CASE REPORT

Pulpectomy in Second Primary Molar With Missing Successor: A Gutta-Percha Based Approach

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Abstract

The most common congenitally missing tooth after the third molar is second premolar. Therefore, endodontic treatment of second primary molars is crucial for a tooth that lasts longer. A conservative treatment option for severe caries, persistent inflammation, or pulp necrosis is a pulpectomy of the primary teeth. In the primary dentition, the main goals of pulp therapy are to keep the tooth pathologically healthy, preserve its function as a vital component of the primary dentition, and eradicate infection and chronic inflammation while relieving the pain that an inflamed pulp causes. In case of missing successor is important to preserve the predecessor to maintain the space and arch length as primary tooth is the best space maintainer. Therefore, pulpectomy in such cases is done using non-resorbable material like gutta percha.

This case report describes a 4 year old boy who had pain in primary second molar tooth and there was congenitally missing second premolar. So, to preserve the tooth in the arch obturation was done with gutta percha.

Keywords: pulpectomy, congenitally missing successor, primary molar, gutta percha

INTRODUCTION

The highest incidence (5%) of congenitally missing tooth is of second premolar after the third molar (22%)[1]. Its absence has been documented to occur in 2.4 to 4.3 percent of various populations[2]. In such cases there are two treatment options: either extracting primary second molar and allowing the permanent first molar to move mesially and close the space or to preserve primary molar until the patient is old enough for the implant or any prosthetic solution[3]. So, to preserve a primary tooth, pulpotomy or pulpectomy procedures are performed depending on the state of pulpal involvement[4].

In puplotomy, infected pulp is removed from the pulp chamber making it a less invasive procedure whereas pulpectomy is a more complex procedure that involves removing all of the infected tissue from the pulp chamber, root canals, and the root of the affected tooth.

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If there are no symptoms of a fistula, bone resorption, or an expansion of the periodontal ligament space, and the tooth is immobile and still functions without pain, discomfort, or infection, the procedure is deemed successful. Pulpectomy is contraindicated in teeth with non-restorable crowns, decreased bone support with tooth mobility, perforations, internal or external root resorption, radiographic indications of follicle involvement, and patients with compromised health[5,6].

There are various root canal filling materials for primary teeth which include: zinc oxide eugenol (ZOE), Maisto paste, Kri paste, Endoflas, Vitapex and more recently Mineral trioxide aggregate and Calcium enriched mixture[7].

Several studies suggest that second primary molars with congenitally missing successors could be treated endodontically using Gutta-percha obturation[8]. However, creating curved and delicate primary molar roots that reach the right size for the master apical file comes with inherent limitations. As a result, achieving satisfactory obturation may prove to be challenging.

This case report presents a pulpectomy case where there was no permanent successor tooth in relation to left primary second molar.

CASE REPORT

A 4 year old male patient reported to the Department of Pediatric and Preventive Dentistry of our institute with a chief complaint of pain in lower left back tooth region since 3 days. Pain was localized, spontaneous and mild in intensity, dull and throbbing in nature , which aggravated on mastication. On clinical examination, it was observed that left primary second molar was decayed *(Fig.1)* and it

showed positive reaction to percussion testing. Radiographic examination revealed caries approaching pulp in relation to 75 and there was missing successional premolar *(Fig.2)*.

Fig. 1 & 2. Pre-operative intraoral photograph and IOPAR irt 75

Based on history, clinical and radiographic examination, the diagnosis made was Chronic irreversible pulpitis irt 75. Treatment plan made was pulpectomy with gutta-percha followed by stainless steel crown.

All carious tissues were removed followed by an access opening in to the pulp chamber under a local anesthesia. The inflamed and necrotic tissue of the pulp was then removed. Working length of the canals was determined using 15-K file followed by chemo-mechanical preparation using series of 21 mm K type endodontic files. Canals were prepared till 35-K file. Root canals were then irrigated with sodium hypochlorite and saline and dried using fine paper point according to the canal's master file size. Radiograph of master cone was taken *(Fig.3)*. Each canal was then obturated with gutta-percha *(Fig.4)* followed by type IX glass ionomer cement restoration and stainless steel crown *(Fig5.)*.

Fig. 3. Master cone Radiograph

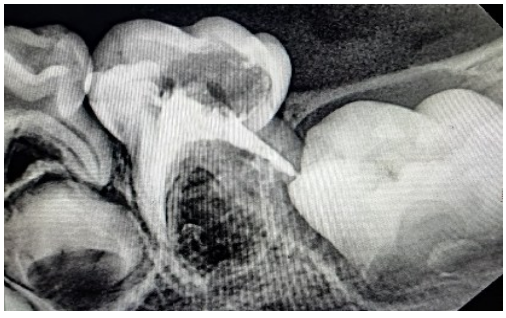

Fig. 4. Obturation with gutta-percha

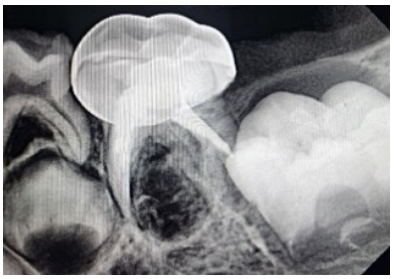

Fig. 5. Stainless steel crown cemented

It was challenging to do obturation in this patient as he was uncooperative (Score 2 according to Frankl behaviour rating scale i.e., he showed slight negative attitude).

Patient was recalled after 2 weeks for follow-up and there was no clinical or radiographic sign and symptoms of any problem reported.

DISCUSSION

In order of frequency, lateral incisors, second premolars, and third molars are the most frequently congenitally absent permanent teeth[9]. It can be challenging for the dentist to preserve the primary tooth when the permanent replacement is congenitally absent.

It is crucial to keep primary teeth that lack their permanent successors but have a complete crown and root structure. By doing this, any discrepancy in the arch's length would be successfully avoided, the gap would be preserved, and no orthodontic or prosthetic therapy would be required[10].

Another case reported in 2010 by *Tunc* and *Bayrak* chose to retain the mandibular second primary molar for an extended period of time due to the absence of the subsequent premolar and they used White mineral trioxide aggregate (WMTA) to perform pulpectomy in that case[11].

Numerous investigations have been carried out to assess different materials, such as the conventional Gutta Percha[8]. Implementing long-lasting treatment in these teeth will decrease the likelihood of resorption in the near future. Preserving the area until the patient is capable of undergoing more complex procedures, like implants and prostheses, is one of the main goals of this.

On average, the deciduous molars without the second premolar undergo physiological resorption at age 22, which is ten years later than the typical exfoliation time estimate. Thus, this is regarded as the ideal time to replace an implant[3].

The use of pure ZOE pastes as the preferred material for primary tooth root fillings has long been recommended in order to increase the likelihood that the material will be absorbed by the patient's defence mechanism after physiologic root resorption[12]. But in cases where there is missing successor, obturating material must be biocompatible and non-resorbable therefore; gutta-percha, mineral trioxide aggregate and biodentin are the material of choice for retained primary teeth lacking successors[13].

When *Ansari G* and *Mirkarimi* followed up on a case of gutta-percha root filling in a second primary molar with no successor, they found that using gutta-percha-filler could keep those primary teeth healthy and intact[14].

O' Sulliavan SM et al. obturated retained primary mandibular second molar with MTA in 20-year-old male patient. Four-month follow-up radiograph reveals decrease in size of radiolucency at apex[15].

To create better endodontic obturating materials that satisfy biological requirements and guarantee a consistent long-term therapeutic result, researchers are constantly working to advance the field. Gutta percha is the most popular option among them because it has been used extensively for a long time. Additionally, it has demonstrated efficacy in various obturation techniques while retaining its fundamental qualities as a filling material for primary and permanent teeth.

However, many research studies have used traditional grey and white MTA which also showed positive results when examined the teeth radiographically.

CONCLUSION

The present case demonstrates the successful endodontic management of a second primary molar with a necrotic pulp and a congenitally missing permanent successor. In such scenarios, the long-term retention of the primary tooth becomes essential to preserve occlusal function, arch length, and prevent malocclusion. Although gutta-percha is not the material of choice for primary teeth due to its limited resorbability, its use was justified in this case due to the absence of a permanent successor and the need for a long-lasting obturation material.

This case highlighted the obturation of primary tooth with missing successor using gutta-percha to preserve the tooth for longer duration. There was no post-operative complications reported by the patient.

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