



Non Surgical Management of Large Cyst like Lesion Using Triple Antibiotic Paste

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Authors' contributions

This work was carried out in collaboration between all authors. Author BP managed the case and wrote the first draft of the manuscript. Author KD corrected the manuscript. Authors CK, Abishek Sharma, Abilash Shankaran managed the literature searches. All authors read and approved the final manuscript

Article Information

DOI: 10.9734/IJRRD/2018/43021

Editor(s):

(1) Roberta Gasparro, Department of Neuroscience, Reproductive Science and Dental Science, University of Naples Federico II, Naples, Italy.

Reviewers:

(1) U. U. Uno, University of Calabar, Nigeria.

(2) Emre İriboz, Marmara University, Turkey.

(3) Neha Sisodia, Ram Manohar Lohia Hospital, India.

Complete Peer review History: <http://www.sciencedomain.org/review-history/25894>

Case Study

Received 24th May 2018
Accepted 27th July 2018
Published 16th August 2018

ABSTRACT

Large periapical lesions in anterior teeth are usually associated with trauma. Bacteria, their toxins, immunologic agents, tissue debris and products of tissue necrosis from the pulp get in touch with the periapical area through various foramina of the root canals resulting to inflammatory and immunologic reactions. Calcium Hydroxide was the usual intra canal medicament of choice. However, due to no improvement with Calcium Hydroxide treatment, the medicament was changed to triple antibiotic paste. This case report describes successful non surgical management of a large cyst like lesion using triple antibiotic paste consisting of Metronidazole, Ciprofloxacin and Minocycline. Care should be taken for the patients, who are sensitive to chemicals or antibiotics.

Keywords: *Non-surgical; cyst; lesion; antibiotic paste.*

1. INTRODUCTION

One of the most common reasons for discoloration and necrosis of pulp in young anterior teeth is trauma. Periapical lesions are usually a sequel to pulp diseases. Large periapical lesions in anterior teeth are usually associated with trauma [1]. Bacteria, their toxins, immunologic agents, tissue debris and products of tissue necrosis from the pulp reach the periapical area through various foramina of the root canals and give rise to inflammatory and immunologic reactions.

Endodontic therapy is mainly aimed at elimination of these microorganisms and prevention of infection. Calcium Hydroxide was the most commonly used intra canal medicament. However, recent evidences have shown the limitations of Calcium Hydroxide. Due to the complexities of the root canal infection, it is difficult for any single antibiotic to effectively disinfect the canal. Here the role of a combination of antibiotics becomes imperative and the most promising antibiotics appears to be Metronidazole, Ciprofloxacin and Minocycline [2]. The present case demonstrates the use of triple antibiotic paste as an effective intra canal medicament for the treatment of large cyst like lesions.

2. CASE REPORT

A twenty year old female patient was referred to the Department of Conservative Dentistry and Endodontics, with discoloration in the upper right central incisor and also with a retention wire in the upper arch at post-orthodontic treatment. Her medical history revealed that she had a fall almost 8 yrs back. Radiographic examination revealed a huge cyst like periapical lesion associated with right central and right lateral incisor (Fig. 1). Vitality testing with dry ice (RC Ice, Prime Dental) indicated that both the teeth were nonvital. After obtaining an informed written consent, endodontic treatment was initiated in both the central and lateral incisors following isolation with rubber dam. Both the teeth, mainly the central incisor showed a lot of discharge. The working length was measured with apex locator (ROOT ZX MORITTA) and later confirmed with radiographs. Biomechanical preparation was carried out and the central incisor was widened to an apical size of 50 and lateral incisor to an apical size of 40. Irrigation was carried out with 3% sodium hypochlorite and saline solution. An intra canal dressing with

Calcium Hydroxide was placed in the canals and the access opening was sealed with temporary dressing material (Cavit G). The Calcium Hydroxide was changed every fifteen days for a period of one month. After one month when the dressing was removed it was found that the discharge was still persistent in the central incisor. Hence, it was decided to place triple antibiotic paste consisting of Metronidazole, Ciprofloxacin and Minocycline in both the teeth. After one month the discharge ceased, however, a fresh dressing of triple antibiotic paste was placed. At the end of the third month from the beginning of the treatment, both the teeth showed no discharge and finally obturation was done with gutta-percha cones and SealApex (SybronEndo) as sealer, using lateral condensation technique (Fig. 2). A week later, crowns were put on both the teeth. Radiography was followed up after one year and it showed considerable resolution of the periapical radiolucency (Fig. 3).



Fig. 1. Pre-operative



Fig. 2. Obturation



Fig. 3. One year follow up

3. DISCUSSION

Periapical lesions cannot be differentially diagnosed as cysts or granulomas only on radiographic evidence [1,3]. According to Natkin et al. [4] in a radiographic lesion of 200 mm² or larger, the incidence of cysts is about 100%. The treatment options in large periapical lesions have been non surgical management, apical surgery and extraction [5]. Various non surgical methods have been used in the treatment of large periapical lesions including conventional root canal therapy without adjunctive means, passive decompression, active non surgical decompression technique using the Endo-Eze vacuum system, aspiration of cystic fluid using a buccal/palatal approach, or through root canal, methods using intracanal medicaments, lesion sterilization and repair therapy and apexum procedure [6]. Non surgical management of large lesions is usually more comfortable for the patients. The present treatment concept is to offer non surgical option first failing which the other is to be considered. There are a lot of advantages of a non surgical approach, such as the elimination of risk of affecting vitality of neighboring teeth. Damage to adjacent anatomic structures can be avoided without compromising the bone support of the neighbouring teeth [7].

The antimicrobial effects of Calcium Hydroxide has been well documented, especially in case of periapical lesions. However, in the present case, the Calcium Hydroxide treatment was found to be ineffective. Also, Andreasen et al. in a study showed that long term use of Calcium Hydroxide can weaken the dentin [8]. Microorganisms present in dentinal tubules could possibly serve

as a reservoir from which tissue infection and reinfection could occur. Dentin itself also could possibly have an inhibitory effect on the bactericidal efficacy of Calcium Hydroxide as demonstrated by Portenier et al. [9]. Hence, it was decided to use triple antibiotic paste and considerable improvement of symptoms was observed.

Metronidazole has a wide antibacterial spectrum against protozoa and anaerobic bacteria. However, it has no activity against aerobes. Hence, a combination of Ciprofloxacin and Minocycline was suggested. Tetracycline which includes doxycycline and Minocycline are effective against most spirochetes and many anaerobic and facultative bacteria. Ciprofloxacin has a very potent activity against gram negative pathogens but very limited activity against gram positive bacteria [4]. Systemic administration of antibiotics depends on patient compliance followed by absorption and reaching the infected site via circulatory system. However, this will not be possible in teeth with necrotic pulps and those without pulp tissues. As a result, the only reliable and effective option is direct delivery through local application [10].

Sato et al. [11] mentioned that the above drug combination was effective against bacteria in the deeper layers of dentine. William et al.[2] showed the effectiveness of triple antibiotic paste in the disinfection of immature teeth with apical periodontitis. Other studies showed the effectiveness of a combination of metronidazole, Ciprofloxacin and Minocycline in killing endodontic pathogens from infected root canals *in vitro* [5].

Iwaya et al. [12] described a treatment procedure for management of open apex in which they disinfected the canal with sodium hypochlorite irrigation and two antimicrobial agents (metronidazole and Ciprofloxacin). Although open apex cases can be treated by conventional apexification procedures, these do not increase wall thickness or promote development of root length. Bose conducted a comparative study among triple antibiotic paste, Calcium Hydroxide and formocresol as an intracanal medicament in non vital young permanent teeth. The triple antibiotic paste group showed the maximum percentage increase in the thickness of dentin wall [13].

However, there are a few concerns regarding the use of triple antibiotic paste, like bacterial

resistance, allergy and tooth discoloration. Kim et al. [14] in an *in vitro* study identified that the discoloration may be due to Minocycline. Variations of antibiotic pastes have been suggested to avoid discoloration. Arestin was suggested as a substitute for Minocycline by Trope et al [15]. Thibodeu and Trope [16] suggested the use of Cefaclor instead of Minocycline. An approach to prevent discoloration by sealing dentinal tubules with dentin bonding agent and composite was suggested by Reynolds [17]. However this only reduced discoloration, but did not prevent it.

4. CONCLUSION

This report demonstrated that conventional endodontic treatment with Calcium Hydroxide was not enough for treating large cyst like lesions. Hence, triple antibiotic paste was considered and it was found to be successful in disinfection and healing of large cyst like lesions. However, care should be taken if the patients are sensitive to chemical or antibiotics.

CONSENT

As per international standard or university standard, patient's written consent has been collected and preserved by the authors.

ETHICAL APPROVAL

As per international standard or university standard written ethical permission has been collected and preserved by the authors.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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