Proceeding

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Non-Surgery Treatment For Periapical Lesion On Tooth 21 And 22 With Conventional Endodontic Technique

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ABSTRACT

Pulp defense system towards prolonged bacterial infection can cause pulp necrosis and periapical lesion. Periapical lesion often occur without acute pain and can be detected on radiographic examination. Incidence of periapical lesion showed 6-55% are cysts, 9.3-87.1% are periapical granulomas, and 28.7-70.07% are abscesses. Research reported success rate up to 85% conventional endodontic treatment of teeth with periapical lesion, therefore conventional treatment is most preferred on periapical lesion cases. Calcium hydroxide is common used as intra-canal medicament owing to its effective antimicrobial formulations. A 22 year old female patient came with chief complaint was unaesthetic composite restoration on maxillary anterior left tooth. The patient felt swelling on palate and upper gingiva. Clinical examination showed discolored composite restoration on distal tooth 21 and mesial tooth 22. Radiographic examination showed radiolucent involving tooth 21 and 22. Treatment done first with access opening and working length determination. Tooth 21 was prepared by crown down technique using ProTaper handuse, while tooth 22 was prepared by conventional technique using K-file. Intra-canal medicament used was calcium hydroxide. The post-operative radiographic examination showed good progression of periapical lesion, hard-tissue healing, and decreased radiolucency on radiographic examination. Conventional treatment for periapical lesion showed high success rate. Conventional treatment should be the first consideration prior to surgery approach. Calcium hydroxide was used as intra-canal medicaments and showed a significant result because of its antimicrobial formulation.

Keywords : periapical lesion, conventional endodontic, calcium hydroxide

INTRODUCTION

Periapical lesion is a sequence of healthy pulp changes due to failure of pulpal defense system towards bacterial invasion. A prolonged and untreated pulp inflammation will easily lead to pulp necrosis. Pulp defense system has a several ways to withstand the bacterial infection and periapical lesion is an outcome of the process. Incidence of periapical lesion showed 6-55% are cysts, 9.3-87.1% are periapical granulomas, and 28.7-70.07% are abscesses. Treatment for periapical lesion may vary from non-surgery to surgery approach. Non-surgery treatment for periapical lesion reach survival rate 85%. This high survival rate makes non-surgery approach should be considered prior to surgery approach. The purpose of this case report is to report the periapical lesion significant progression treated with conventional endodontic approach.

CASE REPORT

A 23 year-old male came to Conservative Department Faculty Dentistry of Universitas Padjadjaran with her chief complaints were her old composite restoration on upper left anterior teeth and she felt a swelling on her palate. On November 2015, the patient felt severe pain accompanied by fever. She sensed the swelling on the palate was more firm after she ate or drink cold food or beverages. Patient recalled no trauma history. And she undergone orthodontic treatment from 2011 until 2013. Patient came to our department demanding a treatment.

Extraoral examination showed facial symmetry. There is no abnormalities found on lips and temporomandibular joint. Lymph nodes examination showed no swelling or pain. Clinical examination showed an average oral hygiene. A swelling reddish lump found on the anterior palate which approximately sized 4 mm. The consistency was soft and immobile. There was an old and discolored composite restoration on distal tooth 21 and mesial tooth 22 which suspected expand onto palatal area. Objective examination on tooth 21 showed

Figure 1. Pre-operative clinical situation of the patient.

Figure 2. Radiographic examination showed periapical lesion on tooth 21 and 22.

positive vitality tests, tender to percussion, negative pressure test, positive palpation test around palatal area, and negative mobility test. Examination on tooth 22 showed negative vitality test, no response to percussion, negative pressure test, negative palpation test, and negative mobility test.

CASE MANAGEMENT

The diagnosis determined for tooth 21 and 22 were chronic apical abscess. The treatment plan was conventional endodontic treatment for both of the tooth. On the first visit (April 1st 2016), patient was notified about the treatment and the outcome desired. After the patient agreed and understood about all the consequences of the treatment, patient signed informed consent. The treatment began by isolating oral cavity with rubber dam. The access opening were done by #2 round diamond bur and the cavity wall were smoothened with Endo-Z bur.

Root canal preparation of tooth 21 was done by ProTaper Universal Handuse. First step done was using Sx file to enlarge two-third coronal part. Then glide path was negotiated using small sized K-file #15 to #20. Working length determination was done with electronic apex locator and the result was 25 mm. Crown down preparation was continued with shaping file S1 then S2. A copious 2.5% sodium hypochlorite was delivered combined by repeated recapitulation to maintain working length. After using of shaping file, the preparation was continued with finishing file F1 and ended with F4. Preparation completed by last recapitulation and irrigation combination (2.5% sodium hypochlorite, distilled water, and 2% chlorhexidine).

Root canal preparation of tooth 22 was done by standard technique. First step performed was working length determination which was done by electronic apex locator and K-file #10. Straight line access was acquired but the working length remained vague. K-file then pre-bended and the glide path obtained was curved to palatal on apical third. The preparation was continued with standard technique until K-file #45. Between file exchanged, a copious 2.5% sodium hypochlorite was delivered. Watch-winding movement was used to

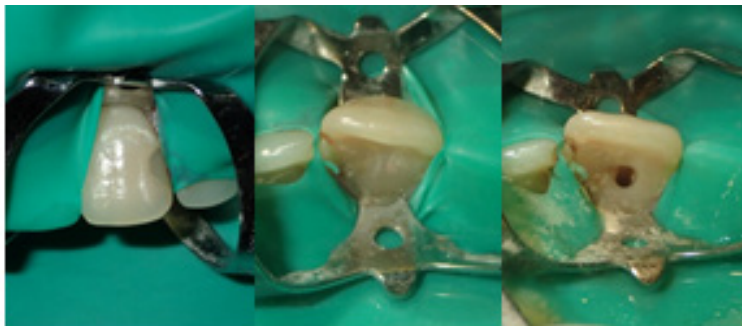

Figure 3. Access opening on tooth 21.

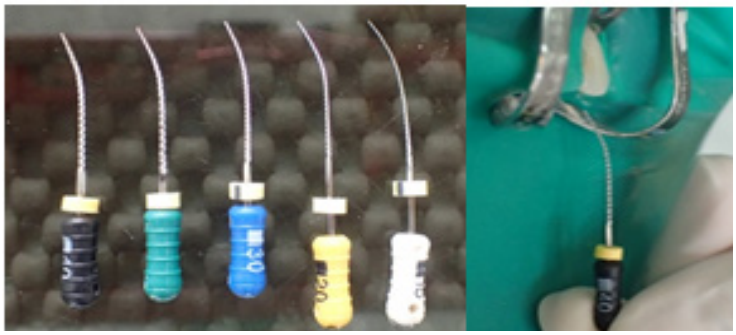

Figure 4. Pre-curved K-file to maintain the natural shape of root canal 22 which is curved to palatal on apical third.

Figure 5. (a) and (b). Caries removal. (c) old composite replacement.

prepare the curved canal. Last was recapitulation using K-file #10 and rinsed with distilled water combined with 2% chlorhexidine. Intracanal medicament used in this case was calcium hydroxide. The cavity was blocked with cotton pellet and temporary restoration material Cavit.

Second visit was conducted on April 2016, the patient came with no complaints but the tooth still tender to percussion. Rubber dam was applied and Cavit was opened. Root canal still filled with calcium hydroxide and the consistency were watery at two-third coronal also at one-third apical. The root canal then rinsed with irrigation combination and then dried

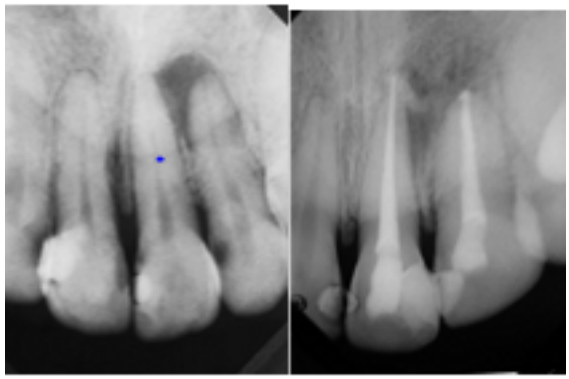

Figure 6. A pre-operative and post-operative radiograph of the patient.

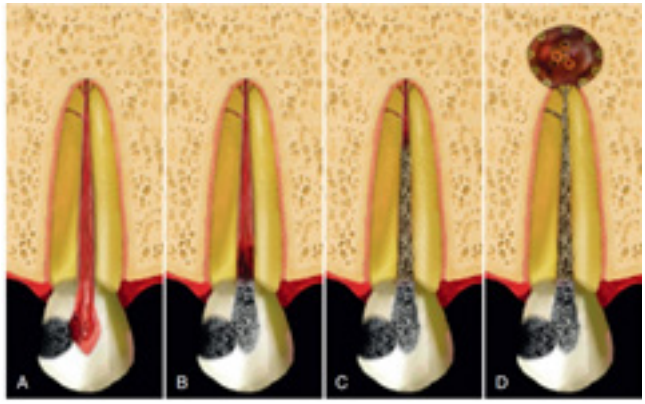

Figure 7. A dynamic process from healthy pulp defense system to a forming of periapical lesion.

with paper point. Calcium hydroxide again used as an intracanal medicament. The cavity then blocked with cotton pellet and Cavit.

Third visit, tooth 21 and 22 still tender to percussion and the consistency of calcium hydroxide still watery. The old composite showed darken color and worsen condition on proximal and marginal area. Secondary caries was discovered underneath the composite restoration. The caries was removed and the old composite was replaced at that time. Another intracanal medicament replacement procedure was done and the cavity again blocked with cotton pellet and Cavit.

Forth visit, patient showed no more sensitivity to percussion and there is no complaint. Rubber dam was applied and root canal was cleansed. Calcium hydroxide found inside the root canal was dry in the coronal part and even in the apical. Root canal then rinsed, dried, and trial radiography was taken. The result showed significant progression of the lesion. The patient has to leave at that time so the obturation was canceled. Root canal was filled with calcium hydroxide and compacted with cotton pellet and Cavit.

Fifth visit the patient came and the root canal was prepared for obturation. Rubber dam was applied and the root canal was irrigated with abundant 2.5% sodium hypochlorite, distilled water, and 2% chlorhexidine. Master gutta percha prepared for tooth 21 was ProTaper gutta percha size F4 and for tooth 22 was ISO size #45. Endomethasone was manipulated for the sealer and lateral condensation technique was used for both of these teeth. An unfilled space detected which was finger spreader then loaded with accessory gutta percha #15. Orifice then packed with glass ionomer cement and Cavit. Patient then instructed to have radiography examination. The final radiograph showed a compact obturation and a significant progression of the lesion.

DISCUSSION

Pulp necrosis is a sequence occurred from pulpal defense system toward bacterial invasion. In this patient, the etiology of pulp necrosis can be vary. Initial clinical examination that showed fail composite restoration which is discolored on distal tooth 21 and mesial tooth 22. When the old composite removed, secondary caries can be observed underneath and around cervical areas. Bacteria penetration can enter pulp chamber through many routes. Pulp exposure toward bacteria may happen when the restoration procedure is done such as bacteria from biofilm, calculus, caries, rubber dam leakage, and from contaminated instruments. And bacteria penetration after the restoration performed may happen from the infamous composite weakness shrinkage, overhang contour in proximal area, and bad oral hygiene. Patient complained a swelling on anterior part of palatal. Swelling has to be palpated to distinguish the consistency whether solid or fluctuant. This patient has a reddish and soft swelling that indicate an abscess. With that diagnosis, the treatment plan was conventional endodontic treatment which is a non-surgery approach.

Root canal preparation for tooth 21 was done by crown down technique with ProTaper handuse instruments while for tooth 22 was done by standard technique using K-file. Tooth 22 root canal discovered had a curve at apical third to palatal direction. A natural shape of curved canal should be preserved and it can never be straightened. Straightening root canal can lead to an apical foramen transportation which cause failure of root canal preparation such as ledge. A way to conserve natural shape of curved root canal is to use small K-file size #1o to maintain a reproducible glide path and canal has to be filled with irrigant. In this patient, the preparation was done by maintaining curved shape canal by pre-bending each K-file and using watch-winding movement. Watch-winding movement is done by moving the file 30^0-90^0 clockwise to penetrate the file apically. Then the file moved reciprocally to put the file more apically and counterclockwise to cut the wedged dentinal wall. A 3 to 5 stroke will loosen the file and permit the file prepare more apically. This movement is done with gentle pressure and it is suitable for negotiating glide path or conserving curved canal.

Mechanical instrumentation and chemical irrigation reported only remove 50% to 80% of all bacteria amount inside root canal. One of the way to advance bacterial removal is intracanal medicament between dental scheduled time. Calcium hydroxide is already an

accepted medicament due to its advantages in releasing calcium and hydroxyl ion which lead to superb antimicrobial properties. Calcium hydroxide has a consistency that can be intact inside root canal for weeks or months and it can survive the dissolution caused by dentinal fluid. Moreover, calcium hydroxide is a high alkaline substances that exterminate bacteria through protein membrane denaturation and DNA breakage. For the obturation, endomethasone was chosen as a sealer material. Endomethasone is a zinc-oxide eugeunol based which has antimicrobial properties, in particular studies reported it is effective towards *Enterococcus faecalis* even 7 days after mixing. It is reported that endomethasone can penetrate into dentine tubulus 250μm deep.

Surgery approach is indicative for treating periapical lesion. Among periapical cases, there were found 6-55% cases were cyst, 9.3%-87.1% were periapical granulomas, and 28.7%-70.07% were abscess. The success rate of non-surgical treatment for periapical lesion is 85%. This high number demand clinician to perform conventional technique prior to considering endodontic surgery.

CONCLUSION

Non-surgery approach has to be considered and attempt prior to surgery decision. This case showed a successful periapical lesion with conventional endodontic which can be seen radiographically that the healing process was occurred.

REFERENCES

1. Hargreaves K, Berman L. Cohen's Pathway of the Pulp. 11th ed. Hargreaves K, Berman L, editors. Elsevier; 2016.
2. Bergenholtz G, Hörsted-Bindslev P, Reit C. Textbook of endodontology. John Wiley & Sons; 2013.
3. Castellucci A. Endodontics, Volume 2 [Internet]. Il Tridente; 2005. (Endodontics). Available from: https://books.google.co.id/books?id=8VFQAQAAIAAJ
4. Mohammadi Z, Shalavi S, Yazdizadeh M. Antimicrobial activity of calcium hydroxide in endodontics: a review. Chonnam Med J [Internet]. 2012;48(3):133–40. Available from: http://synapse.koreamed.org/DOIx.php?id=10.4068/cmj.2012.48.3.133
5. Ordinola-Zapata R, Bramante CM, García-godoy F, Moldauer BI, Minotti PG, Tercília Grizzo L, et al. The effect of radiopacifiers agents on pH, calcium release, radiopacity, and antimicrobial properties of different calcium hydroxide dressings. Microsc Res Tech. 2015;78(7):620–5.
6. Mohammadi Z, Dummer PMH. Properties and applications of calcium hydroxide in endodontics and dental traumatology. Int Endod J. 2011;44(8):697–730.
7. Dentistry MSC. Antimicrobial Efficacy of Endomethasone and Sealapex Sealers against Specific Endodontic Pathogens. 2013;(2):2013.
8. Torabinejad M, Walton RE. Endodontics: principles and practice. Elsevier Health

Sciences; 2009.
9. Dixit S, Dixit A, Kumar P. Nonsurgical treatment of two periapical lesions with calcium hydroxide using two different vehicles. Case Rep Dent [Internet]. 2014;2014:901497. Available from: http://www.pubmedcentral.nih.gov/articlerender.fcgi?artid=4123525&tool=pmcentrez&rendertype=abstract
10. Venugopal P, Kumar A, Jyothi K. Successfull Healing of Periapical Lesions With Non-Surgical Endodontic Approach. J Dent Sci Res. 2011;2(1):1–6.