

Enhancing smile and Altering Thrust using Modified Groper's Appliance: A Case-Report

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Abstract:- Early childhood caries, has a major influence on child's lifestyle, resulting in child experiencing severe pain, premature loss of teeth, poor nutrition, difficulty chewing, speech, compromised esthetics, development of abnormal oral habits and delay in achieving normal growth and development of child. This paper presents a case report of a Four-year-old child diagnosed with Severe Early Childhood Caries. It explains treatment plan for rehabilitating child's mouth, including caries prevention and restorative procedures using appliances and making special adjustments to a child's feeding habits, combined with maintaining good oral hygiene practices. Early childhood caries is an important oral condition that requires prompt treatment and early intervention. Early diagnosis and awareness of ECC are essential for helping the child maintain a good quality of life.

Keywords:- Early Childhood Caries (ECC), Groper's Appliance, Esthetic Rehabilitation, Primary Teeth.

I. INTRODUCTION

Early childhood caries (ECC) is a biofilm-mediated, multifactorial disease induced by imbalance between demineralization and remineralization of dental hard tissues. ^[1] ECC majorly affects a child's quality of life, potentially leading to severe pain, early tooth loss, poor nutrition, compromised aesthetics, speech difficulties and development of abnormal oral habits. ^[2] Esthetic rehabilitation and space management are important elements of dental care following early loss of primary teeth. ^[3] This paper presents a case report of a Four-year-old child, diagnosed with Severe- Early childhood caries and describes fabrication and modification of Groper's appliance.

II. CASE REPORT

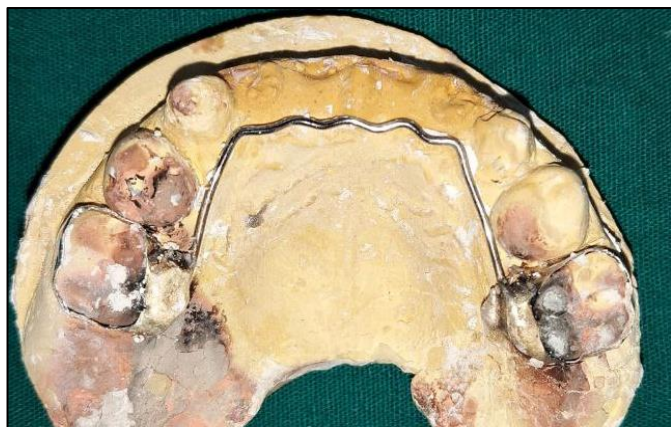
A Four-year-old girl reported to Department of Pediatric and Preventive Dentistry with complaint of decayed upper front teeth. The child was hesitant to communicate during first dental visit. After being familiarized with dental environment, child displayed a positive Frankl behaviour rating. Her general health was good, with no history of systemic, allergic, or immuno-compromising illnesses. However, there was a notable history of tongue-thrusting habit due to severely decayed anterior teeth.

Intra-oral examination revealed carious 51,52,61,62,54,64,65,74,75,84,85. Maxillary anterior teeth were grossly decayed with periapical abscess and mobility. Radiographic examination revealed pulpal involvement of 51,52,61,62,54,64,65,74,75,84,85. Following this treatment plan was formulated. Written consent was obtained from parents which explained treatment plan and expected cost. Initial treatment involved extraction wrt 51,52,61,62. Pulpectomy was performed wrt 54,64,65,74,75,84,85 followed by stainless steel crown. Banding was done wrt 55,65. Impression was made followed by fabrication and insertion of Groper's appliance.

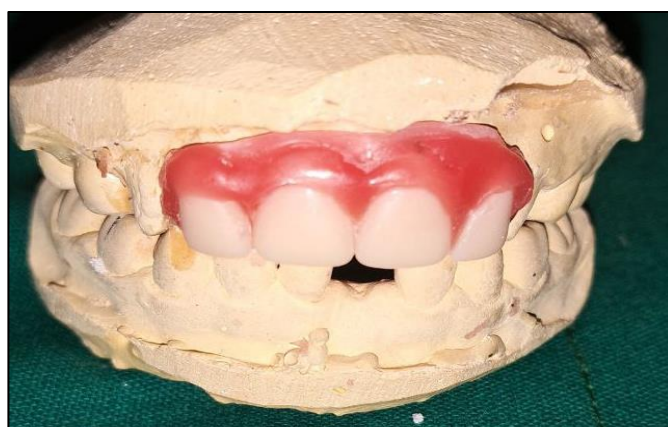
III. FABRICATION OF GROPER'S APPLIANCE

Multiple U bend was made using stainless steel wire of 0.9mm diameter. Design extended from palatal surface of stainless-steel band placed on second primary molar to palatal surface of opposing second primary molar. After stabilizing the wire component, the wire was soldered to the band (Fig. 1a). A self-cure acrylic base plate was prepared on wire component, acrylic teeth arrangement was done, followed by a try-in (Fig. 1b). Appliance was then fabricated using heat-cure acrylic resin, trimmed and polished with pumice (Fig. 1c, d).

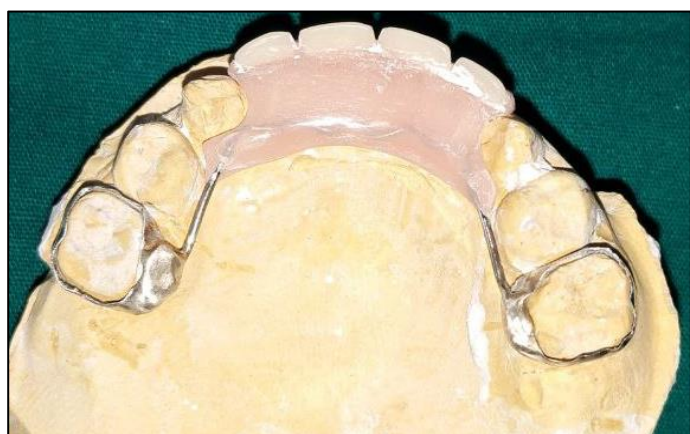
➤ *Fabrication of Groper's Appliance:*



1(a).



1(b)



1(c)



1(d)

Fig 1: Fabrication of Groper's appliance – (a)Soldered Wire onto Band (b)Try in (c)Trimmed Appliance (d) Polished Appliance

Appliance was inserted and cemented using Luting Type I GIC (GC FUJI I) after checking for occlusal disturbances (Fig. 2). Patient and parent were given post-insertion instructions regarding appliance, oral hygiene

methods and eating patterns. Patient was scheduled for regular follow-ups, and new appliances will be provided as child grows.



2(a)



2(b)



2(c)



2(d)

Fig 2: Insertion of Appliance (a)before Rehabilitation (b)after Rehabilitation (c, d) Intra-Oral Photograph of Maxillary and Mandibular Arch After Full Mouth Rehabilitation

➤ *Modification of Groper's Appliance:*

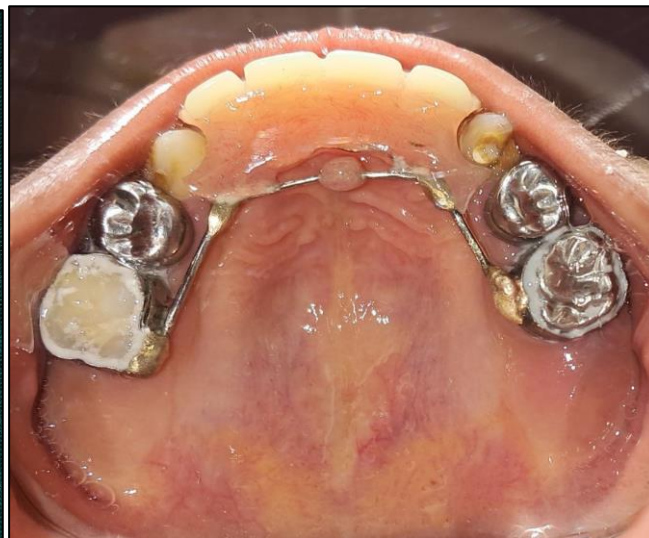
After two months, patient returned with a distorted appliance. Upon examination, it was noted that tongue-thrusting habit persisted. To address this, a self-cure acrylic

bead was incorporated into palatal region, stabilized with stainless steel wire, and soldered to the newly fabricated appliance. The appliance was then trimmed, polished and cemented after checking for occlusal disturbances (Fig 3).

➤ *Modification of Groper's Appliance:*



3(a)



3(b)

Fig 3: (a) Modified Groper's Appliance with Incorporated Acrylic Bead (b) Post Insertion

IV. DISCUSSION

Early childhood caries (ECC) is defined as presence of one or more decayed (non-cavitated or cavitated lesions), missing or filled (due to caries) surfaces, in any primary tooth of a child under six years of age. [1] ECC is avoidable, but currently affects more than 600 million children worldwide, and remains largely untreated. This disease significantly affects quality of life for children and their families and imposes an unnecessary burden on society. Primary teeth preserve space for permanent teeth and are crucial to a child's well-being, thus dental caries may lead to chronic pain, infections, and other health issues. [2]

Premature loss or decay of primary teeth, especially primary anterior teeth will lead to development of destructive habits such as tongue thrusting accompanied with subsidiary problems in speech and esthetic concerns leading to developing malocclusions and space loss which can hamper the normal growth and development of the child along with reduced self-esteem and other related psychological concerns. [3] In addition to functional rehabilitation, esthetic rehabilitation in young children is important for both appearance and pronunciation. The oral rehabilitation in this case was guided by patient's age, cooperation during procedures, and clinical findings, all of which contributed to treatment plan.

Historical evidence indicates that space maintainers are not necessary for loss of upper anterior teeth once the canine has erupted. However, Kapur et al., stated esthetic rehabilitation of primary teeth positively affected child's mental well-being.^[4] Fixed functional space maintainer helps prevent harmful oral habits like tongue thrusting, provides consistent aesthetics, improves self-esteem and requires less chairside time compared to post and core restorations.

V. CONCLUSION

Early childhood caries is a significant oral condition that necessitates prompt treatment and early intervention. Early detection and knowledge of ECC is important to help child lead a quality life. Primary objective of anterior aesthetic rehabilitation is to restore normal mastication and maintain good aesthetics. Described treatment is simple, effective and offers a better alternative for rehabilitating severely decayed or fractured primary teeth.

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