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Placement of Implants in Palatum of a Teenager without Maxillary Incisor Teeth

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***Abstract*—**The process of skeletal growth in an adolescent significantly affects the displacement of implants placed in the palatine suture. The problems caused by this process have an impact on the dental function and aesthetics of the affected data. If fixed prostheses are placed based on implants, the whole structure would impede maxillary growth. This is the significant difference between the maxilla and the mandible, as the lower jaw has no growth process that affects the movement of the implants or the latter to inhibit the growth of the jaw. In a teenager patient an accident occurred accompanied by loss of maxillary central incisors. The main complaint of patients is aesthetics and phonetics. Dental history of patients refers to the presence of a Maryland bridge that was accompanied by dissatisfaction on the part of the patient. Implant placement is not indicated as jaw augmentation may lead to displacement of the implant. The treatment plan includes the placement of implants in the palatum where this bone thickness allows as a procedure.in this article only the first stage of treatment is presented. Implant treatment is ongoing, will be followed by the second phase of treatment when the patient has reached the age of 18 years.

***Keywords*—**Implants, palatum, adolescent, primary incisor teeth.

I. Introduction

IMPLANTS have gained a high popularity in replacing missing teeth in adults. Placement of implants in adults is a common procedure, but in adolescents there is a lack of data on these cases. The treatment and placement of implants in teens is still in its infancy.

Implants are placed in the bone not fully developed during adolescence, that is the big problem that dentists must deal with at this age of the patient.

Implants could protect the residual bone, increase retention, enhance the stability, beauty, and chewing power and improve the life quality in general. The clinical significance is in connection with bone integration and undesirable effects on maxillary and mandibular skeletal growth and subsequent tooth eruption, use of implant in growing patients arouses some concerns [1]

There have always been contradictions regarding the placement of implants in children and adolescents. One of the pioneering studies from Bjork as stated in [2] evaluates the way the dental arch bones develop and the implant placement in adult children. Oesterl also Brahim, as stated in [2]-[4], compared dental implants with ankilosed teeth. An osteointegrated implant acts like an ankylosing tooth, at the same level of bone development and tooth eruptions. These authors suggest that implants placed in the posterior maxillary in the baby may be exposed after the anthralose and nasal floor remodeling occurs. The authors recommend that implants should not be posteriorly placed behind the canyons during active growth.

Implants localized in the mid palatinal suture in a child before puberty can be shifted at a considerable distance from transverse growth and this can create aesthetic and functional problems. Implants associated with fixed prostheses inhibit maxillary transverse growth. Otherwise, it occurs in the lower jaw that does not have growth sutures and implants located in the median line have a better prognosis in new patients than those placed in other mandibular and maxillary regions.

Indications for implant placement in adolescent:

- Pediatric patients with ectodermal dysplasia.
- Implants combined with bone grafts in patients with alveolar and palatal cramps.
- Anodonty children, adolescent, partial anodonty, genetic disabilities, and traumatic tooth loss.
- Children with difficulty in using mobile dental prostheses [2]-[6]

Ectodermal dysplasia is a rare congenital disease that affects several structures of ectodermal origin. The most related oral characteristics are hypodontia, malformed teeth and underdeveloped alveolar ridges. Clinical studies with long-term follow-up are needed to test the mini implants as an alternative for oral rehabilitation of children with ectodermal dysplasia [7]. Contraindications:

- Age before puberty.
- Patients with the peak of puberty growth.
- Insufficient middle-class space.

Chronological age is not enough to evaluate bone development. The bone growth status can be determined by the handbrake graph, namely the formation of the middle finger skeleton (MP3cap) indicates that the puberty peak has passed, and we may think about implant placement.

If implants are placed over the bone growth peak, they may be misdiagnosed by active growth and may require their removal and re-implantation. Implants placed after age 15 for girls and 18 for boys have good diagnosis. Implants placed before these ages need re-implantation.

For frontal maxilla and implants, it is important to look at the patient's age in order to obtain information about the level of skeletal growth and how the lack of teeth in the anterior area can or has affected the psychological development of the child, the teenager. This has to be considered, in addition to the status of existing dentition and dental compliance of a pediatric patient [4].

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The clinical success of implant placement in patients of pediatric age or adulthood lies in the continuous control with cephalometric radiographic examination of bone growth. Definitive placement of definitive implants is performed only when the growth process is complete [5].

It is the most difficult area for implant placement due to unpredictable growth in this area, especially in the presence of natural teeth. Premature placement of the implants may require repeated prolongation of the transgingival and transmucosal part of the implant. Alternative approaches for replacing missing upper incisor in growing individuals should be considered, which include autotransplantation [7], resin-bonded bridges and closing the space with an orthodontic appliance [8].

II. Case Presentation

The 14-year-old patient appears at the clinic on September 5, 2016, with no headaches. Loss of power plants has come because of an accident. He refers to concerns during mastics and a major reason is aesthetics. Initial dental history included a Maryland bridge but was uncomfortable for the patient seeking solutions to the case. This is a complicated case for the fact that the patient is 14 years old and has not yet completed the development of the jaw and cannot apply implant placement to adults (Fig. 1).

Fig. 1 The 14 years old patient that has not yet completed the development of the jaw and cannot apply implant placement

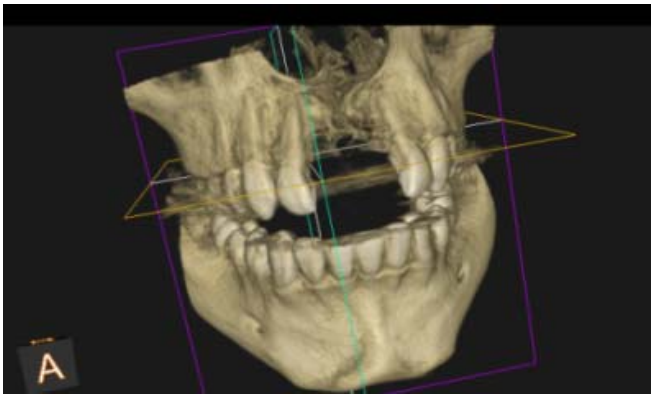

Fig. 2 The radiological examination used to see the bone condition at the front of the jaw

III. Methods

The first step taken for the patient is the radiological examination to see the bone condition at the front of the jaw. This was done to see if, besides the loss of power plants, the accident caused damage and support bone. It also analyzed the condition of the neighboring teeth if they showed mobility if they migrated during this time (Fig. 2).

The beginning of the treatment of the patient is shown at Fig. 3. This is the preparation of the first implant placement.

Fig. 3 The first step of treatment of the patient, preparation for the placement of the first implant in the fourth palatine plaque

Implants are placed in the fourth palatine plaque as the bone thickness is greater. This is shown at Fig. 4.

Fig. 4 The placement of implants in the fourth palatine plaque, at correct position, at the right direction: The first implant is going to be the right direction for the placement of the second implant

Fig. 5 The placement of the second implant in the fourth palatine plaque as the bone thickness is greater the symmetrical position of implants is clear

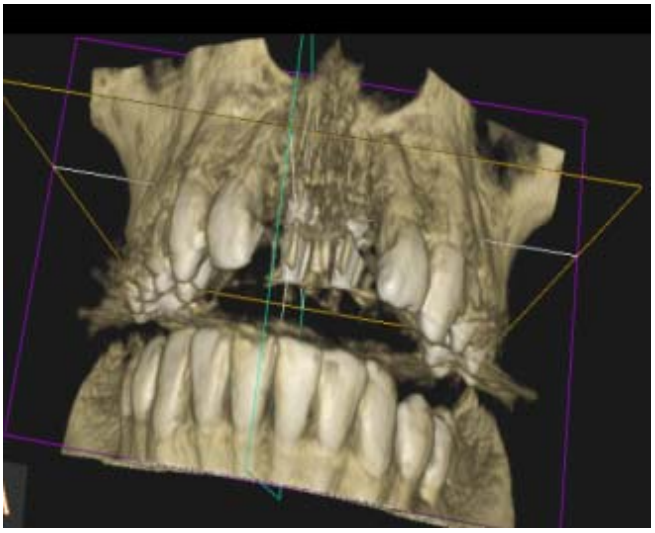

Fig. 6 Patient's 3D graph after implant placement on the palate: the symmetrical position of implants is also clear at the 3D graph

Fig. 7 Panoramex of the patient after implant placement: the position of the two-implant placed at the front maxilla is clear; the age of the patient is also clear at the panoramex

Fig. 8 Placement of the provisional bridge in the adolescent patient of the clinical case

IV. Discussions

15 years of age for girls and 18 years of age for boys are the age limits when the placement of definitive implants can be indicated. Otherwise, the placement of implants in patients younger age, should be followed with the predetermined individual bone growth control protocol of the patient in question [3]. Placing implants in the treatment plan should also include subsequent supportive therapy, as the patient should be well instructed on how to take care of oral hygiene after the implants and the structures on the implants are functional in the oral cavity [2], [9]-[12].

Fig. 9 Evidence of the metal skeleton of the bridge placed in the oral cavity of the patient

Fig. 10 The result at the end of treatment

The placement of implants in pediatric age is not a routine procedure as special protocols must be established that include the indications for placement but also the indications for selecting the most suitable type of implants [6], [9].

In dental practice, the denture treatment plan always includes the option of implant placement. They promote a better lifestyle and rehabilitate the patient for a normal mastication. However, teenagers are used in less frequent cases due to the development of the jawbone development. If the surgeon feels the contraction and timing of implant placement correctly, success is guaranteed.

Treatment in this patient is not over yet. This type of technique used will be followed by a second phase of treatment at the age of 18 after the patient has passed the bone growth stage [10]-[12]. This stage involves implant placement in the incisal space and procedures followed in adults.

V. Conclusions

In dental practice, the denture treatment plan always includes the option of implant placement. They promote a better lifestyle and rehabilitate the patient for a normal mastication. However, teenagers are used in less frequent cases due to the development of the jawbone development. If

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REFERENCES

[1] Sharma AB, Vargervik K. "Using implants for the growing child"; J Calif Dent Assoc 2006;34:719-24.
[2] Marzieh Mohamadi Moghadam; Review Article "Implant applications for children"; International Journal of Contemporary Dental and Medical Reviews (2017), Article ID 060117, 7 Pages. Department of Periodontics, Faculty of Dentistry, Mashhad University of Medical Sciences, Mashhad, Iran
[3] Brahim JS. "Dental implants in children"; Journal of Indian Society of Pedodontics and preventive Dentistry; Oral Maxillofac Surg Clin North Am 2005;17:375-81.Year: 2013; Volume:31; Issue:1; Page: 3-9.
[4] SK Mishra, N Chowdhary, R Chowdhary: "Dental implants in growing children"; Maxillofacial Prosthodontics and Implantology, Dental College, Azamgarh, Uttar Pradesh India; Year 2013.
[5] Navdha Chaudhary, Babita Ahlawat, Ashok Kumar, Vijaylaxmy and Pawan Goel; Review Article; Indian J.Sci.Res. 6(2): 193-197, 2015; ISSN: 0976-2876 (Print); ISSN: 2250-0138 (Online).
[6] Nidhi Agarwal, Dipanshu Kumar, Ashish Anand, and Surendrakumar Kaluram Bahetwar; "Dental implants in children: A multidisciplinary perspective for long-term success"; Natl J Maxillofac Surg. 2016 Jul-Dec; 7(2): 122–126.
[7] Bianca Zeponi Fernandes Mello, Thiago Cruvinel Silva, Daniela Rios, Maria Aparecida Andrade Moreira Machado, Fabrício Pinelli Valarelli; "Original Articles Mini-implants: Alternative for Oral Rehabilitation of a Child with Ectodermal Dysplasia"; Brazilian Dental Journal; Print version ISSN 0103-6440On-line version ISSN 1806-4760; Braz. Dent. J. vol.26 no.1Ribeirão Preto Jan./Feb. 2015.
[8] J. Jofré, A. Werner; "Use of mini-implants to replace a missing tooth in a growing patient: a six-year follow up case report"; European Journal of Paediatric Dentistryvol. 16/4-2015284
[9] Percinoto C, Vieira AE, Barbieri CM, Melhado FL, Moreira KS. Use of dental implants in children: A literature review. Quintessence Int 2001;32:381-3.
[10] Robo, I., Heta, S., Papakozma, D. et al. Modification of implant surfaces to stimulate mesenchymal cell activation. Bull Natl Res Cent 46, 52 (2022).
[11] Robo, I., Heta, S., Papakozma, D., & Ostreni, V. (2021). Qelizat burimore mezenkimale, reagimi ndaj sipërfaqeve implantare drejt osteointegrimit. Optime, *12*(1-2), 33–47.
[12] Ilma Robo, Saimir Heta, Dhimitri Papakozma, Vera Ostreni; "Biological activity of mesenchymal stem cells in the surface of implants"; International Journal of Dental Sciences; E-ISSN: 2663-4708, P-ISSN: 2663-4694Volume 1; Issue 1; 2019; Page No. 43-50.