

Case Report

Non-surgical management of periapical lesions with triple antibiotic paste: A case reports

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ABSTRACT

Sterilization of root canal space is foremost for the success of the endodontic treatment which is usually carried out with intracanal irrigants and medicaments. Triple antibiotic paste (metronidazole, ciprofloxacin, and minocycline) is used to achieve sterilization and healing of periradicular area. In the present case report, the triple antibiotic paste was used for non-surgical management of periapical lesion for 3 weeks. After 3 weeks, the tooth became asymptomatic that was then obturated. Hence, it is confirmed that conventional root canal treatment, along with intracanal medicaments (triple antibiotic paste), can non-surgically manage the periapical lesions and further promotes healing.

Keywords: Metronidazole, Ciprofloxacin and minocycline, Triple antibiotic paste, Periapical lesion

INTRODUCTION

Elimination of the microorganisms, in the case of large periapical lesions, has been a challenge for the clinician. The polymicrobial infection makes sterilization of the root canal system difficult. It results in failure of root canal treatment as the canal has not been adequately cleaned off intraradicular burden, thus leads to persistent infections.^[1] According to *in vivo* and *in vitro* studies, the use of antimicrobial medicaments in combination with mechanical cleansing enhances the success of treatment in the achievement of sterilization and healing of infected root dentin.^[2] The Cardiology Research Unit of the Niigata University has developed the concept of “Lesion sterilization and tissue repair LSTR” therapy that employs the use of a combination of antibacterial drugs (metronidazole, ciprofloxacin, and minocycline) for the disinfection of oral infectious lesions, including dentinal, pulpal, and periradicular lesions.^[3]

In this article, the treatment of cases with periapical lesion by triple antibiotic paste has been presented.

CASE 1

A 35-year-old female was referred to the Department of Conservative Dentistry and Endodontics of Adesh Institute of Dental Sciences and Research due to swelling in her right lower region. Her medical status was non-contributory. She had a history of pain in the lower right side 1

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month back. On extraoral examination, there was a swelling in the right area of the mandible. Tooth 45 had occlusal caries, which was slightly tender to percussion with probing and exhibited normal mobility. The electronic pulp test was negative. An intraoral radiograph [Figure 1] was done and showed pulpal exposure of the concerned tooth. At the same appointment, the root canal treatment was initiated, after placement of rubber dam, access cavity was done and hemorrhagic, purulent exudates discharged from the canal. The working length was estimated using an apex locator and then confirmed by radiograph. Biomechanical preparation was done with K-file 10–40 using a step-back technique. During the instrumentation, the canal was irrigated copiously with 3% sodium hypochlorite solution using a 27-gauge endodontic needle after each instrument. The canals were dried with sterile paper points, dressing with calcium hydroxide was given, and temporary closure was done. The calcium hydroxide dressing was changed after every 1 week for 3 times. After 3 weeks, the discharge from the canals did not cease completely. The treatment procedure was changed. The canals were irrigated following the same protocol and were dried with sterile paper points followed by the dressing of triple antibiotic paste (ciprofloxacin, metronidazole, and minocycline –100 mg of each drug in 0.5 ml total volume) with the help of a lentulo spiral. The dressing was changed after every month for 3 months until the teeth became asymptomatic. On intraoral examination, teeth showed no pain on percussion, soft tissues were found healthy, and the canals were dry. Final irrigation was done with 2% chlorhexidine and obturated with gutta-percha using a lateral compaction technique. The restoration was accomplished with silver amalgam [Figure 2].

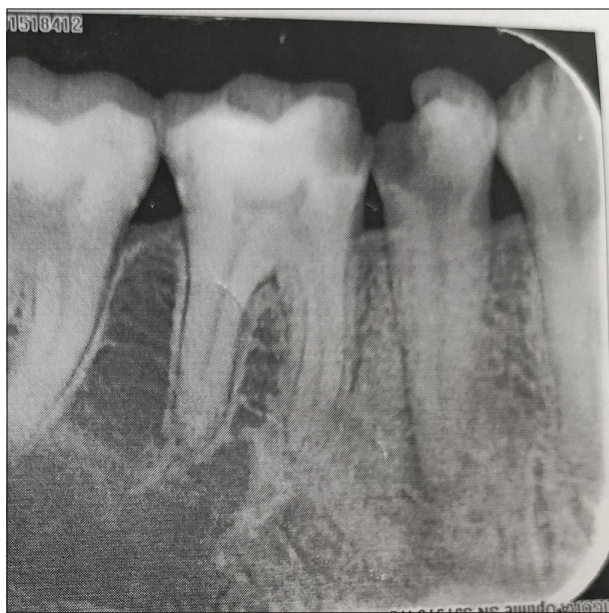


Figure 1: Pre operative radiograph.

CASE 2

A 37-year-old female reported to the Department of Conservative Dentistry and Endodontics with a complaint of pain in her lower right region. Her medical status was non-contributory. Two months earlier, she noticed the formation of the sinus in relation to 46 with purulent discharge. An intraoral examination revealed the presence of sinus and inflamed gingival in relation to the concerned tooth. The electronic pulp test was negative for the same. An intraoral periapical radiograph showed radiolucency involving the coronal pulp, furcation area, and extending up to the mesial root apex of the concerned tooth [Figure 3]. At the same appointment, the root canal treatment was initiated on tooth 46. The access cavity was done after the placement of a rubber dam. A hemorrhagic, purulent exudate was found. The working length was estimated. Biomechanical preparation was done with K-file 10–40 using a step-back technique. During the instrumentation, the canal was irrigated



Figure 2: Post operative radiograph.

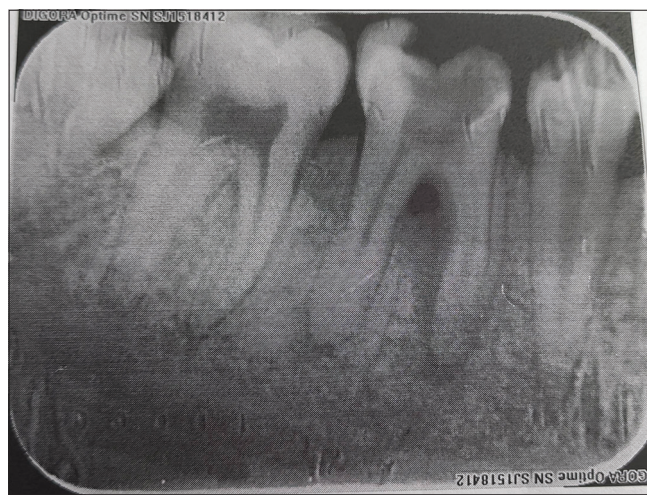


Figure 3: Pre operative radiograph.

copiously with 3% sodium hypochlorite solution using a 27-gauge endodontic needle after each instrument. Drainage was performed until the discharge through the canal ceased. The canals were irrigated, and the smear layer was removed with 17% EDTA followed by 3% sodium hypochlorite. The canals were dried, and a triple antibiotic paste consisting of ciprofloxacin, metronidazole, and minocycline (100 mg of each drug in 0.5 ml total volume) was placed with the help of a lentulo spiral. The dressing was changed after every month for 3 months until the teeth showed no symptoms. On intraoral examination, the teeth showed complete resolution of sinus as soft tissues were found healthy and the canals were dry. Final irrigation was done with 2% chlorhexidine and canals were obturated with gutta-percha using a lateral compaction technique. The restoration was accomplished with composite [Figure 4].

DISCUSSION

In this study, calcium hydroxide was used firstly, but the symptoms were not relieved. The treatment protocol was changed and a triple antibiotic paste was used instead. After its application, the symptoms were resolved. Since the overwhelming majority of bacteria in the deep layers of the infected dentin of the root canal wall consist of obligate anaerobes and so to sterilize the infected root dentin, especially the deep layers, antibacterial medicaments are useful. These compounds should reach the deeper layers of the infected dentin. Several case reports have been published on successful non-surgical management of tooth with a non-vital pulp and persisting sinus tract using TAP, it promotes the healing and repair of the periapical tissue.^[4]

William *et al.* observed a statistically significant reduction in bacteria, following the irrigation and antibiotic paste protocol. About 90% of the bacteria remained positive following irrigation with 10 ml 1.25% sodium hypochlorite.

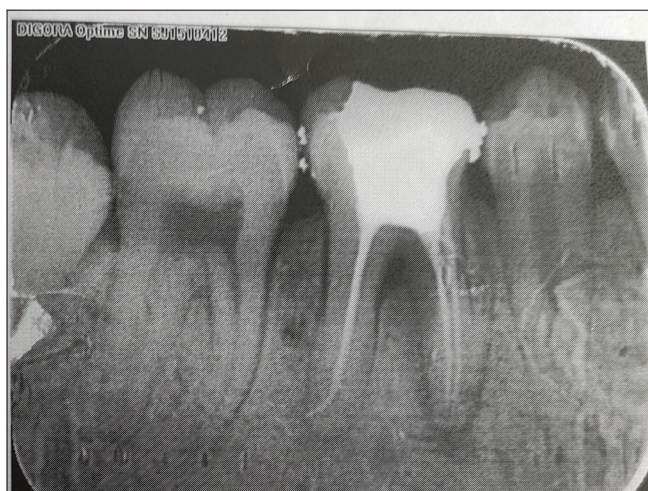


Figure 4: Post operative radiograph

However, this dropped to 30% following the application of the TAP for 2 weeks.^[5]

Bose *et al.* compared TAP, calcium hydroxide and formocresol as intracanal medicaments in non-vital young permanent tooth. The triple antibiotic group showed the highest percentage increase in the dentin wall thickness compared with the other two groups. TAP can help promote the functional development of the pulp–dentin complex.^[6]

Metronidazole was selected as the first choice among antibacterial drugs. As the bacterial flora of the root canal with a periradicular lesion is complex in nature, metronidazole alone cannot kill all bacteria indicating that other drugs may be necessary to sterilize the infected root dentin. Thus, ciprofloxacin and minocycline, in addition to metronidazole, were required to sterilize the infected root dentin.^[7]

TAP was used by various researchers in the treatment of large periapical lesions in the literature, and apical lesions were treated conservatively without the need for surgical methods.^[8]

It has been shown that TAP is effective in regenerative endodontic treatments and in the treatment of large periradicular lesions as an *in vivo* intracanal disinfectant. Iwaya *et al.* used the combination of irrigation solution and TAP in decontamination of immature teeth with pulp necrosis and observed thickening of dentin wall and healing in apical opening and periapical lesion.^[9]

CONCLUSION

In this case report, it is confirmed that conventional root canal treatment, along with intracanal medicaments (triple antibiotic paste), can non-surgically manage the periapical lesions and further promotes healing.

Declaration of patient consent

Patient's consent not required as patients identity is not disclosed or compromised.

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Nil.

Conflicts of interest

There are no conflicts of interest.

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