



Esthetic management of Early Childhood Caries: An Interplay of Demineralization v/s Remineralization – A Case Series

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Abstract

Dental caries is an irreversible microbial disease resulting due to demineralization of enamel leading to cavitation. Early Childhood Caries (ECC) is defined by the American Academy of Pediatric Dentistry as “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”. Despite great emphasis on prevention, ECC sadly remains prevalent. Poor oral hygiene, sugar consumption frequency and improper oral hygiene maintenance all contribute to the problem. ECC affects the child’s quality of life leading to poor nutrition and delays in growth and development. It may also lead to poor self-esteem because of the esthetic impairment caused by ECC. This paper reports on 2 cases of ECC and their management emphasizing for restoration of smiles not only for functional but psychological reasons as well.

Keywords: Case report, Children, Early Childhood Caries, Esthetic, Pediatric Dentistry

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1. Introduction

Dental caries is an irreversible microbial disease resulting due to demineralization of enamel resulting into cavitation appearing clinically as decay. According to Millers Chemo parasitic theory, cavitation (tooth decay) occurs with acidic dissolution of enamel mineral, which is produced from oral bacteria. American Academy of Pediatric dentistry defines Early Childhood Caries (ECC) as “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” When a child shows any sign of smooth-surface caries in a child younger than 3 years of age, it is classified as Severe ECC (S-ECC) [1]. Although a great deal of emphasis is placed currently on oral hygiene and plaque control, ECC sadly remains prevalent. Poor oral hygiene, frequency of sugar consumption, bacterial plaque, improper oral hygiene maintenance all contribute to the problem and maybe listed as risk factors for ECC. ECC influences the child’s life quality, leading to avoidance of certain food groups, poor nutrition and delays in growth and development [2]. It may also lead to poor self-esteem as a result of the esthetic impairment caused by ECC. This paper reports on 2 cases of ECC and their management emphasizing for restoration of smiles not only for functional as well as psychological reasons.

2. Case reports

2.1. Case 1

A girl patient, age five, came to the clinic complaining of several carious teeth in her upper front region. The girl had a non-contributory medical history and was physically fit for her age. The parents also disclosed the child was withdrawn and avoided smiling and socializing after the front teeth were discolored. On intra oral examination, the child had a deep caries affecting the pulp in relation to 51, 52, 61, 62 with loss of substantial amount of tooth structure. The tooth number 64 was also pulpally involved. (Figure 1). The detailed treatment plan was discussed and approved by the parents. All treatments were performed under local anesthesia to avoid any pain/discomfort for the child. Pulpectomy procedures were completed on the maxillary incisors and tooth number 64. The incisors were then restored by composites (Universal adhesive system (3M ESPE®, Brazil) and composite resin Z350 (3M ESPE®, Brazil) using strip crowns. A Stainless Steel Crown was indicated for tooth 64 but could not be performed due to inadequate vertical height of remaining natural tooth. Hence composite restoration was done for tooth 64. (Figure 2) Both the parents and child was happy with the treatment and it was heartening to note during recall appointments, the child was smiling and playful again.



Figure 1. Pre-operative photographs case 1



Figure 2. Post-operative photographs case 1



Figure 3. Pre-operative photographs case 2



Figure 4. Post-operative photographs case 2

This confirmed the treatment was successful not only in restoring the physical defects of the teeth but also alleviating the associated mental stigma for the child.

2.2. Case 2

A male patient aged 5 years 6 months reported to the clinic with a main complaint of decay in the upper front teeth and bad breath. The child was medically fit and well-built for his age. On examination, child had dental caries with varying degree of loss of tooth structure in the maxillary incisors. There were also carries in relation to tooth # 74, 75, 84,85 and 65. Tooth #54 was grossly decayed with the crown being non-restorable (Figure 3). The treatment performed included Pulp therapy in relation to 51, 61. The carious teeth were restored using universal adhesive system (3M ESPE®, Brazil) and composite resin Z350 (3M ESPE®, Brazil). Tooth 54 was extracted, a fixed nonfunctional space maintainer namely band, and loop was constructed for space management to allow for the eruption of the permanent tooth and avoid any space loss and associated problems in eruption (Figure 4). Oral health education was given to both the children and their parents and instructions on flossing, brushing, and fluoridation. Diet control was employed to reduce frequency of snacking and the consumption of fermentable carbohydrates. During the follow-up visits, oral hygiene instructions, proper brushing techniques were re-emphasized to reinforce the message. Topical fluoride application was done and recall visits were established every 6 months.

3. Discussion

An imbalance between the numerous risk and protective variables that cause dental caries leads to the establishment of ECC, which can cause discomfort, early tooth loss, malnourishment, growth retardation, masticatory issues and speech difficulties. ECC also has an impact on the child's self-esteem, particularly if the oral deformities are apparent when the youngster grins, speaks, or eats. [3,4,5] Both bacterial plaque and inadequate dental hygiene are linked to an increased risk of ECC. These serve as a sort of window into both the child's oral hygiene habits and the mother's understanding of maintaining good oral hygiene [6]. ECC in the anterior primary teeth may result in parafunctional behaviors (such as speech and tongue interposition problems), or even malocclusion and space loss that impact the child's conduct and personality [7, 8]. The choice of restorations and space maintainers in the cases we treated were well thought out. The success rates of Strip crowns being superior to multi surface composite restorations has been established by multiple studies and a systematic review [9,10,11]. Pre veneered zirconia crowns however provide the most satisfactory replacement when retention, esthetics, fracture resistance, parental satisfaction, and gingival health are considered. [12]. When we consider space maintainers, the removable space maintainer is most frequently engaged. However its use requires patient's compliance to wear the appliance. Moreover, accidental ingestion or aspiration, breakage and loss are other concerns [8]. A fixed space maintainer such as the band and loop space maintainer used in our study eliminates this dependency on the patient to provide effective and efficient space maintenance. ECC is an infectious and contagious

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disease. Consequently, one of the main objectives of public health should be to avoid caries in young children. Educating people about good eating habits can help lower the incidence of dental caries in children. Furthermore, it is imperative to construct oral health awareness programs that encompass all relevant stakeholders, including mothers, caregivers, community health workers, preschool instructors, and children [2]. The mother can be a source for *Streptococcus mutans*. Therefore, lowering the mother's levels of *Streptococcus mutans* may lower the child's chance of getting caries [13]. The current caries management paradigm is conservative and emphasizes prevention. The demineralization process involves loss of minerals at the advancing front of the lesion. The remineralization process is a natural repair mechanism to restore the minerals again in ionic forms, to the hydroxyapatite (HAP) crystal lattice. The chemical basis of the demineralization–remineralization process is similar for enamel, dentin, and root cementum. Newer concept of incipient caries management has been tried with various remineralising agents such as Casein Phospho Peptides–Amorphous Calcium Phosphates (CPP-ACP), Bioactive glass, Nano Hydroxyapatite particles, and Self-Assembling Peptides [14]. Monitoring the disease status is made possible by early detection of non-cavitated lesions, Individual risk assessment of caries progression, comprehension of the disease process, active pursuit of preventative measures, and supervision is required. Control of disease development was prioritized in the treatment plan and simultaneously with the patient's oral health education, child's oral hygiene was improved. As a novel strategy, motivational interviewing might also aid in fostering constructive behavioral changes [15].

4. Conclusions

Prevention of ECC is of paramount importance. Oral health awareness should be offered to mothers with involvement of community health workers, caregivers, preschool teachers and children to achieve this goal. Dentists should be capable of early diagnosis and be well versed in the conservative management of ECC. Dental treatment should not only restore the decayed tooth but also reclaim the lost smiles of these little souls by reestablishing their quality of life. Constant guidance and patient awareness and focus on personal responsibility for their oral health is essential for the long-term oral health of children.

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