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Case Report

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Contemporary approach for space maintainers: A case report

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Abstract

Mini implants have seen an evolutionary change in the phase of implant placement. The most common use for mini implant is the stabilization of over denture and orthodontic treatments, now they are used in pediatric dentistry for congenitally missing teeth and tooth loss due to trauma. Mini implants as a prosthetic replacement gives a psychological advantage to the child as it provides a feeling of his own teeth. A thirteen year old boy came to the department of pedodontics, KVG dental college, Sullia, with a chief complaint of spacing in the lower front tooth region since 4 years. On radiographic examination absence of 41, 31 were found. On model analysis, space deficiency was found in relation to the lower anterior and he was diagnosed with angle's class I malocclusion with proclined maxxilary anterior teeth and congenitally missing lower central incisors. The patient's main concern was on esthetics. Hence the patient was planned for a fixed provisional functional space maintainer using mini implant followed by crown prosthesis. The approach comes up with positive aesthetic and functional results that may reflect on self-esteem and social well-being of children and adolescents.

Keywords: Mini implants, Space maintainer, Missing teeth, Functional, Acrylic crown.

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INTRODUCTION

An edentate smile might look attractive in an infant but its persistence is a serious cause of apprehension for the parents and the child. Missing of teeth may be either due to congenitally missing or trauma [1]. Congenital missing of teeth are one of the most common scenario in dentistry and which is termed as dental agenesis. Prevalence of hypodontia in India is 1-10% [2]. Maxillary lateral incisors followed by maxillary second premolars and mandibular central incisors are the most common congenitally missed teeth. Agenesis of bilateral mandibular central incisors is very rare. Newman (1998) have given four main theories for the cause of agenesis of lower incisors [3]. Heredity or familial distribution, anomalies in the development of the mandibular symphysis, an expression of the evolutionary trend, localized inflammation or infections in the jaw and disturbance of the endocrine system [3], Mutation in the gene like MSX1, TGFA and PAX9 [4].

Dental agenesis will adversely affect the child's ability to chew, and may affect his or her self esteem. Replacing a missing teeth in children is always been a challenge for pediatric dentist. There are numerous treatment options in pediatric dentistry. Recently mini implants are used in pediatric dentistry for replacing congenitally missing teeth and tooth loss due to trauma.

CASE REPORT

A 13 year old male patient came to the department of pedodontics, KVG dental college with a chief complaint of spacing in the lower front teeth since 4 year. Parent gave a history of loss of lower front milk teeth 4 years back and failure of emergence of new teeth. Patient main concern was on esthetics. No other associated signs and symptoms with the disease. On general physical examination patient's height, weight, built and nourishment corresponds with the chronological age. He had a gross symmetric face. The intraoral examination revealed missing of permanent mandibular central incisors and thin and narrow alveolar ridge in the edentulous area (Fig 1). Orthopantomography shows missing of mandibular central incisors (Fig 2). On model analysis the difference between the tooth material and the arch length was 5mm, which was sufficient for only one teeth. Based on the positive clinical findings and investigation, we came to the

diagnosis of angle's class 1 malocclusion with maxillary anterior proclination and congenital missing of 31, 41. In this patient we decided to go for mini implants for a fixed provisional functional space maintainer using mini implant followed by crown prosthesis. After thorough oral prophylaxis a crestal incision was made and full thickness flap was reflected and the bone was exposed. As it was a knife edge ridge, the ridge was flattened using platform switching bur. Self drilled implant was placed (1.2mm diameter, 8mm length – genesis) using a dynamometric torque wrench. Flap was sutured back (Fig 3). The putty impression was taken. Patient was recalled after 1 week for checking the stability and followed by the placement of the acrylic crown. Followed by active labial bow for correction of proclination. Patient was instructed to maintain oral hygiene around the implant-retained prosthesis using an interdental brush and mouthwash. The patient were satisfied with the treatment and he a good adaptation of the dental prosthesis. The increased self-esteem boost the socialization skills of the patient

Figure 1: Thin and narrow alveolar ridge in the edentulous area

Figue 2: Orthopantomography

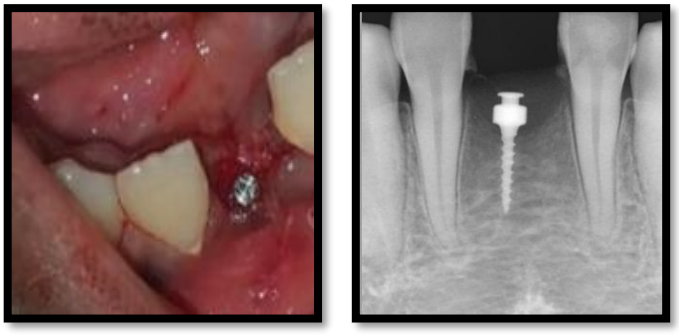

Figure 3: Placement of mini implants intraoral and radiographs

Figure 4: Acrylic crown is placed

DISCUSSION

Loss of teeth will affect the self-esteem, communication behavior and quality of life [Stanford, 2007; Bateman *et al*., 2010; Levin *et al*., 2006; Giannetti *et al*., 2010]. Besides an unappealing appearance, it may also cause malocclusion, periodontal defects, inproper alveolar bone growth, decreased chewing ability, inarticulate pronunciation [5]. Patients with agenesis of mandibular central incisors exhibit significantly smaller mandibular symphysis area and greater retroclination of the mandibular alveolar bone, altered muscular forces due to imbalance between tongue and lip pressure that further deteriorates occlusal discrepancies like class II div I, anterior deep bite and reduced lower facial height. Insignificant volume of alveolar bone and smaller symphyseal region have influence on placement of future endosseous implant [6]. Buschang *et al*. [7], found that, vertical and horizontal growth changes during childhood and puberty, were most pronounced in the upper half of the mandibular symphysis and tooth eruption plays a critical role in continuous growth of the mandibular symphysis, resulting in an increase in the height of the mandibular body. Bu *et al*. [8] reported that agenesis of tooth significantly decrease the intercanine and intermolar widths of the arch. Age of the patient, number and condition of retained teeth, number of missing teeth, condition of supporting tissues, the occlusion, the interocclusal space are the Factors to be taken into consideration before the treatment planning [9].

Mini implants as a prosthetic replacement gives a psychological advantage to the child as it provides a feeling of his own teeth they have a relatively small diameter (<3 mm), which allows the fixture to be placed even in the presence of transverse bone loss. The mini-implants have minimal osseointegration and, consequently, allow the volumes of soft and bone tissues to be maintained until growth is complete. Finally, their removal is non traumatic and not associated with any further deficit [10]. Sousa de Oliveira *et al.* [11] found that artificial tooth-supporting orthodontic implants can be successfully used to replace missing permanent teeth in children. Melsen B *et al*. [12] found that the miniscrew stimulates the alveolar ridge and thus helps prevent ridge atrophy, and it prevents the adjacent roots from drifting into the edentulous space. The simple technique of insertion, the absence of a recovery period and inexpensive make mini-implants an extremely suitable temporary prosthetic treatment in children during the period of jaw bone growth compared with conventional implants [13]. Giannetti *et al*. [10] showed a successful implant prosthetic rehabilitation in a growing patient using mini implants in his two-year case report. This approach is intended to convince the esthetic needs of the patient temporarily and can be used as a space maintainer until the growth of the patient is completed and the patient is economically ready to undergo further restorative treatment [14]. The limitation of the case is normal esthetic couldn't be attained as there is a midline shift

CONCLUSION

Mini-implant is becoming promising alternative to crown anchorage in the anterior region, mainly in oral rehabilitation of patients under development due to its simple technique, versatility and better biocompatibility. It improves the patient's quality of life, social integration and increases the self-esteem.as it provides good aesthetic and functional results.

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