Pulpotomy vs Pulpectomy Techniques: When and What to do?

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Abstract

Pulpotomy and pulpectomy are two modes of treatment designed to preserve deciduous teeth in the dental arch. A tooth is a natural space maintainer which maintains the integrity of the dental arch. A tooth also helps in maintaining esthetics, phonetics and helps in the chewing of food. The loss of deciduous teeth due to caries, infection or trauma can irreversibly affect the integrity of the dental arch[1]. Most of the time premature loss of deciduous teeth occurs due to infection of the pulp. Pulpotomy was designed to treat teeth which showed symptoms of reversible pulpitis where only the coronal portion of the pulp is involved[2]. On the other hand pulpectomy is done in deciduous teeth where the whole pulp including the coronal and radicular portion has become inflamed or in cases of non vital deciduous teeth. In choosing whethee to do a pulpotomy or a pulpectomy,several factors come into play including the vitality of the pulp, the portion of the pulp involved,necrotic pulp, the state of the supporting tissue(periodontal ligament and alveolar bone), the amount of root remaining etc,After going through all these factors a particular mode of treatment (pulpotomy or pulpectomy) is chosen to treat the deciduous teeth which are pulpally involved[3].

This articlee is an attempt to state the differences between pulpotomy and pulpectomy and also how to diagnose the symptoms of reversible and irreversible pulpitis and when to perform a pulpotomy or a pulpectomy.

Introduction

Pulpotomy vs Pulpectomy

Pulpotomy is defined as the removal of the coronal portion of the pulp followwd by the application of medicaments in order to preserve the vitality of the radicular pulp. Pulpotomy is generally done in case of reversible pulpitis whereonly the coronal portion of the pulp is involved and the infection has not spread to the radicular pulp and the investing structure of the tooth[4].

Teeth with reversible pulpitis requiring pulpotomy generally has the following symptoms[5].

1) Pain is felt only when a stimulus (heat, cold or sweet food) is applied to the teeth and the pain disappears as soon as the stimulus is removed.

2) There is short and sharp pain but the pain is never spontaneous.

Materials used in pulpotomy are formocresol, gluteraldehyde, ferric sulphate, bone morphogenic protein and MTA.

Pulpectomy on the other hand is defined as the complete removal of the pulp including the coronal and radicular portion of the pulp. It is done when a tooth is suffering from irreversible pulpitis where the infection has spread to the radicular pulp and the supporting structure of the tooth and in cases where the tooth is non vital.

The symptoms of irreversible pulpitis can be summarised as

1) Lingering pain induced by thermal stimuli

2) Spontaneous pain

3) Pain continues for minutes to hours even when the stimuli is removed.

4) Pain increases on bending or lying down.

Materials used in Pulpectomy are zinc oxide eugenol, iodoform. Maisto's paste etc.

Difficulties in performing pulp tests in pediatric patients.

Diagnostic tests that are used in conventional endodontic therapy are of little help in case of deciduous teeth. Pediatric patients generally have a low threshold of pain in comparison to adults and hence they can not comprehend subjective symptoms to a stimuli. Since pulp vitality tests require the symptoms to a stimulation[6]. The results can be exaggerated due to failure of primary teeth to respond. In primary teeth due to the lack of development of the plexus of Raschkow in the pulp dentin complex, pulp vitality tests like thermal and electric pulp testing are irrelevant. Hence pulp tests should be used as an adjuvant to other clinical diagnostic tools to asses pulp vitality in deciduous teeth[7].

Technique of pulpotomy

In performing a pulpotomy, the tooth is first anaesthesised and isolated using a rubber dam. All caries is than removed using a high speed straight fissure bur. The dentinal roof is than removed using a round bur. A spoon excavator is than used to amputate the coronal pulp. The pulp chamber is than cleaned with saline and a cotton pellet is placed over the pulp stump to achieve hameostasis. A cotton pellet with formocresol is placed over the pulp stump for 4 minutes to fix the tissue. Zinc oxide eugenol cement is placed in the pulp chamber and the tooth is restored with a stainless steel crown. In cases where haemostasis can not be achieved after the amputation of the coronal pulp it is better to do a pulpectomy. Excessive hemorrhage after coronal pulp amputation might be due to thr spread of infection into the radicular pulp[8].

Pulpotomy is generally indicated in teeth with large carious lesion but without radicular pulpitis, when haemostasis can be achieved after coronal pulp amputation, no history of spontaneous pain, no loss of interradicular bone and presence of two third of root length. It is contraindicated in case of spontaneous pain, non restorable tooth, root resorption, presence of abscess or fistula and interradicular bone loss.

The complications of pulpotomy may include pain, fracture of tooth, internal resorption and discoloration of tooth.

Technique of performing pulpectomy

In pulpectomy, the tooth is anaesthesised and isolated and the pulp chamber is deroofed with a round bur. All the coronal and radicular pulp is removed with a H file and the root canals are filed to remove infectious dentin and irrigated with saline. The canals are than filled with a resorbable paste like zinc oxide eugenol to seal off the canals from infection. The tooth is than restored using a stainless steel crown[9].

A pulpectomy is generally done in cases where there is irreversible pulpitis of the tooth, where the inflammation has spread to the radicular pulp and the supporting tissues of the tooth as well as in non vital primary teeth. Pulpectomy is indicated in cases of teeth indicated for pulpotomy that shows excessive hemorrhage, in primary teeth with abscess and fistula, teeth with minimum root resorption and adequate bony support. It is contraindicated in cases of external root resorption, teeth with radicular cysts and inter radicular bone loss. Complications of pulpectomy include pain., internal and external resorption and tooth fracture[10].

Conclusion

Pulpotomy and pulpectomy are common dental treatment procedures performed by a pediatric dentist. The most important factor in performing a proper pulpotomy or pulpectomy is correct diagnosis of reversible or irreversible pulpitis. As was wriiten in this article, it is difficult to test the state of the pulp in children. Hence pulp tests along with intra oral examination and other diagnostic tools like pulp oximetrt are essential to arrive at a correct diagnosis. A pulpotomy should be done in cases of reversible pulpitis where the radicular pulp is not involved and a pulpectomy should be done in cases of irreversible pulpitis with radicular pulp involvement and in case of non vital teeth. Both pulpotomy and pulpectomy are safe procedures but sometimes may present with complications like pain, internal and external resorptin and tooth fracture.

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