Unusual Root Resorption of Endodontically Treated Primary Molar with Missing Succedanous Permanent Premolar: A Rare Case Report

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ABSTRACT

Root resorption is a normal physiological process in children. The etiologic factors are uncertain, diagnoses are educated guesses and often the chosen treatment does not prevent the rapid resorption of the calcified dental tissues. In this case report, a four and a half-year-old male child reported to the Department of Pedodontics and Preventive Dentistry with a chief complaint of decayed teeth in lower left back region since six months. Radiographic examination revealed the missing succedaneous tooth. So conventional pulpectomy with gutta percha was performed to preserve the primary tooth as long as possible. On follow-up complete root resorption was seen. This case report documents unusual root resorption in an endodontically treated primary molar with missing succedaneous tooth.

KEYWORDS: Root resorption, Missing succedaneous tooth, Distal shoe

INTRODUCTION

Physiological root resorption is a known phenomenon for primary teeth. The etiologic factors are uncertain. The most common cause of root resorption is the pulpal infection. Mechanical or chemical injury to the pulpal tissue and stimulation of pulpal tissue by infection or pressure are the prerequisite for the initiation of root resorption. The selection of proper treatment is related to the various stimulation factors such as infection from pulp or periodontium and pressure from orthodontic forces, impacted tooth or tumor.[1] This case report documents unusual rapid root resorption of lower left second primary molar with missing succedaneous tooth after pulpectomy.

CASE REPORT

A four and half-year-old male child reported to the Department of Pedodontics And Preventive Dentistry with decayed teeth in lower left back region since six months. After clinical and radiographic examination, (Fig. 1& 2) chronic irreversible pulpitis was diagnosed for both mandibular right and left primary second molar, so pulpectomy was advised for both the teeth. The further radiographic examination also revealed the unilateral agenesis of the mandibular left permanent second premolar. Pulpectomies of both mandibular right and left second primary molars were done. As lower left second premolar was missing, mandibular left second deciduous molar (MLSDM) was obturated with gutta percha (Fig. 3). The patient reported back after six months with a complaint of mobility in MLSDM.

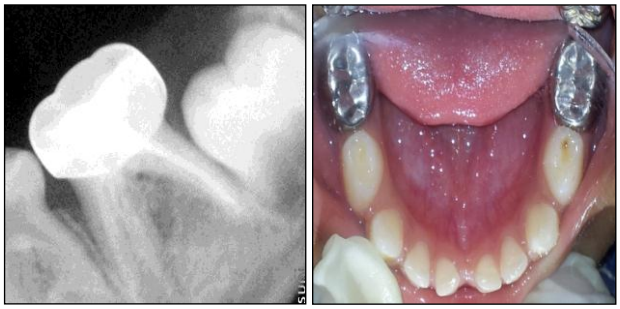
Preoperative mandibular view (Fig. 1)

Radiovisiography of MLSDM revealed complete resorption of the roots (Fig. 4). Bone around the gutta-percha points was normal without any radiographic change (Fig. 2). Root resorption in this case was followed by normal bone deposition (replacement resorption). It was planned to extract the tooth under local anesthesia (Fig. 5). Gutta percha cones were seen projecting out from the extracted tooth with roots completely resorbed

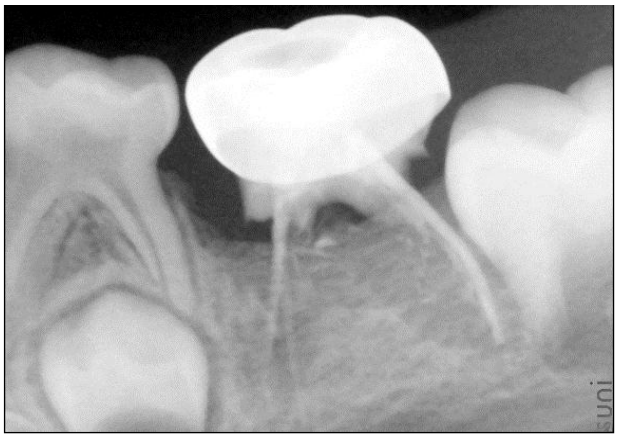
How to cite this article:
Bhuria P, Khinda VIS, Brar GS, Bajaj N. Treated Primary Molar with Missing Succedanous Permanent Premolar: A Rare Case Report. Int J Dent Med Res 2015;1(6):109-112.

(Fig. 5). The extraction site healed uneventfully (Fig. 6). Distal shoe space maintainer was planned and delivered soon after the extraction of MLSDM to guide the first permanent molar eruption (Fig. 7,8,9). On follow up, first permanent molar was successfully guided into occlusion (Fig. 10,11).

Preoperative mandibular view (Fig. 1)



(Fig. 3) Postoperative 6 months back after completing the pupectomy followed by stainless steel crown wrt 75



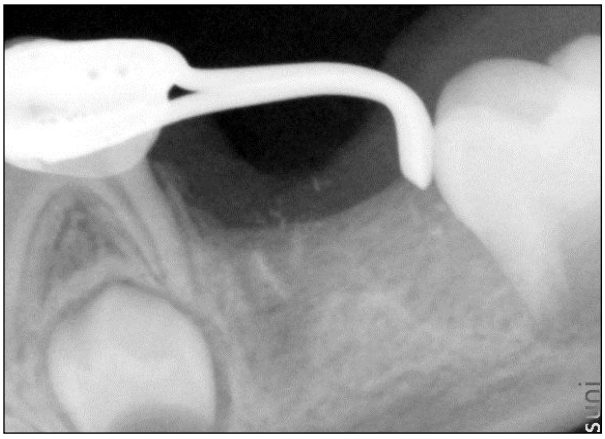
Radiograph showing root resorption wrt 75 on follow up of 6 months (Fig. 4)

Extracted 75 with extruded Gutta percha (Fig. no.5)

Healing socket after extraction wrt 75 (Fig. 6)

Distal shoe space maintainer delivered (Fig. 7)

Postoperative occlusal view (Fig. 8)



Radiograph showing distal shoe space maintainer contacting the mesial surface of erupting first mandibular permanent molar (Fig. no. 9)

Follow up (Fig. 10) after 6 months

Occlusion at 6 months recall visit (Fig. 11)

DISCUSSION

One of the most common developmental dental defects in humans is tooth agenesis. Tooth agenesis is generally seen in permanent dentition with an incidence 3.4% to 10.1% and mandibular second premolar is the commonly missing permanent tooth with incidence being 3.4%.[2,3]

Stellate reticulum and dental follicle plays a vital role in the regulation of root resorption and it is done by the secretion of stimulatory molecules, i.e. cytokines and transcription.[4] Degradation of PDL precedes root resorption and specifically removal of collagen fibers of PDL is the triggering factor for the initiation root resorption .[5] PDL, odontoclast and odontoblast play an important role in the normal and pathologic bone and connective tissue turnover, as well as physiological root resorption process.[6]

There are numerous factors on which the choice of treatment for congenitally missing mandibular second premolar depends. They are patient's age, the development stage of adjacent teeth and the root resorption and infra-occlusion of the primary predecessor.[7,8] Options include maintaining the primary tooth or extracting it and allowing the space to close spontaneously, implant replacement, auto-transplantation, prosthetic replacement and orthodontic space closure.[7,8]

Implants are contraindicated in growing patients, as they impede the normal alveolar growth process.[9] The placement of an implant should be deferred until puberty or after the occurrence of the growth spurt of the child.[10] Conventional fixed partial dentures are not advocated in young patients since preparation of the abutment teeth may need to be delayed due to high pulp horns.[7,8]

Other treatment options are extraction and spontaneous space closure. The timing of the extraction is critical, as early removal of the second primary molar can have deleterious effects on dental arches which include arch length reduction, malalignment of adjacent teeth, alveolar bone resorption and extrusion of the antagonist tooth. So future malocclusion can be prevented by maintaining the primary molar.[10]

In the present case, it was decided to maintain the tooth for as long as possible before inserting an implant which was based on the young age of the patient, absence of any malocclusion or arch-length deficiency, and unilaterally missing mandibular left second premolar. For this reason, a conventional pulpectomy was performed, and regular follow-up appointments were scheduled to reevaluate for pulpal pathology, ankylosis, and infra-occlusion. On follow-up after 6 months, radiovisiography showed complete resorption of the roots with gutta-percha cones embedded in the bone.

In this case the canals were obturated with gutta-percha followed by reconstruction of the crown as being used by Camp et al.[11]. However, primary molar roots have various limitations. It is difficult to prepare to a proper master apical file size in case of curved, fragile primary molar roots. A recent study by O'Sullivan[12] recommended the use of mineral trioxide aggregate (MTA) for canal obturation in retained primary teeth. However, no long-term results were reported.

Conventionally resorbable pastes such as zinc oxide eugenol, iodoform, and calcium hydroxide can be used for primary teeth pulpectomies. In the case of primary teeth with missing permanent successors, pulpectomy treatment is similar to permanent teeth i.e. obturation with non-resorbable material. In a study, obturation with gutta-percha provided better apical seal than MTA.[13]

Various factors on which endodontic prognosis depends on a proper diagnosis, residual pulp space infection, under or over obturation, procedural errors and quality of the permanent restoration. In the present case, the mandibular left second deciduous molar was retained for only six months post therapy, with clinical signs or symptoms of obvious endodontic failure (i.e. mobility, pain and premature exfoliation). After 6 months of follow-up, radiographic examination showed complete root resorption. This finding suggests pathologic root resorption. Root resorption in this case, can be attributed to any of the above-mentioned factors, especially furcal infection. The abundance of accessory canals in the furcation area often leads to the endodontic failure. The presence of pre-operative infection (apical periodontitis)

was recently defined as a key confounding factor in the endodontic treatment outcome.[14]

CONCLUSION

Endodontic outcomes depend upon number of factors such as preoperative infection, extruding sealer (ZOE), procedural errors and micro leakage. Identification of such stimulation factor of root resorption is useful in providing proper treatment by removing the etiological factor.

ACKNOWLEDGEMENT

I would like to thank Dr. Heena for her unconditional support.

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Source of Support: Nil
Conflict of Interest: Nil