ORIGINAL RESEARCH PAPER

Volume-7 | Issue-6 | June-2018 | PRINT ISSN No 2277 - 8179

INTERNATIONAL JOURNAL OF SCIENTIFIC RESEARCH

PULPECTOMY OBTURATION : ENDOFLAS : BITTER OR BETTER

Dental Science

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ABSTRACT

Pulpectomy is the treatment of choice in primary teeth that facilitates complete removal of necrotic pulp followed by filling with inert resorbable material. A major requirement for a successful root canal treatment of primary teeth is that the root canal filling material must possess the necessary properties of being antibacterial, resorbable at the same rate of the root and harmless to periapical tissues and the developing tooth bud. In addition, it must easily fill the canals, adhere to the walls, should not shrink and must readily resorb if passed beyond the apex, be easily removed if necessary, must be radiopaque and causes no discoloration of the tooth.

KEYWORDS

Pulpectomy , Endoflas , Obturating materials

Introduction : During the process of growth and development in children, primary teeth function as an integral component of dentition until they are physiologically exfoliated without endangering their successor. Thus preservation of primary teeth until exfoliation is of great importance. In case of gross mutilation or dental caries involvement that could endanger the strategic existence of primary teeth endodontic treatment becomes a modality of choice.

Infected teeth should be treated and maintained in the dental arch as natural space maintainer, provided they can be restored to function and remain free from the disease. Owing to the task of complete debridement related to the canal morphology and close presence of succedaneous tooth, the obturating material should be biocompatible and eliminate these residual pathogens. It should neutralize their toxic products and prevent the canal reinfection to create favorable environment for the healing process to occur.

The microorganisms play important role in the development and perpetuation of pulp and periapical diseases. The infection of the root canal system is polymicrobial, consisting of both aerobic and anaerobic bacteria, because of complexity of the root canal infections any single antibiotic could not result in effective sterilization of canal, therefore a combination of drugs is needed to address the diverse flora. So, the use of triple antibiotic paste is advocated.

The requirements of a root-filling material for primary teeth are:

1. It should be radiopaque.
2. It should be harmless to the adjacent tooth germ.
3. It should not be soluble in water.
4. It should not irritate the periapical tissues, nor coagulate any organic remnants in the canal.
5. It should not set to a hard mass, which could deflect an erupting succedaneous tooth.

Rewal et al (2014) compared clinical and radiographic success rates of Zinc Oxide Eugenol with Endoflas for root canal filling of primary teeth at 3, 6, 9 months and showed that Endoflas has better results than Zinc Oxide Eugenol. Therefore Endoflas should be material of choice for root canal treatment in deciduous dentition.[1]

In case of gross mutilation or dental caries involvement that could endanger the strategic existence of primary teeth endodontic treatment becomes a modality of choice. Root canal therapy was advocated as early as 1932 as a method for retaining those primary teeth which would otherwise be lost. Pulpectomy is defined as removal of entire pulp and subsequent filling of the canals of primary teeth with a suitable resorbable material. Pulpectomy helps in preserving a pulpally involved primary tooth by eliminating bacteria and ensure hermetic seal of the root canals so that primary teeth complete its function until normal exfoliation can occur without affecting the oral health of child.[2]

Zinc oxide eugenol (ZOE) :

Zinc oxide eugenol was discovered by Bonastre and subsequently used in dentistry by Chisholm. It was the first root canal filling material to be recommended for primary teeth, as described by Sweet in 1930.

ZOE, since its discovery by Bonastre in 1837 and subsequent first use in dentistry by Chrisholm in 1876, has been used extensively in pedodontic practice. It is most frequently used root canal filling material for primary teeth.[3]

Kennedy D.B. (1976) studied the resorption of ZOE paste from the periapical tissue. He reported that ZOE paste does not get resorbed and it may result in deflection of the succedaneous teeth because of its hardness. Chawla H.S. et al (2008) has reported that clinical studies conducted on animals and humans have shown the success rate of ZOE paste used alone to range from 65-95%. To improve its penetration and success rate, ZOE in combination with different compounds like formocresol, formaldehyde, paraformaldehyde and cresol, have been tried out, but the addition of these compounds neither increased the success rate nor made the material more restorable as compared to ZOE alone. Moreover, the use of phenolic compounds is not advocated due to their fixative nature, they have been proven to have cytotoxic, mutagenic and carcinogenic potential.[4]

Triple Antibiotic Paste:

Triple antibiotic paste (TAP) containing metronidazole, ciprofloxacin, and minocycline has been reported to be a successful regimen in controlling the root canal pathogen and in managing non-vital young permanent tooth. This paper reviews the existing literature on biocompatibility, efficiency, drawbacks of TAP in endodontic therapy and pulp revascularization.

R. Vijayraghavan et al (2012) reviewed the effectiveness of triple antibiotic pastes(TAP) Metronidazole, Ciprofloxacin and Minocycline in root canal therapy and concluded that TAP can be effectively used for sterilization of canals and healing of periapical pathology and also TAP seems to be promosing medicament in the sterilization and revascularization. But development of resistant bacterial strains and tooth discoloration are the possible drawbacks of this technique.[5]

The mixture of Ciprofloxacin, Metronidazole and Minocycline penetrated through the dentine from the root canal and eradicated bacteria from the infected root dentine. This strongly suggests that infected root dentine can be sterilized by topical application of the drug combination to root canals in root canal treatment. 3Mix (ciprofloxacin, metronidazole and minocycline) can easily dissipate

through these regions and induce a sterile zone, which is expected to promote tissue repair The penetration ability of these drugs was improved by mixing these drugs with propylene glycol and macrogol to form ointment base and the penetration ability of propylene glycol was clearly demonstrated by Cruz et al (2002).[6]

Endoflas

Endoflas is a resorbable paste produced in South America and contains components similar to that of Vitapex, with the addition of zinc oxide and eugenol. This paste is obtained by mixing a powder containing tri-iodomethane and iodine dibutilorthocresol (40.6%), zinc oxide (56.5%), calcium hydroxide (1.07%), barium sulphate (1.63%) and with a liquid consisting of eugenol and para-monochlorophenol.[7]

The material is hydrophilic and can be used in mildy humid canals. It firmly adheres to the surface of the root canals to provide a good seal. Due to its broad spectrum of antibacterial activity, Endoflas has the ability to dis-infect dentinal tubules and difficult to reach accessory canals that cannot be disinfected or cleansed mechanically. The components of endoflas are biocompatible and can be removed by phagocytosis, hence making the material resorbable.

Resorption of the material at the rate of the tooth is a criteria less met by the above materials.

ENDOFLAS, a mixture of Calcium hydroxide, Zinc Oxide Eugenol and Iodoform is said to have the advantage of resorption limited to the excess extruded exrtaradicularly; without washing out intraradicularly. Ramar K and Mungara J (2010) considered ENDOFLAS to be an effective root canal filling material in primary teeth with a success rate of 95.1% ($p > 0.05$, statistically insignificant)over a period of 9 months due to its healing ability, bone regeneration characteristics and its resorption of excess material without washing within the roots. In the present study, ENDOFLAS gave the highest success rate of 94.0%, which was comparable with the results obtained.[8]

CONCLUSION:

Primary teeth treated with Zinc Oxide Eugenol showed least improvement due to its slowest resorption of excess Zinc Oxide Eugenol paste. Whereas Triple Antibiotic Paste due to its difficult manipulation and faster resorption rate than physiological resorption of primary tooth also fall on a shorter note than Endoflas.

The Endoflas showed better results than Triple Antibiotic Paste & Zinc Oxide Eugenol and thus it has a potential to become a promising alternative as a pulpectomy medicament. However, other research has to be conducted in order to determine the effect of these materials particularly Endoflas on succedaneous tooth for a longer term of follow up.

It has been found that the current obturating materials for primary teeth while providing satisfactory clinical results still need to be modified to suit the various clinical situation that are encountered. Due to the drawbacks of Zinc oxide eugenol material several other materials have been investigated and various combinations tried with some degree of success. The current combinations of calcium hydroxide and iodoform seem to provide better results than zinc oxide eugenol cements. However, further controlled studies and research is required to find the ideal obturating material for primary teeth.

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