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Reviving Innocence: Smile Reconstruction in Toddlers Using GROPER'S Appliance – A Case Report

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Abstract

Premature loss of anterior teeth is frequently seen in the pediatric dental clinic which results in a possible disturbances in the occlusion development and presents a number of physiological and psychological problems. The purpose of this study was to report a case of rehabilitation of anterior primary teeth, with the aid of fixed functional space maintainer – Groper's appliance.

Keywords: Early childhood caries, Groper's Appliance, Anterior Primary Teeth, Functional Appliance, Esthetic

Introduction

Primary teeth are wrongly denoted as "temporary teeth" despite being very important for a child's overall health, mastication, aesthetics, pronunciation, personality, emotional well-being etc. Primary teeth have a major impact on one's quality of life. Early loss of primary anterior teeth impacts a child's growing dentition and presents a number of physiological and psychological problems.[1]

The greater the number of lost teeth at an early age, the greater the crowding observed in permanent dentition,

and the early the loss, the more severe resulting of malocclusion will be.[2-3] So, the space should be maintained functionally as well as aesthetically by a suitable space maintainer depending on the dental age of the patient. The space maintainer may be of removable, fixed or semi-fixed, functional or non-functional type.[4]

The present article is aimed at discussing a case of aesthetic-functional rehabilitation due to early loss of anterior primary teeth by early childhood caries with Groper's Appliance. The groper's appliance was first documented by Jasmin and Groper in 1984. The main objective of Groper's appliance as to help in space maintainence, esthetics appearance and speech. [5]

Case report

Parents of 3-year-old female patient reported to the department of pedodontics and preventive dentistry, Himachal Dental College, Sundernagar, with the chief complaint of decayed teeth with the abcess formation in the upper front region of the mouth. No histories of trauma, systemic diseases, or any infections were reported. No abnormality was detected in extraoral features such as general appearance, height, weight, and built. The patient's facial profile was bilaterally symmetrical. Intraoral examination revealed severly affected maxillary anterior teeth with only root stumps visible in relation to 52, 51, 61 and 62 [figure 1]. Radiographic presentation showed pathologic root resorption in relation to teeth 52, 52, 61 and 62. A diagnosis of early childhood caries in teeth 52, 51, 61 and 62 on the basis of clinical and radiographic presentation was made. The parents of the child were very concerned about the esthetics and wanted to restore the anterior teeth.

Treatment planned

All the grossly decayed teeth were planned for extraction and it was carried out under local anesthesia. Groper's appliance was used for the replacement of primary anterior in the maxillary arch. The esthetic appliance was designed in such a way that a functional space maintainer was incorporated in the wire framework of Groper's appliance. This appliance was chosen because of its advantages such as preserving an open space and restoration of esthetics and function.

In first appointment

Bands were fabricated on 55 and 65 and impression was made.

Figure 1(a): Pre-operative intraoral frontal view.

Figure 1(b): After placement of appliance frontal view.

Figure1(c): After placement of appliance occlusal view.

Figure 1(d): Post operative frontal facial profile after placement of Groper's appliance

Lab procedure

Groper's appliance fabrication

Cast was poured with Type III gypsum product-Dental stone. Extending from one band to other band, a

stainless steel wire (1.00 mm) framework was made and wire ends were then soldered to the corresponding molar bands of the maxillary teeth. After applying separating media, the cold cure acrylic material being flowed from the palatal area to the labial vestibule and extended to the posterior 64 region over the arch wire. Then, the acrylic teeth were trimmed according to the maxillary primary incisor and teeth were placed over the alveolar crest with the acrylic material. After fabrication of the appliance, it was removed from the cast and ready for an intraoral try-in [Figure 1].

In second appointment

All the grossly carious root stumps of primary maxillary central incisors were extracted under local anesthesia. Required adjustment, trimming and polishing was done, and finally, appliance was cemented with luting GIC through the molar band on 55 and 65 [Figure 1(b-c)]. The patient was instructed to maintain proper oral hygiene especially cleaning of acrylic area after every meal. The patient was also instructed to visit after 1 month for follow-up and in case of any breakage of appliance, report immediately. The patient was then followed every month for three successive months and problem of accumulation of food debris and plaque was observed.

Discussion

ECCs is one of the major oral health problems which affects infants and preschool children in both developed and developing countries.[5] The prevalence of ECC depends on several factors such as socioeconomic status, lifestyle, dietary pattern, and oral hygiene. A review of the literature reports that in most developed countries the prevalence rate of ECC is between 1 and 12%.[5] The national surveys from some countries, such as Greece (36%), Brazil (45.8%), India (51.9%), and Israel (64.7%), showed inconsistent prevalence of ECC. It initiates with white-spot lesion in the upper primary incisor and continues to progressive caries development leading to multiple tooth destruction.[7]

Losing deciduous anterior teeth before the age of three might cause speech difficulties. Missing primary anterior teeth should be replaced for several reasons; one of the most important reason is that it helps children's psychological development by restoring their appearance.[8]

Parental desire is one of the main decisive factors for treating these types of clinical situations.[9] Different types of appliance have been developed to manage the space including-

1. a provisional removable partial denture replacing the missing tooth (teeth);
2. a provisional fixed acrylic bridge utilizing the adjacent teeth as full crown abutments; or
3. a bonded bridge using either a denture tooth, or a chair side fabricated composite resin tooth as the tooth replacement.[10]

Fixed acid-etch bridging may offer several advantages over removable appliances including enhanced esthetics, ease of use and avoidance of becoming accustomed to a removable prosthesis.[9]

The Groper appliance was developed in 1984 to minimize the aesthetic and functional consequences of early anterior tooth loss. The appliance is similar to a Nance holding arch, but instead of a palatal acrylic button in the rugae region, it uses acrylic plastic teeth coupled to a wire. A legitimate purpose to replace lost incisors is to restore a natural and pleasant look and so allow for appropriate psychological development. The primary drawback is that food debris accumulates. So, patients and their parents must be thoroughly educated on the value of dental hygiene.[11]

In this case report parent's main concern was patient's esthetics and the patient not only achieved pleasant appearance with the help of Groper's appliance but many benefits in terms of improved mastication, speech efficiency and protection against the formation of undesirable oral habits.[1] The demerit of this appliance is the accumulation of food debris and plaque. To overcome this, parents should be given oral hygiene guidelines to practice at home.

Conclusion

Replacement of the missing incisors with the GROPER'S appliance not only enhance aesthetics and but also act as functional space maintainer. It is an easy, simple and comfortable appliance for the young patients than a removable appliance. This appliance enhanced the child's self-esteem by restoring her anterior aesthetics and develops proper speech during their growing period of life.

References

1. Kirtaniya BC, Kaur J, Lyall BS, Pathania V. Modified Nance Palatal Arch: An Aesthetic Approach to Missing Anterior Teeth- A case report. Indian Journal of Dental Sciences. 2015 Jun 1;7(2)
2. Riekman GA, Badrawy HE. Effect of. Premature loss of. Primary maxillary incisor son speech. Pediatr Dent 1985;7:11922.
3. Waggoner WF, Kupietzky A. Anterior esthetic fixed appliances for the preschooler: Consideration sand a technique for placement. Acad Pediatr Dent 2001;23:2.
4. Khare V, Nayak PA, Khandelwal V, et al. BMJ Case Rep Published online: [please include Day Month Year] doi:10.1136/bcr-2013- 009585
5. Jasmin JR, Groper JN. Fabrication of a more durable fixed anterior esthetic appliance. J Dent Child 1984;51:124-7.
6. Livny A, Assali R, Sgan-Cohen HD. Early childhood caries24 among a Bedouin community residing in the eastern outskirts of Jerusalem. BMC Public Health 2007;7:167
7. Anil S, Anand PS. Early childhood caries: Prevalence, risk factors, and prevention. Front Pediatr 2017; 5:157.
8. Anand S, Singh A, Jyoti D, Sulekha, Seal B. An esthetic approach for premature missing maxillary primary anterior teeth: A series of two case reports. Indian J Dent Sci 2021; 13:205-8.
9. Kumar S, Kalra N, Tyagi R, Khatri A, Dhamija M, Singh HV. Esthetic rehabilitation of anterior missing teeth due to early childhood caries. Int J Pedod Rehabil 2020; 5:32-4.
10. Strassler HE. Aesthetic management of traumatized anterior teeth. Dent Clin North Am 1995;39:181-202
11. Arikan V, Ocal D, Akcay M, Altug AT, Ozer L, Cesur E. Growth-enabling modified Groper appliance for the replacement of permanent maxillary incisors: Report of two cases. Australasian Orthodontic Journal. 2020 May; 36(1):108-13.