

Hemisection of Primary Mandibular Second Molar as natural space maintainer - An Innovative method

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Type of Publication: Case Report

Conflicts of Interest: Nil

Aims: Space maintenance by Hemisection of Primary Mandibular Second Molar with severe pathological root resorption followed by modified stainless steel crown (SSC) restoration.

Background: As primary teeth serve as best space maintainers for permanent dentition, every possible effort are to be made to retain primary teeth till its normal exfoliation time.

Case description: The current case report describes management of carious Primary Mandibular Second Molar with pathological mesial root resorption by coronal Hemisection followed by modified SSC.

Conclusions: Hemisection with modified SSC is an alternative viable physiological treatment option than extraction in primary molars with pathological root resorption that acts as fixed functional space

maintainers. However, more researches still need to be performed to consolidate the technique.

Clinical significance: Preserving the full width of primary teeth in the the arch with this Hemisection and modified SSC technique till attainment of their normal time of exfoliation prevents arch circumference inadequacy and aids in normal physiological eruption process of successors teeth.

Keywords: Stainless steel crown (SSC), Hemisection, Pathological root resorption

Introduction

The primary dentition plays a very important role in the child’s growth and development. The primary teeth not only help in speech, mastication and appearance but also guide the eruption of permanent teeth [1]. Exfoliation of primary teeth and eruption of permanent teeth is a normal physiological process [2]. Any deviation in this

physiological process may occur due to premature loss of primary teeth leading to crowding along with short arch length. Further, arch length deficiency can cause crowding, rotations, ectopic eruption, crossbite, excessive overjet, excessive overbite, impaction of permanent teeth, super-eruption of opposing teeth *etc.*, and unfavourable molar relationships [3]. The concept of space loss resulting from premature loss of primary teeth was described by Davenport in 1887 [4]. The best way to avoid these problems is to preserve the primary teeth in the arch till attainment of their normal time of exfoliation. Hence it is rightly quoted that primary teeth serve as best space maintainers for permanent dentition [5].

Hemisection is the surgical separation of a multirooted tooth, especially a mandibular permanent molar through the furcation in such a way that a root and the associated portion of the crown may be removed [6]. The treatment goal is the preservation of remaining tooth structure and restoration of the function.

Hemisection in primary teeth is not a common procedure. The purpose of this case report is to discuss an alternative treatment option for space maintenance by Hemisection of Primary Mandibular Second molar with severe pathological mesial root resorption followed by modified stainless steel crown.

Case description

7 yr 10 months old boy reported with pain and food lodgement in lower right back region. On intra oral examination revealed deep occlusal caries involving mesial half of 85 and disto Occlusal caries in 84 near to pulp with no abnormal mobility of both the teeth. Patient was having no relevant past medical history and dental history. On radiographic examination pathological mesial root resorption was there w. r to 85. Only 2-3 mm root stumps of mesial root close to 45 were present.

Treatment

Initially extraction of 85 and bilateral space maintainer was planned, but both the teeth were firm with no abnormal mobility. Therefore, after careful evaluation of all possible outcomes it was decided to save 85 by pulpectomy of distal root & coronal Hemisection followed by modified SSC. Parental informed consent was obtained. For 84 planned to place modified SSC (Like Hall technique). Local anaesthesia was administered and isolation was achieved through the rubber dam and saliva ejectors. Pulpectomy procedure was carried out w. r to 85. Coronal Hemisection done and POR done with Type IX GIC. Mesial root stumps were left untreated as they were close to 45. Patient was advised proper antibiotics and analgesics. After a week caries excavation was done w. r to 84. As there was no clinical pulp exposure seen, a modified SSC cemented over 84.SSC for 85 was selected as per mesio-distal diameter. Rubber base impression was taken and a working cast generated at this appointment. Some modifications of 85 SSC were done on cast and 85 crown cemented after 2weeks of pulpectomy. Post operative instructions for using NS Proxa brush to clean food particles underneath the crowns and gargling after each meal.

Outcome and follow-up

The restorations were evaluated after 3 months. The gingival health was visually and clinically inspected with explorer at 3 month follow up. There was no pain and mobility. Both crowns were intact no swelling, no food lodgement under the crowns. Radiographically mesial root stumps of 85 were still there. Patient didn't come for 6 months follow up which might be due to no discomfort. After 11 months patient appeared suddenly. On radiograph complete distal root resorption of 85 seen. Type IX GIC under 85 SSC still intact. Then

parents were asked to report after 6 months. Suddenly after 2 years of treatment patient reported to clinic with one of the exfoliated crowns i.e 84 .Radiographs were taken that showed erupting 44, 85 SSC still in place. At the same time left side IOPA was taken to see the position of 35 and surprisingly both teeth were same phase of eruptions. Finally, extraction of 85 was done.

Discussion

One of the greatest challenges of pediatric dentistry is maintaining the primary teeth in the arch until their normal exfoliation time. Teeth with severe decay and traumatized teeth with irreversible pulp changes need a radical endodontic treatment to continue their functions such as esthetics, phonetic, chewing, and maintenance of the arch perimeter [7].

In this case report apart from endodontic treatment some modifications were done in the tooth and associated crowns. The Hemisection procedure performed in this case report was unlike that described by Sanders [8]. As mesial root stumps of 85 were close to 45 so it was decided not to extract them to avoid iatrogenic trauma to developing tooth germ. Both the stain less steel crowns were modified. Distal half of SSC of 84 was pinched with crown contouring plier to form proximal rest seat area (like in Cast Partial Denture) and then cemented. For 85 two modifications were done. First modification was soldering a mesial projection from 85 SSC to fit in to the distal rest seat area of 84 SSC. Advantage of this modification were it prevented the turning effect on 85 i.e. tipping and most importantly if any one of them exfoliates earlier that won't affect the other as both crowns are separate. Second modification of 85 SSC was mesial crown margin crimped severely to retain type IX GIC in mesial half of crown (i.e., to fill hemi sectioned coronal part) and mesioocclusal inner wall of SSC roughened to increase retention of GIC. It prevented

food lodgement under SSC and smooth regular surface for gingival tissue. If extraction of one or both teeth had become necessary, arch circumference maintenance would have been required. Early intervention in our case not only prevented arch length loss, also assured a normal physiological eruption pathway and minimised detrimental effects on the developing occlusion.

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Legend Figures



Figure 1: (A) Pathological mesial root resorption of 85, DO caries near to pulp 84



Figure 2: (A, B) Pulpectomy of 85, 2 (C) Coronal Hemisection of 85 and Type IX GIC core



Figure 4: (A, B) Modified SSC on 84



Figure 5: (A) 2 weeks after Pulpectomy modified SSC for 85 ,4 (B) SSC cemented on 85 ,4(C) 3 months follow up

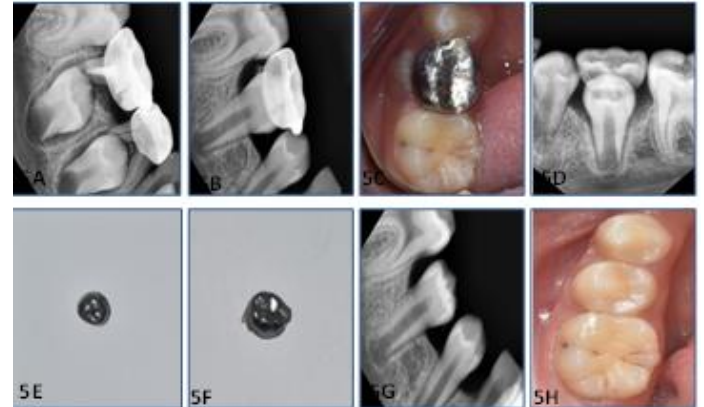


Figure 5: (A) 11 months follow up, 5 (B, C) 23 months follow up 85, 5(D) 23 months follow up 75, 5(E) Exfoliated 84 with SSC,5(F) Extracted 85 with SSC,5(G) 1 Week after extraction of 85, 5(H) 6 months follow up after extraction of 85