

APEXOGENESIS

It is defined as the treatment of a vital pulp in the permanent teeth by capping or pulpotomy in order to permit continued growth of the root and closure of the open apex.

Objectives

Maintenance of integrity of the radicular pulp tissue to allow for continued root growth.

Indications

- 😊 Indicated for traumatized or pulpally involved vital permanent tooth with incomplete formation of the root apex.
- 😊 No history of spontaneous pain
- 😊 No sensitivity on percussion.
- 😊 No hemorrhage.
- 😊 Normal radiographic appearance.

Contraindications

- 😞 Evidence that radicular pulp has undergone degenerative changes
- 😞 Purulent drainage
- 😞 History of prolonged pain
- 😞 Necrotic debris in canal
- 😞 Periapical radiolucency.

NONVITAL PULP TREATMENT WITH IRREVERSIBLE PULPITIS OR NECROTIC PULP

PULPECTOMY

It involves the removal of the entire pulp and subsequent filling of the canals of the primary teeth with a suitable resorbable material.

It is unwise to maintain untreated infected primary teeth in the mouth. They may be opened for drainage and often remain asymptomatic for an indefinite period. However, they are a source of infection and should be treated or removed. The morphology of the root canals in primary teeth makes endodontic treatment difficult and often impractical. Mature first primary molar canals are often so small that they are inaccessible even to the

smallest barbed broach. If the canal cannot be properly cleansed of necrotic material, sterilized, and adequately filled, endodontic therapy is more likely to fail.

Objectives of Pulpectomy

- ☺ Maintain the tooth free of infection
- ☺ Biomechanically cleanse and obturate the root canals
- ☺ Promote physiologic root resorption
- ☺ Hold the space for the erupting permanent tooth.

Indications of Pulpectomy

- ✓ Patient should be in good general health with no serious disease.
- ✓ Maximum cooperation of patient and parents.
- ✓ A tooth previously planned for a pulpotomy that shows uncontrolled pulpal hemorrhage.
- ✓ Indicated for any primary tooth in absence of its permanent successor.
- ✓ Any deciduous tooth with severe pulpal necrosis provided there is no radiographic contraindication.
- ✓ Primary teeth with necrotic pulps and minimum of root resorption.
- ✓ Pulpless primary teeth with stomas.
- ✓ Pulpless primary teeth in hemophiliacs.
- ✓ Pulpless primary anterior teeth when speech, esthetics are a factor.
- ✓ Pulpless primary molars holding orthodontic appliance.



Note:

In addition to the previous indications, the tooth should have adequate periodontal and bony support.

Contraindications of Pulpectomy

General Contraindications

- ✗ Young patient with systemic illness such as congenital ischemic heart disease, leukemia.
- ✗ Children on long-term corticosteroids therapy.

Clinical Contraindications

- ✗ Excessive tooth mobility.
- ✗ Communication between the roof of the pulp chamber, and the region of furcation.
- ✗ Insufficient tooth structure to allow

Radiographic Contraindications

- × External root resorption.
- × Internal root resorption in the apical third of the root.
- × Radicular cyst, dentigerous/follicular cyst in association with the primary tooth.
- × Inter-radicular radiolucency that communicates with the gingival sulcus.

Partial Pulpectomy

This procedure is indicated in primary teeth when:

- 1) Coronal pulp tissue and the tissue entering the pulp canals are vital but show clinical evidence of hyperemia.
- 2) The tooth may or may not have a history of painful pulpitis, but the contents of the root canals should show evidence of necrosis (suppuration).
- 3) There is no radiographic evidence of a thickened periodontal ligament or of radicular disease.

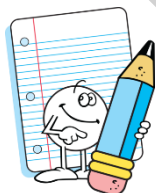
If any of these conditions are not present, a complete pulpectomy or an extraction should be performed.

The clinical procedure

The partial pulpectomy technique may be completed in one appointment that involves the removal of the coronal pulp as for the pulpotomy technique. Removal of the pulp filaments from the root canals done with a fine barbed broach; there will be considerable hemorrhage at this point. A Hedstrom file will be helpful in the removal of remnants of the pulp tissue. The file removes tissue only as it is withdrawn and penetrates readily with a minimum of resistance.

Care should be taken to avoid penetrating the apex of the tooth. After removal of the pulp tissue from the canals, a syringe is used to irrigate them with 3% hydrogen peroxide followed by sodium hypochlorite. Then dryness of the canals should be done with sterile paper points. Hemorrhage should be controlled and the canals should be dry.

Thin mix of zinc oxide-eugenol paste may be prepared, and paper points covered with the material can be used to coat the root canal walls. Small files may be used to file the paste into the walls. The excess thin paste may be removed with paper points and Hedstrom files.

**Notes:**

Zinc oxide–eugenol paste has been viewed as the traditional root canal filling material for primary teeth.



Results from multiple studies suggest that KRI paste may be preferable. The primary components of KRI paste are zinc oxide and iodoform. The

main advantages of KRI paste over zinc oxide–eugenol paste are that KRI paste resorbs in synchrony with primary roots and is less irritating to surrounding tissues if a root is inadvertently overfilled.



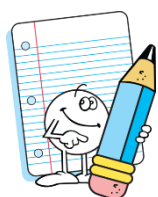
Another popular root canal filling material for primary teeth is Vitapex. The primary components of Vitapex are calcium hydroxide and iodoform. Vitapex may be at least as effective as KRI paste.

Complete Pulpectomy

Clinical technique is similar to partial pulpectomy but not all the procedures are done on the first visit.

On the first visit, the pulp is extirpated and all the contents of the pulp chamber and debris from the occlusal third of the canals should be removed, with care taken to avoid forcing any of the infected contents through the apical foramen. Then canals are irrigated, dried and a moistened pellet of camphorated monochlorophenol (CMCP) or 1:5 concentration of Buckley's formocresol, with excess moisture blotted, should be placed in the pulp chamber. The chamber may be sealed with zinc oxide-eugenol and the tooth is temporarily restored.

On the second visit, several days later, the tooth should be isolated with a rubber dam and the treatment pellet removed. If the tooth has remained asymptomatic during the interval, the remaining contents of the canals should be removed and the canals are enlarged. If all the symptoms have subsided, the tooth is obturated and permanently restored.



Notes:



If the tooth has been painful and there is evidence of moisture in the canals after the removal of the treatment pellet, again mechanical cleaning of the canals should be done followed by irrigation then dryness and the treatment should be repeated.



Obturation should postponed until the symptoms regresses.



Systemic antibiotics are advised if cellulitis is present.



The signs and symptoms at each visit will determined the number of appointments, timing and extent of instrumentation.