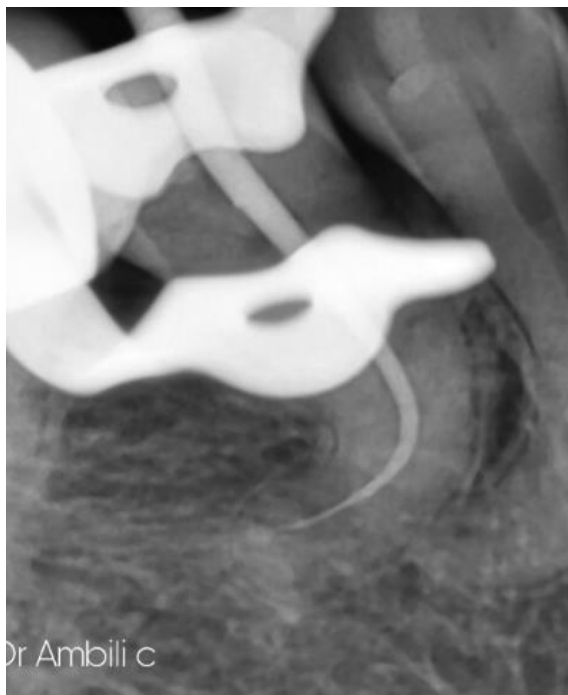


Fig 3: MASTER CONE



Fig 4: OBTURATION

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I / We certify that I/we have participated sufficiently in the intellectual content, conception and design of this work or the analysis and interpretation of the writing of the manuscript, to take public responsibility for it and have agreed to have my/our name listed as a contributor. I/we certify that all the data collected during the study is presented in this manuscript and no data from the case report has been or will be published by the editors, I/we will provide the data/information or will cooperate fully in obtaining and providing the data/information on which the manuscript is based, their assignees.

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