Aesthetic Rehabilitation of Maxillary Primary Anterior Teeth with Early Childhood Caries – Report of Three Different Cases

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Abstract

It is a great challenge for Pediatric Dentists to restore and to aesthetically rehabilitate a pre-schooler, who has lost their anterior teeth subsequent to early childhood caries or extensive dental trauma. This paper discusses case reports of anterior aesthetic rehabilitation of upper primary incisors in three different methods taking into account the different aspects of the treatment modalities. The different methods employed were post and core restoration with direct resin composite build up, restoration with strip crowns and rehabilitation with fixed functional space maintainers replacing the crowns of upper primary central and lateral incisors.

Keywords: aesthetic rehabilitation, primary anteriors, post and core, strip crowns, fixed space maintainers


1. Introduction

Dental caries has been reported since prehistoric times and the present dietary course has contributed substantially to the increased prevalence of this disease worldwide [1]. The most common cause of the structural damage of the anterior teeth is the early childhood caries and dental trauma. ECC is defined as “the presence of one or more decayed (non-cavitated or cavitated lesions), missing teeth (due to caries), or filled tooth surfaces in any primary tooth in a child 72 of months age or younger. In the initial phase it is found on either the labial or lingual surfaces of the teeth and the primary maxillary incisors are generally affected earlier. ECC starts as a dull, white demineralized enamel that quickly advances to obvious decay along the gingival margin. S. mutans and Streptococcus sobrinus are the main cariogenic micro-organisms responsible for the ECC. Most of the studies have shown significant correlation between ECC and prolonged bottle-feeding at bed time and is aggravated by less saliva production at night [2]. It leads to compromise in aesthetics, mastication, phonetics and negative impact on psychological and social well-being of the child [3]. Depending upon the amount of tooth loss they are treated either intracoronally or full-coronally. The various full coronal restorative management include strip crowns, art glass crowns, veneered stainless steel crowns, prefabricated zirconia and polycarbonate crowns [4].

2. Case Reports

2.1. Case 1

Figure 1. intra-oral, preoperative  
Figure 2. Pre-operative IOPAR

Figure 3. IOPAR after pulpectomy
A three year old boy reported with his mother to our department complaining of decayed upper front teeth since 9 months. There was no significant Medical history. No remarkable extra oral findings. On examination Intra oral findings were as follows: Caries was severe, extending almost up to the cervical margins with pulpal exposure in the anterior teeth nos # 51, 52, 61 and 62. Tongue thrusting habit was noticed during functional movements due to the fractured crown of the anterior teeth. Intra oral periapical radiographs [IOPA] of the involved maxillary anterior teeth has revealed the caries extension into the pulp space but with no evidence of periradicular abnormalities or radiolucency, but with widening of the lamina dura of all the maxillary incisors. Root canals were accessed, debrided, canal preparation was done, canals irrigated and obturation was done with zinc oxide eugenol obturating material. At the next appointment the zinc oxide eugenol was removed, from the coronal 3mm of the root portion, for accepting the post. Endodontic posts were made with stainless steel wire in the figure of eight morphology. The post was cemented with luting cement. Coronal part of the individual teeth was built up with light cured composite restorative material.

2.2. Case -2

A three and a half year old boy reported to our department with his parents complaining of decay in relation to upper front teeth since 6 months without any history of pain. Aesthetics was their primary concern. There was no relevant Medical history. On examination the Intra oral finding was carious involvement of the maxillary deciduous anterior teeth extending to dentin but no pulpal involvement in tooth nos # 51, 52, 61, 62. The IOPA of these teeth showed no pulpal involvement.

Treatments were initiated with restoration of 51, 52, 61, 62 using Glass Ionomer Cement [Fuji 9 extra]. At the next appointment strip crowns or celluloid crowns were selected for the teeth involved according to the available mesio-distal width. The teeth were prepared for the crowns. The celluloid crowns were modified for proper morphology and size that fits to the individual teeth and holes were given to vent out the excess composite material. The teeth were then etched and bonding agents applied and light cured.

Then aesthetic rehabilitation of these teeth #51, 52, 61, 62 was carried out. Composite restorative material was filled into the celluloid crowns, seated onto the individual teeth, excess material was removed and polymerization was done from labial, incisal and palatal sides. Later the celluloid forms were removed by cutting the crowns from the palatal aspect, using a scalpel. Occlusal adjustments and finishing of gingival margins were done using flame shaped and round composite finishing burs.
2.3. Case 3

A three year old girl reported to our department with her mother complaining of pain while eating both at front and back teeth since 5 days. No noticeable extra oral findings were seen. Intra oral findings were grossly decayed maxillary anterior teeth with the loss of crown structure from the cervical margins on # 51, 52, 61,62. All of them being pulpally involved with history of periapical abscess which subsided on medication.

Figure 13. Intra-oral, preoperative

Figure 14. Intra-oral, preoperative, lower arch

The IOPA of the concerned teeth were correlating well with the clinical findings with the presence of periapical radiolucency.

Figure 15. Intra-oral, preoperative, upper arch

Pulpectomies were performed for teeth # 51,52,61,62 and the canals were accessed, debrided, irrigated and obturated with zinc oxide eugenol obturating material.

Figure 16. Post-pulpectomy IOPAR

After pulpectomy procedure, the canal orifices were permanently sealed with Glass Ionomer Cement [Fuji 9 extra] and since aesthetics was a major concern both for the child and parent, it was decided to replace the coronal part with fixed functional space maintainer. Impressions were made with alginate and stone model of the upper and lower arch were made. Stainless steel bands were adapted on the maxillary primary second molars. 19 gauge SS Wire was bend to conform to the upper arch and was soldered on the palatal aspect of the bands. The four anterior teeth with acrylic was bonded to the palatal arch wire. The whole unit was then cemented into place. [Figure 17, Figure 18]

Figure 17. Post-operative, intra-oral

Figure 18. Post-operative, extra-oral

3. Discussion

Restoration of primary anterior teeth is always challenging to the clinician because of many reasons including overall smaller size of the crowns, the nature and the type of the spread of the decay, compromised patient cooperation, the young age at which the treatment was often needed, poor compliance with intra operative and post-operative care instructions. The presence of aprismatic enamel on primary teeth surface is another challenge which compromises adhesive bonding restorative leading to frequent failures. The cases presented here were all having grossly decayed anterior teeth. In the first case there was minimal tooth structure to support any restorative build up after pulpectomy. So a post and core build up was carried out for retention of the final restorative. The level of the post was kept untill the crest of the alveolar bone, so that, it would not interfere with the erupting succedaneous teeth. The level of post insertion in the canal up to the crest of alveolar bone was verified radiographically pre-operatively. Different types of posts such as threaded posts, nickel-chromium cast post, preformed and cast metal post, alpha or omega shaped orthodontic wires, [5] stainless steel prefabricated posts, [6] natural teeth from a tooth bank, [7] and Fiber posts have been utilized to retain the restorative [4].

In the second case notwithstanding, the multisurface involvement, the caries was not extending into the pulp and a considerable amount of tooth structure was present for the retention of an adhesive material like composite resin. An obstacle that might be encountered are the presence of an aprismatic layer on the surface of primary teeth up to 25 μ thickness [8]. The prismless layer was eliminated by brushing the enamel surface with diamond bur before etching. So strip crowns were employed to restore the
upper incisors [8]. Strip crowns exhibit excellent aesthetics and patient satisfaction but the difficulty in moisture control, less surface area, and technique sensitivity often compromise the retention and the longevity of the restoration [8]. Resin restorations often exhibit polymerization contraction which can cause an inter-phase at the adhesive union, post-operative pain and marginal discoloration.

The third case was rehabilitated with a fixed functional space maintainer to replace the upper incisors. The remaining root and tooth structure of these incisors was very much less to provide a restoration with predictable retention, even with a post and core restoration. By retaining the root stumps after pulpectomy, the alveolar bone can be retained, as such, without resorption. The advantages of a fixed functional space maintainer are, it prevents the development of deleterious oral habits such as tongue thrusting, gives predictable aesthetics, improves self-esteem, ease of rehabilitation and less chair side time required when compared to post and core restorations. It improves phonetics and patient cooperation is not necessary unlike removal functional space maintainers [9], however, removable space maintainers are easier to clean and allow better maintenance of oral hygiene. But the disadvantage is that it can be removed and worn at the whim of the patient, and may be broken or lost easily [10].

4. Conclusion

The ultimate aim of anterior aesthetic rehabilitation of primary teeth is to enable the child to perform normal masticatory function, and maintain good esthetics by avoiding extraction of the teeth as much as possible to enable proper eruption of the succedaneous teeth. It is up to the clinician’s discretion which method is to be adopted for treatment, which in turn is dependent mainly on the extend of decay or the defect. Simple, economical and easy to execute method and also the long term predictability of the life of the permanent restoration are the other factors determining the restoration of these all important primary maxillary anterior teeth in children.

References


