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Esthetic and functional oral makeover of a 3 year old cleft palate patient suffering from early childhood caries using unconventional techniques

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Abstract

Cleft lip and palate (CL/P) are the most common congenital craniofacial anomalies. It has been observed that these children have a higher caries experience compared their non cleft counterparts. Early childhood caries results in early pulp involvement and gross destruction of the anterior and posterior teeth. This leads to decreased masticatory efficiency, difficulty in speech, compromised esthetics, development of abnormal tongue habits and subsequent malocclusion and psychological problems. The restoration of severely decayed deciduous teeth especially anteriors presents a special challenge to dentists, particularly in uncooperative children. The following case report documents the restoration of severely mutilated deciduous teeth in an emotionally immature cleft palate patient resulting in an improvement in not only oral and general health but also helping the patient gain more self confidence.

Key words: *Early Childhood Caries; Cleft Palate; Oral Rehabilitation; Esthetic Rehabilitation.*

Introduction

Neural tube defects and orofacial fissures are among the most common congenital alterations. Non-syndromic cleft lip and palate (CLP) are the most common anomalies in the skull-facial area. In many regions of the world, CLP is more common than the Down syndrome. Every two minutes, a child with CLP is born in the world, 660 children daily and 235 thousand new cases of fissures are seen annually. With the growth of the world population, we expect 3,200 new cases per year of CLP (1). Literature reveals that these children are more susceptible to dental caries (2). Early Childhood Caries (ECC) as defined by the American Academy of Pediatric Dentistry (2003) is the presence of 1 or more decayed (noncavitated or cavitated lesions), missing (due to caries), or filled tooth surfaces in any primary tooth in a child 71 months of age or younger (3). The prevalence is 1-12% in developed countries and 70% in developing countries, and changes in different cultures, communities, socioeconomic status, etc. In general, the prevalence of caries in preschool children is declining or has reached a plateau in most of the developed countries, but the same may be increasing in some developed and several developing countries. In Asia, in the Far East region, the prevalence in three-year-olds ranges from 36 to 85% (4), while in India a prevalence of 44% has been reported for caries in 8- to 48-month-olds(5).

The etiology of the disease is multifactorial like in any dental caries. In developed countries the primary risk factor is considered to be the use of a nap time bottle that contains a fermentable carbohydrate food such as milk with sugar, sweetened milk formula, fruit juice, sugar solution or other sweetened solutions, whereas in developing countries other factors such as linear enamel hypoplasia of primary teeth associated with malnutrition may contribute to the prevalence of this condition. Complex interactions between the use of sweetened pacifiers, nursing on demand, neglected oral hygiene, *Streptococcus mutans*, maternal education and dental knowledge, family structure and social status make its etiology complex (6).

The disease implications are high risk of new caries defects in both permanent and deciduous dentitions, insufficient physical development, hospitalization and emergency room visits, loss of school days and increased days with restricted activity, increased treatment costs and time, diminished ability to learn, and diminished oral health-related quality of life. Due to the aggressive pattern of the disease, treatment should be specific for each individual patient, and should be given by a specialist who can manage the young child and the process of the disease. Treatment options are: 1. Conservative approach which includes recalls and topical fluoride 2. Aggressive restorative approach. In both one should first stop the carious process and encourage prevention. To

choose the type of treatment, one should consider the severity of the lesions, child's age, caries risk, child's behavior, and parents' cooperation and socioeconomic status (7).

Full mouth rehabilitation including the esthetic restoration of severely mutilated primary anterior teeth has always been a challenge for the dentist, not only because of the limitations of the available materials and techniques but also because the children who require such restorations are usually among the youngest and least manageable group of patients. Most clinicians prefer to treat the emotionally immature children under general anesthesia. Treatment under general anesthesia has its own risks and limitations. The treatment is expensive and out of reach for most of the middle and low socioeconomic status children. It is also associated with a huge range of risks and difficulties (8). It is unpleasant for the child as well as for the parents.

The following case report describes the challenging task of treating a 3 year-old cleft palate patient suffering from early childhood caries presenting with multiple mutilated teeth. The child had a Frankel behavior rating of - - i.e. Definitely negative. The child refused treatment, cried forcefully and displayed an extremely negative behavior because of fear. The patient was managed using only voice control and other non pharmacological behavior management techniques. The child was dealt with an extra ordinary amount of patience and hence required multiple sittings. At the end of oral rehabilitation treatment the patient walked out of the operatory not only with the oral problems solved but also as a stronger and more confident individual with a positive attitude towards dental treatment developed for life.

Case Report

A 3-year-old male patient reported to the Department of Pediatric Dentistry, complaining of pain in severely decayed teeth. The highly uncooperative child had a subnormal IQ of 60 and was underweight because of long term inability to eat as most of the teeth were grossly destructed and painful. History revealed that the patient was on blood transfusions for treatment of severe anemia.

Intraoral examination revealed a cleft palate and multiple carious lesions, with pulpal involvement in 54, 53, 52, 51, 61, 62, 63,64, 74, 84. Crowns of the carious maxillary teeth were grossly destructed (Fig. 1). It was decided to do pulpectomy in 54, 53, 52, 51, 61, 62, 63, 64, 74, 84 followed by post and core and strip crown in 53, 52, 51, 61, 62 and 63. 64,74 and 84 were planned to be restored with stainless steel crowns. 54 could not be crowned as the crown structure was insufficient. It was decided to retain the obturated root stumps of 54 to serve as a passive space maintainer. The other carious teeth with no pulpal involvement were planned to be restored



Fig. 1. (A) Preoperative maxillary and (B) mandibular arch, (C) omega wire posts (D) postoperative maxillary arch.

with resin reinforced glass ionomer cement. Pulpectomy followed by composite restoration (strip crown) using custom-made posts, were performed in the maxillary anteriors along with the other required treatments. For building core in the deciduous anterior teeth, about 4 mm of cement was removed from the coronal end of the root canal, and 1 mm of glass ionomer cement was placed. A 0.7-mm stainless steel orthodontic wire was bent using no. 130 orthodontic pliers into an omega loop so as to allow the ends to be engaged at the entrance of the root canal. The incisal end of the loop of the wire projected 2-3 mm above the remaining structure. The loop was inserted into the canal with composite. The composite was light cured for 40 seconds. Strip crowns were used to reconstruct the coronal structure (Fig. 1).



Fig. 2. Intraoral and radiographic view of the oral rehabilitation

The occlusion was checked, and after the removal of interferences, final finishing and polishing of the restoration was performed using Soflex tips®. After completion of the procedure, post operative photographs and orthopantomogram were taken (Fig. 2). Home care instructions and diet counseling, were given to the parents. Recall checkups were performed every 6 months.

On follow-up visits it was observed that apart from the dental benefits the child also became more confident socially. As no general anesthesia was used the child got over his dental fear and learnt to accept dental treatment. The general health of the child improved as indicated by an improvement in the hemoglobin level and a gain in body weight.

Discussion

Dental treatment of immature uncooperative children has always been a challenge. General anesthesia is used for such children, but is an expensive alternative. It is also associated with adverse events and unpleasant side effects. An important consideration for children who are unable to cooperate due to fear, anxiety or young age is their subsequent acceptance of care using other methods with low risk and low impact as general anesthesia does not shape the behavior of a child (9). Therefore in the presented case an effort was made by the authors to manage the children without anesthesia or sedation.

In the presented case, custom-made posts were used in anterior teeth; other available options such as nickel-chromium cast posts, preformed and cast metal posts were not considered they are expensive and require additional lab work. The use of metal posts needs the use of an opaque resin to mask the unaesthetic post and also poses additional problems during the course of natural exfoliation (10).

An esthetic option for such cases is a biologic post. The disadvantage of this technique is acceptance and stringent infection control policies.

Available literature shows that intra-canal retention in primary teeth can be obtained by directly building resin composite posts or preparing an “inverted mushroom-shaped” undercut in the root canal prior to the buildup of the resin (11). However, resin composite posts have low strength of loading. Previous studies concluded that fiber reinforced composite resin posts show higher strength, retention and marginal adaptation (12). However the high cost of glass fiber reinforced composite resin post limits its use. Considering the socioeconomic status of the patient a custom-made post using an orthodontic wire followed by strip crowns was used. Literature reveals that this achieves satisfactory results in a child patient (13). However, it is technique sensitive and requires parent’s cooperation. Also there is a chance of loss of restoration due to trauma or biting on hard food, so the parents were instructed to teach the child to avoid

hard food.

The child was very happy and satisfied with the functional and esthetic results, viz., mastication, speech, cosmetic function, etc. Restorations were found to be serving well at the 1 year recall appointment.

In this study, authors take the view that full-mouth rehabilitation without GA can enable children to cope with future dental care and leave them in a position where they may be more amenable to dental care. A child benefits from oral rehabilitation in more than one way. Apart from the dental benefits, oral rehabilitation also contributes towards improvement of general and psychological well being.

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