

PULPECTOMY TECHNIQUE FOR PRIMARY TEETH

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ABSTRACT

The treatment of severely infected primary teeth can be difficult, and treatment options for these teeth are very few. One of the options is root canal treatment. This paper describes pulpectomy technique for primary teeth, including general considerations, indications, contraindications, clinical procedure, and some helpful tips to be considered during pulpectomy.

Key words: Pulpectomy technique, procedure, primary teeth.

INTRODUCTION

A major objective of modern dentistry for children is to maintain the integrity of the primary dentition until normal exfoliation, for the purpose of promoting function, esthetics and phonetics¹. The treatment of severely infected primary teeth can be challenging and there are few options for treating such teeth. The treatment options include; extraction and space maintenance (if necessary), and pulpectomy (if possible)². American Academy of Pediatric Dentistry (AAPD) defines pulpectomy as a procedure which involves removal of the roof of pulp chamber in order to gain access to the root canals which are debrided, enlarged, disinfected and filled later with a resorbable material³. Consequently, the tooth can be maintained in the arch without vital pulp tissue, but not compromising the function of the tooth³. A high success rate of pulpectomy in primary teeth has lead pediatric dentists to prefer pulpectomy over extraction and space maintainer⁴. However, pulpectomy in primary teeth has generally remained controversial for a number of reasons such as difficulty in obtaining adequate access

to the root canals in the relatively smaller mouths of children, complexity of root canal system in primary molars, risk of injury to permanent tooth germ during cleaning and filling of root canals, difficulties with root canal filling materials and methods of obturation⁵⁻⁷. Before selecting a tooth for pulpectomy, the clinician need to contemplate on some general considerations, indications and contraindications for the procedure⁸.

GENERAL CONSIDERATIONS

The patient should be healthy and cooperative. If any systemic disorders are present that would compromise a child's response. The child's physician should be consulted before the treatment.

- Informed consent should be obtained, with a clear explanation of the procedure to the parents⁸.

DENTAL CONSIDERATION

- Tooth selected for pulpectomy should have resorption of less than one-third of the root.

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— The tooth must be restorable after root canal caries treatment⁸.

INDICATIONS

Tooth indicated for pulpectomy should have one or more of the following criteria:

- History of spontaneous pain.
- Evidence of radicular pathologic lesion with or without caries involvement.
- Alveolar swelling.
- Pus discharge from canal(s).
- Continuous bleeding even after amputation of the coronal pulp tissue during pulpotomy.
- No pulp tissue remaining when the pulp chamber is entered.
- Presence of sinus tract.
- Presence of inter-radicular or periapical radiolu-cency ^{8,9}.

– CONTRAINDICATIONS

- Unrestorable tooth.
- Teeth with pathological lesion extending to the tooth germ of the successor tooth.
- Teeth with evidence of extensive internal/external pathological root resorption.
- Patient with systemic disease such as congenital or rheumatic heart disease, leukemia and children on long term corticosteroid therapy or those who are immunocompromised ^{8,9}

CLINICAL PROCEDURE

The most commonly used pulpectomy technique is described step by step below⁹:

1. Pre-operative periapical radiograph should be taken.
2. The tooth is anesthetized and isolated with rubber dam.

3. Before gaining access into pulp chamber, all should be removed.
4. The access opening of pulp chamber in primary teeth are similar to that of permanent teeth with great care to avoid perforation of pulpal floor.
5. Based on the radiographic measurements, the canals are negotiated using endodontic files. To avoid overextension, the working length is established 1 to 2 mm short of radiographic length. The canals are enlarged several sizes beyond the first file that fits snugly into the canal up to minimum final size of 30 to 35.
6. Copious irrigation with sodium hypochlorite must be utilized during instrumentation to help in cleaning the many ramifications of the primary root canal and to facilitate biomechanical preparation of the root canal.
7. Following the instrumentation, the canals are dried and cotton pellet moistened with root canal medicament (CMCP or formocresol) is placed in pulp chamber and the tooth restored temporarily.
8. Once the tooth is free of all clinical signs and symptoms of infection, the tooth is isolated with rubber dam and temporary filling removed.
9. Canals are irrigated with sodium hypochlorite and last few files are used again in the canals to ensure the removal of any remaining debris.
10. The canals are then dried and filled with resorbable paste of Zinc oxide eugenol (ZOE) without catalyst to allow sufficient working time. The ZOE is mixed to a very thick consistency and carried into the pulp chamber. The ZOE is then pushed into the canal with help of endodontic plugger or with cotton pellet.
11. Radiographs are taken during the filling procedure to verify the depth of the filling material. Ideally, the canals are obturated without overextension

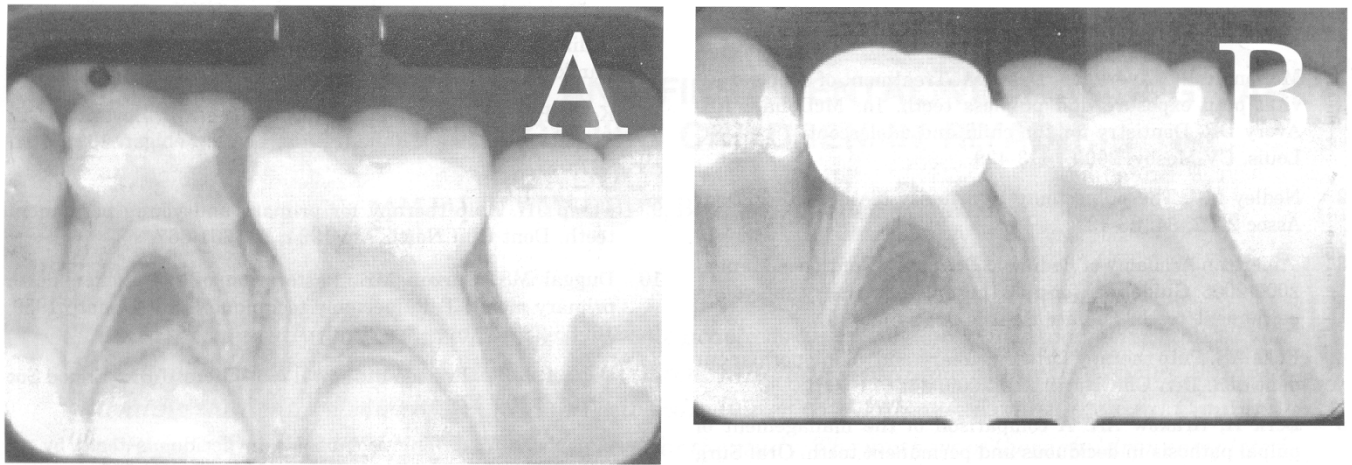


Fig: Periapical radiographs show successful ZOE pulpectomy for the mandibular first primary molar. A. Preoperative radiograph (note inter-radicular radiolucency). B. Six months post-operative radiograph (note healing of inter-radicular radiolucency).

into the periapical tissue. Small amount of ZOE inadvertently forced through the apex is left alone as the paste is resorbable.

12. The pulp chamber then filled with a fast setting ZOE cement and the access opening restored permanently. In primary molars, it is advisable to restore the tooth with a stainless steel crown.
13. The patient must be periodically recalled to check for success of the treatment. The Figure shows periapical radiographs of successful ZOE pulpectomy case for a mandibular first primary molar.
14. The tooth should remain asymptomatic, firm in the alveolus, free of pathosis and resorb normally without interfering with the eruption of the permanent tooth. However, if evidence of pathosis is detected during recall visits, extraction of the pulpectomized tooth is indicated with construction of a space maintainer (if necessary)⁹.

SOME HELPFUL TIPS

Although, it is not compulsory to administer local anesthesia for primary teeth with necrosed pulps, and during the second visit of pulpectomy; it may be helpful to anesthetize gingiva for rubber dam placement⁹.

- Over instrumentation of root canals in primary teeth is not recommended, since the aim of the instrumentation in primary teeth is to clean the canals and not to shape the canal as in permanent teeth⁹.

Use of rotary instruments, such as Gates-Glidden drills in root canal instrumentation of primary teeth is contraindicated⁹.

- Pulpectomy for primary teeth can be carried out in a single visit, if the patient is not complaining of acute symptoms or there is no pus discharge from the canals¹⁰.

The use of gutta-percha or silver points as a root canal filling material in primary teeth is contraindicated as these would not resorb and interfere with the eruption of the permanent teeth⁹

- Other techniques may also be used to carry the obturation materials into the canal such as lentulo-spiral and endodontic pressure syringe^{11,12}.
- Other obturation materials such as calcium hydroxide and iodoform may also be used for obturation in primary teeth root canals with favorable success rate¹³.

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