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Comprehensive Rehabilitation of Multiple Missing Teeth in Severe Early Childhood Caries: A Case Report

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Authors' contributions

This work was carried out in collaboration among all authors. All authors read and approved the final manuscript.

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Case Report

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ABSTRACT

This case report highlights the necessity, advantages, clinical results, and significance of removable complete dentures as a comprehensive rehabilitation option for children with severe early childhood caries. Early childhood caries requires multidisciplinary approach that includes diagnosis, treatment planning, and oral function maintenance in order to restore aesthetics, mastication, phonation and oral health in children. The chief complaint of a 5-year-old girl who was referred to the Department of Pediatric and Preventive Dentistry was the early loss and total destruction of her milk teeth, combined with eating difficulties and repeated hospital visits due to dental infections. Prosthetic rehabilitation with removable dentures has the benefit of optimum comfort and allowing for simple adjustments while the jaws are growing and developing.

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1. INTRODUCTION

Early childhood caries (ECC), which affects almost half of preschool-aged children globally and has a pooled prevalence of around 48%, remains a major global health concern despite continuous emphasis on caries preventing strategies in primary teeth. In India, ECC affects one out of every two children, which is alarming [1]. Functional, physical, and aesthetic impairment are among the effects of ECC, which frequently have an early impact on children's overall health [2]. Children with ECC are more likely to develop new carious lesions, be admitted to the hospital, have higher treatment expenses, be at risk for delayed physical growth and development, miss more school days and have more days with limited activities, have a decreased learning capacity, and have poorer quality of life related to oral health. In order to optimise comfort, aesthetics, and general health, oral rehabilitation for children with ECC is a multidisciplinary approach that includes diagnosis, treatment planning, and oral function maintenance. Additionally, the primary focus should be on prevention and educating parents about oral health ailments. A wide range of prosthetic options are available, including implants, over-dentures, fixed denture prosthesis, and removable full or partial dentures [3,4]. However, a child's age appropriate growth of jawbones and permanent teeth must not be impeded in any way. Considering they are simple to modify as the child develops, removable partial and complete dentures with acrylic denture bases are the most widely accepted option for restoring the oral function in children.[3] Therefore this case report presents the necessity, advantages, clinical results, and significance of removable partial dentures as a prosthetic rehabilitation for children with severe early childhood caries

2. CASE REPORT

The chief complaint of a 5-year-old girl who was referred to the Department of Pediatric and Preventive Dentistry was the early loss and total destruction of her milk teeth, in addition to eating difficulties and repeated hospitalizations due to dental infections. Over the past year, the mother reported intermittent fever episodes and frequent facial swelling that subsided with prescription. Up to the age of three, the child was breastfed every day. Mother stated the child has been using bottles with sweetened liquids often since the age of six months, has an unrestricted access to cariogenic food, and was breastfed/bottle fed when demanded. There was no history of oral habits or local trauma.

The maxillary anterior teeth's crown destruction was noticed during the intraoral examination. Extensive carious lesions were found in the mandibular and maxillary molars with respect to 55, 65, 36, and 46. All those teeth with coronary damage (Fig 1a and b) show the root stumps at 54, 53, 52, 64, 75, and 85.There were no other abnormalities found on an orthopantomogram. (Fig 2) Lidocaine (2% with epinephrine 1:100,000) was administered for local anaesthesia during the scheduled extractions. (Fig 3) The suggested course of action was to deliver a removable complete denture. The patient's behaviour improved over the course of the treatment, which took place over several sessions, but always with the mother present.

Fig. 1a. Preoperative Extraoral Photograph

Fig. 1b. Preoperative Intraoral Photograph

Fig. 2. OPG Reveals Presence of All Permanent Tooth Bud

Fig. 3 a. Extraction of Root Stumps

Fig 3. b. Post Extraction Intra Oral Photograph

Fig. 3 c. Stainless Steel Crowns on 55 and 65

3. PROSTHETIC REHABILITATION

Multiple extractions resulted in a loss of vertical dimension, impaired facial aesthetics, and difficulties in speaking and chewing. Use of complete denture prosthesis requires child's cooperation and parental motivation. However child was cognitively developed to understand and follow instructions of denture wear. Addition silicone was used for the impression (Express XT Denso, 3M). Dental stone (Goldstone) was used into the working cast, and modelling wax was used to build the base plate and occlusal rim. The maxillomandibular relationships were recorded during the next appointment. Acrylic teeth were used for the teeth arrangement, try in of the prosthesis was then done and adjusted, phonetics and aesthetics were assessed (Fig 4a-d). The prosthesis was acrylized using heat-cured acrylic resin (DPI heat-cure) once retention was confirmed. For better adaptation to the thin and resilient alveolar ridges, a resilient tissue reconditioning material (Coe-Soft; GC América, USA) was applied and internal relief was achieved. (Fig. 4e) Occlusion and retention were modified on the day of denture delivery to ensure appropriate joint function, balance, and trauma-free occlusion. The dentures required a total of six sessions to fabricate and deliver.

Fig. 4a. Fabrication of Occlusion Rim

Fig. 4b. Jaw Relation and Teeth Arrangement

Fig. 4c. Try In and Fit In

Fig. 4 d. Acrylised Removable Denture in Relation to Upper and Lower Arch

Fig. 4 e. Delivery of the Removable Prosthesis

4. FOLLOW UP AND MAINTENANCE

Both parents received instructions on the importance of periodic dental check up, as well as usage and hygiene of the dentures (daily brushing).

The wearing instructions called for the denture to be worn continuously throughout the day and tak en off at night to sleep. The child and the family were encouraged to adopt healthy eating and oral hygiene practices and prevent the recurrence of dental caries. The patient was recalled to assess oral health and adaptability, o ne week after the denture was inserted.Every 15 days, the child was checked on.A vent would the n be created to aid in the eruption of the sucedan eous tooth after the eruption status of the perma nent tooth has been assessed. In addition to social behaviour, nutrition, phonation, and self-esteem, the patient and family expressed great satisfaction with the treatment. (Fig. 5.)

5. DISCUSSION

Children who lost their teeth prematurely benefit greatly from prosthetic treatment in terms of maintaining their psychological and functional integrity. One of the most frequent causes of child's need for prosthetic rehabilitation is early loss of teeth due to trauma or dental caries. According to studies by Reddy et al. and Ahamed et al., India has high prevalence rates of 13.5 and 16.5% for early loss of primary teeth respectively. Worldwide, severe early childhood caries (S-ECC) is very common and can have a major negative impact on a child's quality of life. Multiple episodes of dental pain and infections, poor mastication, delayed physical growth and development, hypoplasia of developing permanent teeth, missed school days, learning difficulties, and low self-esteem are all negative outcomes of untreated S-ECC [5, 6]. Children who lost their teeth early benefit greatly from prosthetic treatment in terms of maintaining their psychological and functional integrity. Additionally, early primary tooth extractions cause psychological trauma, disrupt occlusal development, and impair oral and overall health. Prosthodontic rehabilitation can help improve dental health and, consequently, overall health-related quality of life, including growth and development, self-esteem, pain episodes, sleep quality, and oral function [5,7]. Restoring chewing function, enhancing phonetics, halting the emergence of detrimental oral habits, and reducing adverse psychological effects are all made possible through prosthetic rehabilitation in cases of multiple loss of teeth.

Fig. 5. Immediate and One-Month Post-Operative Extraoral Photograph

Although it is advised that prosthetic rehabilitation has to begin at age five, cooperative children may begin as early as age three or four. Additionally, the age range of three to five is a time when the bone is stable in both the transverse and sagittal planes [8]. In order to provide the child a normal appearance and time to get used to the prosthesis, Till and Marques suggested that the first prosthesis to be delivered before the child starts school. By compensating for the loss of vertical dimension, preventing angular cheilitis, and delaying alveolar bone resorption associated with tooth loss, prosthodontic treatment improves the tonicity of the masticatory muscles [6, 9]. The number of teeth present, inter-arch spacing, alveolar bone height and width, mucosal attachment, patient age, facial and lip support, mucosal thickness, and treatment, cost-effectiveness are some of the factors that influence treatment planning based on individual needs [7,10].

Child's prosthetic rehabilitation with removable dentures has the added advantage of allowing for simple modifications while the jawbones are growing and developing.9. Given that the patient's growth is constant, using a removable partial denture enables future relining and rebasing. Additionally, relining the current removable partial denture lowers the cost and frequency of prosthesis replacement in children.

Regardless the fabrication of complete dentures is similar to that done for adults, dentists agree that children adapt incredibly well. It is important to determine the desired level of cooperation. Until the child's permanent teeth erupt, adjustments must be made to accommodate their growth and development, and routine check-up sessions should be scheduled every three to six months.

6. CONCLUSION

Early prosthetic intervention for children with severe ECC is an essential component of comprehensive pediatric dental care, facilitating optimal oral health and supporting the child's physical and emotional development. However, long-term success depends on caregivers and dental professionals collaborating to prioritize frequent follow-up, dietary practices, and preventive treatment.

7. LIMITATIONS

While complete dentures may be considered for children with severe early childhood caries, the approach presents several limitations and challenges. The primary concerns revolve around emotional adjustments, along with the need for ongoing maintenance and replacement of the prosthesis as the child grows. Preventive measures and restorative care should always be prioritized where possible to avoid the need for dentures at such a young age.

DISCLAIMER (ARTIFICIAL INTELLIGENCE)

Author(s) hereby declare that NO generative AI technologies such as Large Language Models (ChatGPT, COPILOT, etc) and text-to-image generators have been used during writing or editing of this manuscript.

CONSENT

As per international standards, parental written consent has been collected and preserved by the author(s).

ETHICAL APPROVAL

As per international standards or university standards written ethical approval has been collected and preserved by the author(s).

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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