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Research Article

REFORMING DENTOFACIAL ESTHETICS WITH IMPLANTS IN ECTODERMAL DYSPLASIA PATIENT- A CASE REPORT WITH ONE YEAR FOLLOW UP

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ABSTRACT

Ectodermal dysplasia is a disorder of a group of syndromes derived from abnormalities of the ectodermal structures. Patients usually present with two or more ectodermal structures such as the hair, teeth, nails, sweat glands, salivary glands, cranial-facial structure, digits and other parts of the body. Advances such as implant supported fixed prosthesis has shown a promising future to these patients. The aim of the present study is to present a report on a boy with hypodontia caused by hypohydrotic ED who received dental implants at the age of 20 years and provided implant supported fixed dental prosthesis. Four implants were placed avoiding the mental foramen. Post operative OPG after 6 months revealed sustained level of bone around implants. A one year post operative follow up showed improved chewing efficiency, esthetics and had a better standard of living. Post operative OPG after 1 year of implant placement showed consistent level of bone around implants.

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INTRODUCTION

Ectodermal dysplasia is a disorder of a group of syndromes derived from abnormalities of the ectodermal structures. Although 170 clinically distinct hereditary syndromes are recorded in medical history the symptoms are similar. (kere et al,1996) Patients usually present with abnormalities of two or more ectodermal structures such as the hair, teeth, nails, sweat glands, salivary glands, cranial-facial structure, digits and other parts of the body. These can be identified by clinical observation and case histories revealing familial tendencies. World wide around 7,000 people have been diagnosed with an ectodermal dysplasia condition. Hypohydrotic ectodermal dysplasia also known as "Anhydrotic ectodermal dysplasia," one of the 170 syndromes wherein the patient presents with hyperthermia due to reduced sweat glands, hypotrichosis and hypodontia. (Ezzine et al, 2009) The quality of life of the patient is hampered from a very young age due to unacceptable esthetics and abnormal function of orofacial structure. Lack of teeth leads to poor nutrition thereby compromising health. It also leads to poor esthetic appearance that discourages the patients to interact and be confident in the society.

Fixed or removable dental prosthesis thus can be provided to promote rehabilitation of the partially dentate ridges thereby aiding the physiological as well as psychological status of the

patient. Various studies have reported rehabilitation of the ridges using removable partial dentures from a very young age. Removable options such as maxillary hollowed dentures opposing mandibular dentures have shown success over the years (Bonilla et al,1997) Although the treatment is easy and cost effective the prosthesis bears the burden of poor retention, high maintenance and patient usually finds the treatments repetitive and tedious.

Advances such as implant supported fixed prosthesis has shown a promising future to these patients. Implants inserted into pediatric patients do not follow the regular growth process of the craniofacial skeleton and are known to behave similar to ankylosed teeth, resulting in both functional and esthetic disadvantages (Op Heji et al, 2003). Additionally, they can interfere with the position and the eruption of adjacent tooth germs, thus resulting in potential severe trauma of the patient (Rossi et al,2003). The use of endosseous implants in the prosthetic rehabilitation of patients with HED may provide considerable improvement in comparison with traditional prosthetic methods. (Kearns et al,1999)

The aim of the present study is to present a report on a boy with hypodontia caused by hypohydrotic ED who received dental implants at the age of 20 years with completed cranio-facial growth and provided implant supported fixed dental prosthesis. Four implants (Ankylos A9.5,A11,A11,A9.5

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wrt34,33,43,44) were placed avoiding the mental foramen. Broadricks Occlusal Plane Analysis was done and the ceramic build up was done accordingly. The distal most molars were also prepared and PFM crowns were cemented to provide an ideal occlusal plane. After the mandibular rehabilitation, maxillary teeth were prepared and impressions were made to fabricate PFM dental prosthesis

Case History

Detailed Case Report: A male patient aged 20 years came to the outpatient department of prosthodontics with a chief complaint of missing teeth since birth in the upper and lower jaws.



Figure 1 Facial Aspect -Frontal View

On clinical examination and the medical history it was concluded that patient suffered from Hypohidrotic Ectodermal Dysplasia. Intra oral examination presented with peg shaped teeth in the maxillary arch and mulberry shaped molars in the mandibular arch.(Figure 2)



Figure 2 Intra Oral View -Pre Operative

Panoromic Radiographs and Cone beam CT were taken to analyse the bone height, bone width and bone density (Figure 3a-c)

Blood picture showed normal values for the surgery. Implant selection was then done accordingly.

Informed consent of the patient was then taken after explanation of the entire procedure. Pre surgical antibiotic prophylaxis was commenced one day before surgery, and 1 hour before the surgery. (Amoxicillin 500Mg, Thrice daily)

The surgical phase

The patient was dressed and sterilized surgical instruments were arranged. Crestal incision was made with respect to mandibular ridge under local anaesthesia and a full thickness flap was reflected. (Figure 4)



Figure 4-full thickness flap reflected

Knife edge bone ridge was flattened to attain a wider platform for implant placement using a straight handpiece (20 000 rpm) with copious irrigation(Figure 5)

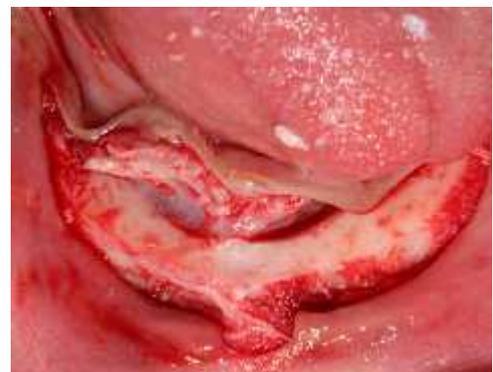


Figure 5 crestotomy using straight handpiece

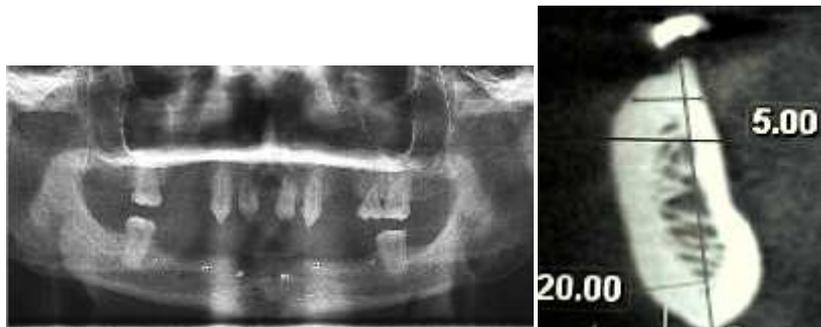


Figure 3a Pre Op OPG,3b- Cone beam CT showing maximum width -5mm and maximum height 20 mm.

Implant osteotomies were carried out with recommended sequence of drills. Ankylos Twist drill of 2mm diameter was used to prepare the initial osteotomy site(Figure 6)



Figure 6 initial osteotomy using twist drill.

Ankylos Trispade drill (A) of 2.9mm diameter was used to extend the osteotomy site. Paralleling pins were placed in each osteotomy indicating their parallelism.(Figure 7)



Figure 7-paralleling pins used to check parallelism

Conical reamer was used to widen the osteotomy to fit the conical core of the implants. Ankylos bone tap was used for the dense bone present in the mandibular region to prepare the implant thread. Four implants (Ankylos A9.5,A11,A11,A9.5 wrt34,32,42,44) were placed avoiding the mental foramen under 20 rpm speed. Primary stability of 50 Ncm was achieved. Cover screws were then placed in (Figure 8)



Figure 8 subcrestal placement of implants.

If immediate provisional restoration is considered, it is essential to have about 35 Ncm of insertion torque. If moderate primary stability of about 25 Ncm is achieved, then a

transmucosal healing screw can be placed to avoid second stage surgery.(Turner *et al*,2010) Vicryl 3.0 Sutures were then placed and primary closure was achieved. Post operative radiograph showed the subcrestal placement of implants. (Figure 10)

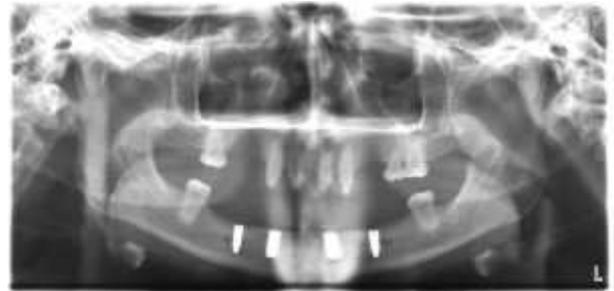


Figure10-immediate post operative OPG

Post operative antibiotics and analgesics were prescribed. (Amoxicillin & ibuprofen respectively) for 1 week. Antibacterial mouthwash (Chlorhexidine 2%) was advised to be gargled twice daily for 15 days. Patient was given instructions on maintenance of oral hygiene and was recalled after one week, one month and three months,6 months and 1 year for follow up.

The second stage surgery and the prosthetic phase

The cover screws were retrieved and sulcus formers were placed to contour the peri implant soft tissue and patient was recalled after 15 days .After ensuring ideal sulcus formation implant level impression(closed tray method) was made and casts were poured with the implant analogues.(Figure 11a &11b)



A



b

Figure 11a:Final master cast , b: transfer jig

An anterior re-orientation transfer jig was made using pattern resin on the selected abutments.(Figure 11 b-transfer jig)Ankylos Regular Abutments (1.5/15°,1.5/0°,3/0°,3/15° wrt 44,42,32,24)were then tried on the mouth with the help of the jig.(Figure 12)



Figure 12 trial of the abutments

Metal framework was then customized and metal trial was done in the patients mouth. An ideal vertical dimension was established and recorded in the patients mouth using Aluwax. This relation was then mounted into a Semi adjustable articulator.

Broadricks Occlusal Plane Analysis was done and the ceramic build up was done accordingly. The distal most molars were also prepared and PFM crowns were cemented to provide an ideal occlusal plane. After the mandibular rehabilitation, maxillary teeth were prepared and impressions were made to fabricate PFM dental prosthesis. Metal trial was done and the ceramic structure was constructed. Final cementation was done (Figure 13)



Figure 13 final cementation

Mutually protected occlusion was given in this patient. Patient was adviced to maintain oral hygiene using water pik. Mouth wash was prescribed and the patient was adviced to swish the mouth regularly to keep the mouth moist. Immediate post cementation OPG (3 months after implant placement) showed sustained levels of bone crest.(Figure 14)



Figure 14 OPG post cementation

DISCUSSION

Hypohydrotic Ectodermal Dysplasia is the most prevalent form of ED. Given the high complexity of developmental control during embryogenesis, it is expected that considerable genetic heterogeneity underlies HED. To date, molecular research has shown that 64 genes and 3 chromosomal regions are involved in EDs Mutations in the EDA, EDAR, or EDARADD gene prevent normal interactions between the ectoderm and the mesoderm and impair the normal development of hair, sweat glands, and teeth. The improper formation of these ectodermal structures leads to the characteristic features of hypohydrotic ectodermal dysplasia.(Visinoni et al, 2002).

Affected individuals tend to have sparse scalp and body hair (hypotrichosis) reduced sweating (hypohydrosis) and reduced number of teeth (hypodontia) or teeth that are malformed. The teeth that are present are frequently small and pointed.Because this syndrome is frequently accompanied by a congenital lack of teeth, narrow palate, and malocclusion, comprehensive orthodontic intervention is required. Most individuals have severe oligodontia with 9 to 18 missing teeth. The missing teeth are mainly maxillary and mandibular incisors and second bicuspid, arranged in a symmetrical manner.

Recent years have established that implants show great success in the oral rehabilitation of these patients. Depending on the remaining available alveolar bone and the pattern of missing teeth, the ideal treatment option for an adult ED patient often includes the use of implants. (Rashedi et al, 2003)

In this case report a 20 year old male patient arrived with a chief complaint of chewing difficulties and harsh looks. Patient conveyed his concerns, quote “not being able to eat his favourite food”. Implant supported fixed prosthesis in the mandibular region and tooth supported fixed dental prosthesis in the maxillary region was planned.

The platform switched designs of Ankylos implants have proven to meet the following criteria of clinical stability and function, reduced inflammation of the peri-implant hard and soft tissue, no progressive loss of the peri-implant bone and no progressive loss of the peri-implant mucosa(Nentwig et al, 2004). Thus four implants were planned. Mandibular occlusal plane analysis was done in the prosthetic phase and maxillary rehabilitation was carried out.

A One year post operative follow up showed improved chewing efficiency. (Figure 17a,17b,17c)



Figure 17a-smile -frontal view.



b



c

Figure 17b Labial aspect 17c- Mandibular arch- occlusal view

Post operative OPG after 13 months after implant placement showed consistent level of bone around implants.(Figure 18)



Figure 18 one year post operative OPG.

Thus oral rehabilitation of ectodermal dysplasia contracted patients with dental implants have proven effective and has become a promising long term and permanent treatment option. The fixed dental prosthesis improves chewing efficacy and provides high end esthetics. This promotes good nutrition as well as cosmetic appeal that improves the living standards of the patient.

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