

Management of Calcified Root Canal: A Case Report

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Abstract

Background: Calcification of root (calcific metamorphosis) is usually seen as defensive reaction of pulp to trauma. Intensity of trauma/hit, time span since trauma, pulp response to trauma are multiple factors deciding degree of calcification. Calcification may be seen partially or entirely in root canal. Usually calcified teeth remain asymptomatic, but when a tooth becomes symptomatic endodontic treatment needs to be done. Treatment of calcified canal is a challenge to the dentist.

Case report: A female patient reported to the department of conservative dentistry and endodontics at Sharad Pawar Dental College with chief complaint of pain in upper front region of jaw. On radiographic examination calcified root canal was associated with upper anterior teeth. Root canal treatment was planned for calcified tooth. Access opening was carried out using BR45. To achieve patency within canal file #8, 10 were used, but initially patency could not be achieved due to calcified canal. With help of chelating agents 17% EDTA liquid and gel and small size K file #8, 10 canal negotiation was carried out to achieve patency. Working length was then determined and canal was instrumented. NaOCl, EDTA was used as intermittent irrigant. Final rinse was done using 2% CHX. Canal was obturated using cold lateral condensation technique followed by permanent restoration. Entire procedure was carried out under magnification.

Conclusion: Calcified canal treatment is a bit tedious than routine endodontic procedure. But it can be managed if procedure is carried out under proper illumination, magnification, CBCT, understanding root canal anatomy, use of dye, modified access bur, files, chelating agent, irrigants and irrigation activation system.

Keywords: Calcified canal, Negotiation, Glide-path, chelators.

Introduction

Goal of endodontic treatment is to completely eradicate micro-organisms and disinfect root canal. This is obtained by biomechanical preparation, use of irrigants, intracanal medicament. It is difficult to access complex root anatomy, calcified canal for complete disinfection. Calcification of root (calcific metamorphosis) is usually seen as defensive reaction of body to trauma. Intensity of trauma/hit, time span since

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trauma occurred, body's response are multiple factor deciding degree of calcification.⁽¹⁾ Calcification may be seen partially or entirely in root canal. Locating root canal in such teeth is a tedious job. As there are chances of perforation, excessive dentin removal. Present case report enlighten about endodontic management of calcified canal in upper central incisor.

Management: Local anesthesia was administered "2% lignocaine with 1:80,000 epinephrine".⁽²⁾ Access preparation was done with high speed round bur (BR 45) and modified using EX24 bur. No canal orifice was visible upon access opening initially. On probing catch was present more towards lingually. File. No. 6 K file was inserted to confirm the opening of canal. File was in canal but not upto working length. File was 5 mm short of working length due to calcification of canal. No. 6 K file got bind at middle third of root. so to negotiate the canal till apex, filling with file # 6 along with use of chelator 17% EDTA gel and EDTA liquid was done. Same procedure was done in canal to create glidepath with No. 8 & 10 K Files & Path Files. working length was recorded using apex locator and confirmed on PSPIx, WL- 17mm .Complete Chemo-Mechanical Preparation was done using Step - back technique by hand K-files upto 80 No. K file, Master apical file was 55 No. k file. 3.5% sodium hypochlorite (Prime dental) and saline was used for irrigation during RCT. Final rinse by 17% EDTA (Prime Dental) followed by 2% CHX (Neelkanth). Master cone fit was taken. Sealapex sealer was coated in canal using lentulospiral and obturated using cold lateral condensation technique.^(3,4,5,6) Post endodontic restoration using GIC (Fuji II) was done.^(7,8)

Discussion

Mechanism behind canal calcification is not clear. It is believed when trauma occurs it leads to disruption of blood vessel. Clot formation occurs which acts as source for calcification in root canal. 4 - 24% teeth show varying degree of calcification due to trauma. Radiographically loss of pulpal space, discoloration of teeth is suggestive of calcification in teeth. ⁽⁹⁾ If such teeth is symptomatic treatment of following tooth come into high difficulty class according to "American Association of Endodontists Case Assessment criteria".⁽¹⁰⁾ Pulp chamber and root canal is usually shifted more towards lingually in calcification of upper

anterior teeth. Access cavity preparation should be made such that excessive loss of dentin is avoided.⁽¹¹⁾ Law of color change, i.e pulp chamber will be more darker compared to root dentin. This will help to identify entry in pulp chamber. ⁽¹²⁾Use of CBCT, dental operating microscope for treatment of calcified canal is boon. ultrasonic tips to negotiate calcified root canal, use of bur with long shank are used for troughing and to locate calcified canal. Detection of orifice by use of methylene blue dye or champagne bubble test under microscope are useful to locate canal orifice. ⁽¹³⁾Multiple angulated radiograph should be taken in deep access preparation to ensure central alignment and no loss of excessive dentin or perforation. ⁽¹⁴⁾Negotiation of calcified canal, narrow constricted canal is a challenge toward dentist. Usually negotiation is done with use of file #6,8,10 which has small diameter therefore used as pathfinder files. Due to small diameter these files lack rigidity and may fracture if excessive watch winding force is applied. So to prevent fracture of this file and further complication alternate use of file # 6,8,10 should be done.^(15,16) Gentle watch winding motion to file with slight push pull motion should be used. Files should be checked before insertion and discarded when sign of distortion appears. Many different file system for negotiation of calcified canal have been introduced. Such file has quadrangular cross section to increase rigidity of file to prevent its breakage.⁽¹⁷⁾ Decalcifying, chelating agents and irrigants should be used during biomechanical preparation to soften canal dentin and facilitate passage of filelike 17 % EDTA gel, 17% EDTA irrigant .⁽¹⁸⁾ Calcification usually occurs from corona to apical direction. Therefore if file is negotiated well at coronal and middle third, instrumentation in apical third becomes easier.⁽¹⁹⁾ Schindler & Gullickson stated if negotiation of canal is not achieved and tooth is symptomatic. root end resection under microscope should be treatment of choice.^(20,21,22)

Conclusion

Prognosis, success of root canal treatment rely on complete disinfection till apex. In case of calcified canal to achieve negotiation use of various file system, irrigants, chelating agents, modified bur and procedure under dental operating microscope renders successful treatment of calcified tooth.

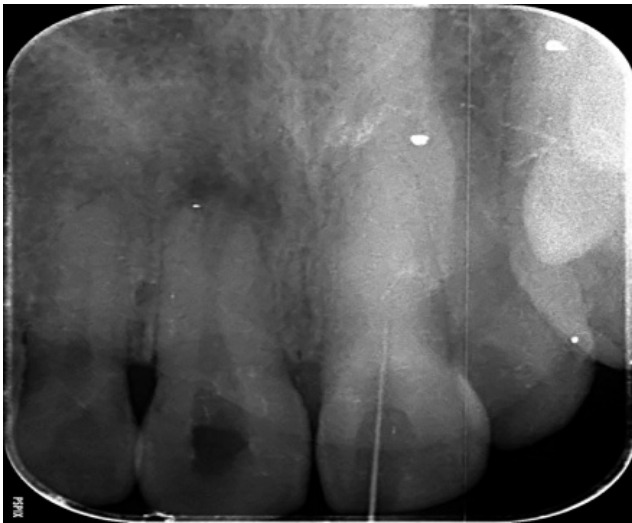


Fig 1- File #8 Short of apex 6-7mm



Fig 4- GP fit with 21

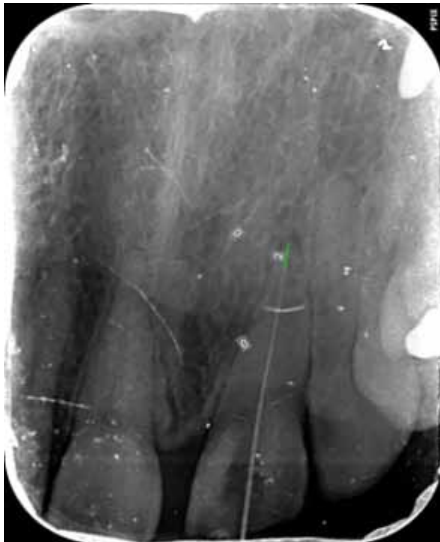


Fig 2- File #8 short of apex 2mm



Fig 5- Obturation with 21



Fig 3- File #8 negotiated till apex

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