



Comparative Effect of Commercially Available Endodontic Sealers Against *Enterococcus faecalis*

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Received: 31-03-2017; Revised: 22-05-2017; Accepted: 08-06-2017.

ABSTRACT

The aim of the study is to compare the effect of commercially available endodontic sealers against *Enterococcus faecalis*. Endodontic sealers are mainly used in root canal treatment. The main aim of root canal therapy is the removal of microbial contaminants in conjunction with the total closure of the root canal system. A root canal sealer along with solid core material plays a major role in determining the rate of success of the treatment. The use of root canal filling materials with antibacterial activity is considered beneficial in reducing the number of microorganisms and to eradicate the infection. The Antimicrobial effects of few endodontics sealers are studied. Filter paper discs measuring 6mm diameter were impregnated with different root canal sealers and its activity was tested using disc diffusion technique. In the present study the Antimicrobial activity of 3 sealers were tested against *Enterococcus faecalis*, which is considered to be resistant to endodontics treatment. All the sealers tested showed different degree of antibacterial activity with endomethasone showing maximum.

Keywords: Disc diffusion, antibacterial, zone of inhibition, root canal sealers.

INTRODUCTION

Root canal treatment is the process of removing infection, injuries or dead pulp from the tooth. Failure during and after endodontic treatment, is linked to the presence of bacteria in the root canal. The most effective ways to eliminate them are by means of instrumentation and anti-bacterial irrigation. The use of root canal filling materials with antibacterial activity is considered beneficial in reducing the number of microorganisms and to eradicate the infection. Root canal sealer is used along with Gutta Percha for obturation of root canals. Some root canal sealers can be complete sealers where no Gutta Percha is necessary. Endodontic sealers have varying base compositions. The component Zinc Oxide Eugenol can be placed in the root canal cavity temporarily to reduce inflammation and sensitivity¹. Application of endodontic sealers can be via syringe, hand mix and premeasured capsules.

One of the main significance of endodontic sealers is to eliminate the microorganism from the root canal system. This is done by the mechanism cleaning and shaping, supplemented by antibacterial irritants. This may reduce but doesn't eliminate the microorganism². The root filling is to be prevented should be prevent coronal reinfection and entomb the remains bacteria within the canal. The possible treatment is the use of root canal sealers with Antimicrobial properties to improve the outcome of endodontic treatment.

MATERIALS AND METHODS

In this study, the antimicrobial efficacy of commercially available root canal sealers namely zinc oxide eugenol,

Endomethasone, MTA Fillapex were evaluated against *Enterococcus faecalis*. All sealers were mixed according to manufacturer instructions and loaded on to sterile filter paper discs.

Zinc Oxide Eugenol

Zinc oxide eugenol (ZOE) is a material created by the combination of zinc oxide and eugenol contained in oil of clover. It is often used in dentistry. They are used as root canal sealers and for making dentures. They are also used in temporary filling^{5,6}. They have anti-microbial property.

Endomethasone

Endomethasone is a zinc oxide-eugenol-based (paraformaldehyde-containing) sealer that has shown high antibacterial activity^{3, 4}. However, its paraformaldehyde content has been the subject of discussion due to the long-lasting inconvenience and disabling complications caused by the use of drugs that contain such a substance

MTA Fillapex

MTA-based salicylate resin root canal sealer, versatile for every obturation method. It delivers easily and without waste, and exhibits excellent handling properties with an efficient setting time. The paste formula contains 13.2% MTA. Mineral Trioxide Aggregate (MTA) is hands-down the most biocompatible material in endodontics. It yields an impressive, hermetic seal in which the MTA particles expand, preventing microinfiltration^{7,8}. And, MTA simultaneously releases free calcium ions [Ca²⁺] to accelerate the healing process by stimulating the regeneration of the adjacent tissues.

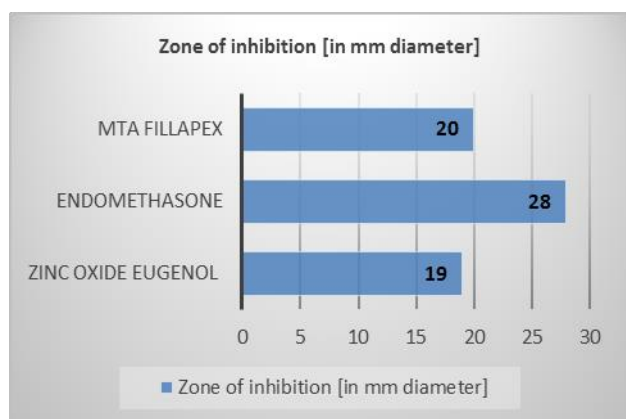


Method

The antibacterial effect of the root canal sealers is tested against *Enterococcus faecalis* by disc diffusion technique. The broth culture of the bacterial strain compared to Mac Farland's standard 0.5 was prepared. Lawn culture of the test organism, *Enterococcus faecalis* was made on the Muller Hinton agar [MHA-Hi media M1084] plates using sterile cotton swab and the plates were dried for 15 minutes. Filter paper discs loaded with different root canal sealers were placed on the agar plate inoculated with the test organism. The inoculated plates with the sealers were kept at room temperature to allow the diffusion of the agent through the agar and were incubated at 37 degree Celsius overnight and zone of inhibition was measured in millimeter diameter.

RESULTS

It is found that among all the endodontic sealers, endomethasone shows the maximum zone of inhibition of about 28mm. Zinc oxide eugenol shows zone of inhibition of about 19mm and MTA fillapex of about 20mm.



S.no	Root canal sealers	Zone of inhibition (mm)
1	Zinc oxide eugenol	19
2	Endomethasone	28
3	MTA fillapex	20

DISCUSSION

Enterococci are gram positive cocci that can occur singly, in pairs, or as short chains⁹. *E. faecalis* is normal inhabitant of the oral cavity¹¹. The prevalence of *E. faecalis* increased in oral rinse sample of the people. The *E. faecalis* one of the main microorganism that contaminates the root canal after endodontic treatment¹². So it is very important to eliminate such microorganism. *E. faecalis* possesses several virulence factors, its ability to survive the effect of root canal treatment and persist as pathogen in the root canals and dentinal tubules of teeth^{10, 13}. The success of root canal treatment depends upon eliminating microorganisms from the root canal system and to prevent reinfection^{14,15}.

So these endodontic sealers are used, which kills these micro organisms and make the root canal free from micro organism. The root canal sealant used in this study, Endomethasone shows the maximum zone of inhibition of about 28mm.

CONCLUSION

In the present study the Antimicrobial activity of 3 sealers were tested against *Enterococcus faecalis*, which is considered to be resistant to endodontics treatment. All the sealers tested showed different degree of antibacterial activity with endomethasone showing maximum.

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Source of Support: Nil, Conflict of Interest: None.

