

DISINFECTION OF IMMATURE NECROTIC PERMANENT TOOTH WITH PERIAPICAL LESION USING TRIPLE ANTIBIOTIC PASTE– A CASE REPORT

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Abstract: The immature tooth with a necrotic pulp and apical periodontitis presents multiple challenges to successful treatment. The traditional method of cleaning and disinfection of the root canal system used in mature tooth are limited by the anatomy of the immature tooth, that are susceptible to fracture. Therefore we must rely on placement of medicament to achieve adequate reduction of intracanal bacteria. A triple antibiotic paste consisting of metronidazole, ciprofloxacin, clindamycin has been shown to be very effective against pathogens commonly found inside root canal.

This case report describes disinfection protocol for treatment of immature permanent necrotic tooth with large periradicular lesion using triple antibiotic paste. Follow up radiograph of case showed progressive healing of periradicular lesion and root formation which substantiate the effectiveness of triple antibiotic paste in treatment of immature tooth with necrotic pulp.

Keywords – Triple antibiotic paste, Necrotic tooth, Periapical lesion

INTRODUCTION

An immature permanent tooth having blunderbuss canal and open apex can be an endodontic challenge because of difference in obtaining apical seal, existing thin walls which are susceptible to fracture.¹

The major challenges associated with endodontic treatment of teeth with open apices are achieving complete debridement, canal disinfection and optimal sealing of root canal system.²

As instruments cannot be used properly in teeth with open apices, cleaning and disinfection rely on chemical action of sodium hypochlorite as an irrigant and intracanal medicament.³ NaOCl is known to be toxic, especially in high concentration. When rinsing teeth with open apices, there is increased risk of pushing irrigant beyond apical foramen.⁴ Therefore we must rely on placement of medicament to achieve adequate reduction of intracanal bacteria. A triple antibiotic paste consisting of metronidazole, ciprofloxacin, clindamycin has been shown to be very effective against pathogens commonly found inside root canal system.⁵

Long term application of calcium hydroxide Ca(OH)₂ has traditionally been used for inducing apexification in

immature permanent teeth with open apices, pulpal necrosis and periradicular diseases. Unfortunately, use of Ca(OH)₂ for apexification procedures has several shortcomings such as prolonged treatment time, porous callus bridge formation, inability to promote continued root development and thickness of lateral dentinal walls, and a high pH which promotes necrotic and degenerative changes in apical tissue in contact.¹

To overcome all such shortcomings, the concept of Apexification with material Mineral Trioxide Aggregate was introduced.

MTA is a powder consisting of fine hydrophilic particles that bind in presence of moisture. Set MTA provides good seal and excellent marginal adaptation.⁶ In vivo studies have confirmed biocompatibility of material and have shown a hard tissue inductive effect.³ MTA can be used as an apical plug allowing for prompt obturation of root canal system.^{5,7} Our case report presents effectiveness of triple antibiotic paste in the disinfection of immature necrotic permanent tooth with periradicular lesion.

CASE REPORT

A 15 year old male patient was referred for evaluation on the left maxillary lateral incisor. On clinical examination, the patient was slightly symptomatic to percussion, and sinus tract was present that traced to the apex of tooth. Radiographic examination revealed that the tooth had an incompletely developed root with periapical radiolucency (Fig. 1a). The diagnosis of pulp necrosis and chronic apical abscess with a sinus tract was made. Access Cavity was prepared and purulent hemorrhagic drainage obtained. Working length was established. The root canal was irrigated with 2.5% NaOCl for 10 minutes and dried with paper points, and a mixture of ciprofloxacin, metronidazole, and minocycline paste as described by Hoshino et al was introduced into the canal with a lentulo spiral (fig 1b). The access cavity was closed with cavit (3M, ESPE).

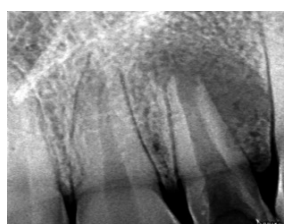


Fig 1a-Pre operative



Fig 1b Triple antibiotic paste placed



Fig 1-c MTA Apical plug



Fig 1-d Obturation with Composite coronal restoration



Fig 1e-1 year follow up

The patient returned 3 weeks later and the tooth was asymptomatic with resolution of sinus tract. After the canal debridement, a master gutta-percha point was selected and adjusted to 3 mm short of working length. An Apical plug of about 3mm of MTA (White MTA-Denstply,Tulsa) was placed with MTA carrier and adapted to apical canal walls using the pre-adjusted gutta-percha point. The position of the MTA plug was confirmed radiographically (fig 1c) and a sterile cotton pellet moistened with sterile water was placed over it and access cavity was sealed with Cavit(3M ESPE).After a week, the hard set of MTA was confirmed and obturation was completed by lateral compaction using gutta-

percha and AH Plus sealer (Dentsply Maillefer) followed by coronal composite restoration (fig 1d).One year follow up radiograph revealed progressive healing of the lesion with hard tissue formation in the apex (fig 1e).

DISCUSSION

As instruments cannot be used properly in teeth with open apices, cleaning and disinfection of the root canal system rely on the chemical action of NaOCl as an irrigant and calcium hydroxide as an intracanal dressing.⁸ NaOCl is known to be toxic, especially in high concentrations. When rinsing immature teeth with open apices, there is an increased risk of pushing the irrigant beyond the apical foramen. Therefore, it is advisable to use less concentrated NaOCl, which is less toxic.⁹

Because of the complexity of the root canal infection, it is unlikely that any single antibiotic could result in effective sterilization of the canal. More likely a combination would be needed to address the diverse flora encountered. A combination of antibiotics would also decrease the likelihood of the development of resistant bacterial strains.¹⁰ Hoshino et al¹¹ performed an in vitro study testing the antibacterial efficacy of these drugs alone and in combination against the bacteria of infected dentin, infected pulps, and periapical lesions. Alone, none of the drugs resulted in complete elimination of bacteria. However, in combination, these drugs were able to consistently sterilize all samples. In- vivo studies also confirmed this.¹² We used the same combination to disinfect the root canal because it has been reported that the sterilization of the root canal and periradicular region results in good healing of periapical diseases.¹¹

Caution should be taken in general when giving local or systemic drugs. Although the volumes of the drugs applied in this therapy were small and there were no reports of side effects, care should be taken if patients are sensitive to chemicals or antibiotics.

Case selection is important in open apex treatment protocol. Apical revascularization should be encouraged in immature necrotic tooth having opening greater than 1 mm in a mesiodistal dimension radiographically. The size of opening must be sufficient to allow ingrowth of vital tissue.¹³ In our case the opening of the apex was minimal hence we decided to give MTA apical plug.

A 3-4-mm thick MTA plug was placed in the apical area of the root canal and obturation was completed by lateral compaction, using gutta-percha. Placement of the MTA plug facilitated obturation of the root canal without overextension of the filling material. Various studies have shown that intracoronally bonded restorations can internally strengthen endodontically treated teeth and increase their resistance to fracture¹⁴ hence, coronal restoration was done with composite.

CONCLUSION

Triple antibiotic paste can be an effective disinfectant in treatment of immature necrotic tooth with periradicular lesion. The lesion showed progressive healing after using a triple antibiotic paste in the canal and one year follow up radiographs revealed hard tissue formation in the apex.

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