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Rehabilitation of Congenitally Missing Anteriortooth with Bicortical Mini Implant-A Case Report

Dr Thara Maria joseph[1], Dr K Harshakumar [2], Dr R Ravichandran[3], Dr Prasanth[4], Dr Kavitha[5], Dr Kala[6]

[2,3,4,5,6]*Department of Prosthodontics, Government Dental College, Trivandrum, Medical College Campus*
Corresponding Author: Dr Thara Maria joseph,
[1]*PG Student, Department Of Prosthodontics, Government Dental College Trivandrum,*
Corresponding Author: Dr Thara Maria joseph

Abstract:*Bicortical implants are a breakthrough in the field of implantology. These were used conventionally in orthopedics and are beneficial in the field of implantology .Immediate prosthetic rehabilitationmeet the demands of patients as well as clinician. These are advantageous in cases were crestal bone loss has occurred.*

Key words: *Bicortical, crestal bone, osteoplasty, implant prosthesis, provisionalisation.*

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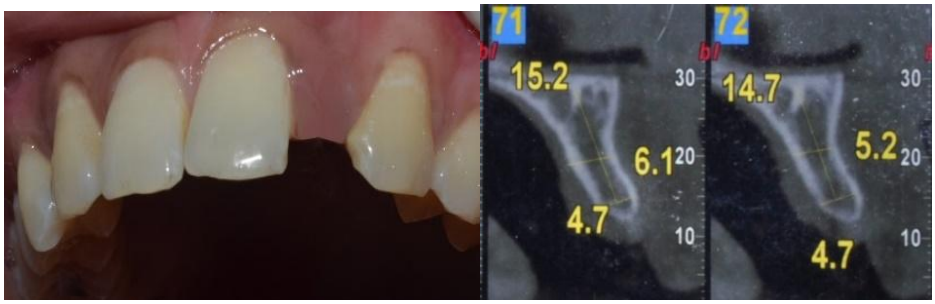
I. Introduction:

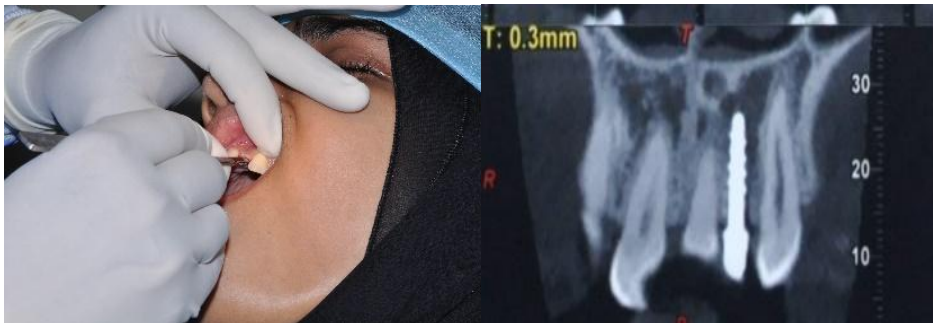
In our daily dental practice we are usually forced to face the routine demand of patients: They request to have the replacement of their missing teeth by fixed restoration in short term treatment protocols. The cost of treatment becomes usually the second obstacle that arises after treatment options are considered. Adhering to biomimetic principles, employing minimally invasive applications and other technologies are of paramount importance for successful restorations. The missing teeth can be replaced by removable or fixed prosthesis. Because of the known disadvantages of removable prosthesis patients will always opt for the fixed therapy. Fixed therapy may be fixed partial denture or implant prosthesis. The fixed partial denture needs support from the abutment teeth which has to be prepared to receive the crown. The introduction of implants eliminated the problem of abutment teeth to be prepared and gained more popularity. When considering the replacement of teeth in the anterior esthetic zone, immediateprovisionalisation of these implants are of great importance .This becomes even more difficult when the available bone volume is minimum. In most edentulous situations, the single piece screw type implants can be placed in a minimally invasive fashion, involving minimum osteotomy. Bicortical implants are a better option in this scenario and as they gain support from the cortical bone they can be immediately provisionalised.Replacing a lost tooth by using an implant has been reviewed and discussed over the past 40 years with the invention of many systems and the implementation of several protocols. Introduction of bicortical implants has been a breakthrough in the field of implantology. A paradigm shift towards the use of bicortical implants showed high successful rate. This is a case report which describes rehabilitation of congenitally missing tooth with bicortical mini implant with minimal intervention technology.

II. Case report:

A 20 year old patient reported to the Department of Prosthodontics, Government Dental College Trivandrum with missing lateral incisors and multiple minor spacing between maxillary anterior teeth region. .Radiologic investigation using orthopantomogram (OPG) revealed that her lateral incisors are congenitally missing.The treatment was planned by an interdisciplinary approach. The patient was referred to Department of Orthodontics for alignment and regaining of space between teeth.Afterorthodontic alignment, space was gained (fig.1) in maxillary left lateral incisor area and this space was maintained with retainer with incorporation of tooth. Implant surgery was then planned after proper investigation protocols and analyzing with implant simulation using CBCT (fig.2). A bicortical mini implant of 2.5*14 mm was planned and implant was placed (fig.3) withadequate primarystability.



1:Preoperative intraoral view2:Cone beam CT analysis



3:Implant surgery **4:cbct evaluation**

5: Initial prosthetic phase6:surgery for osteoplasty and gingivoplasty

7:gingivoplastydone 8: immediate provisionalisation

9:surgical site after six months 10:final ceramometal prosthesis with reestablished gingival zenith and esthetics

After three months review, the prosthetic phase was initiated and upon bisque trial it was realized that the gingival zeniths of the prosthesis is not esthetically pleasing (fig. 4). A mock osteoplasty was done on diagnostic cast and osteoplasty with gingival recontouring was planned by maintaining the biological zone and carried out (fig.6,7).Immediate provisionalisation was done (fig.8).After two months of follow up, it was found that proper gingival zenith was achievedin relation to adjacenttooth (fig, 9). Final prosthetic phase was then planned andceramometal full coverage prosthesis was delivered successfully (fig .10).

III. Discussion:

Single piece implants need less treatment duration, low demand of patient compliance and immediate loading can be done with simple surgical procedures**.** In our modern competitive society a pleasing appearance often means the difference between success and failure in our professional and personal lives. To attain this pleasing appearance, esthetics has become increasingly important in the practice of dentistry. Basal implantology also known as bicorticalimplantology or just cortical implantology is a modern implantology system which utilizes the basal cortical portion of the jaw bones for retention of the dental implants which are uniquely designed to be accommodated in the basal cortical bone areas. The basal bone provides excellent quality cortical bone for retention of these unique and highly advanced implants. Basal implantology includes the application of the rules of orthopedic surgery, thus basal implants are also called as 'orthopedic implants' to mark a clear distinction between them and the well-known term 'dental implants'. These implants when placed in this bone can also be loaded with teeth immediately. This science behind them has already been proved in orthopedics (Total hip/knee replacements)[4]. The advancement in material science and technology has developed in such a way that patients can attain this natural appearance in various ways. When we consider*"*Primumnihilnocere*"*, which means limiting the treatment, basal implants are the devices of first choice, whenever augmentations are part of an alternative treatment plan[3,4]. The technique of basal implantology solves all problems connected with conventional implantology. It is a patient oriented therapy, which meets the demands of the patients ideally.

The highest target in our profession is the fulfilment of patient's expectations within scientific limits. The patients anticipate painless esthetic replacement of their missing teeth or stabilisation of the prosthesis. Stableand esthetic reconstruction of the patient's dento-facial system is the main challenge of everydental specialist. There are certain situations where conventional implants are not feasible as the place available is limited. In such situation we go for mini implants. Usually, mini implants are 1.8mm to 3.3mm in diameter. These implant are also developed with a small ball on the top of it that could be incorporated as a snap for a denture, or to secure a temporary bridge. Most of the time, immediate loading is not an issue, but the osseointegration of an immediately loaded mini implants are of great concern. In order to enhance the rate of success, the implant design was improved in to follow the rules of osseointegration and the insertion protocol was changed to give the implants the primary stability necessary for immediate occlusal loading[5, 6].Bicortical screw implants provide an excellent option for restorations in esthetic (anterior) region especially in cases in which a single tooth replacement is indicated. They are self-tapping, pure titanium implants requiring the use of one-phase insertion technique and are available in a variety of shapes, sizes and lengths to suit various ridge forms including compromised ones. The additional stability provided by this screw allows for immediate loading at the time of implant placement. The advantages of using the MDI system in such cases are as follows[(7,8)]:Immediate loading, can be inserted in minimal tissues without relying on grafting techniques, minimally invasive procedure, one-stage denture stabilization, does not require osteotomy , can be placed in patients with ridge too narrow ridge for conventional implant. Moreover, they are cost-effective, thus enabling dentists to select the optimal implant for each individual indication. They are mainly designed for maxillary and mandibular anterior regions although there have been claims of their placement in the premolar region without complications. It is important to mention that in the present case, the esthetic outcome of the final restoration was outstanding .

IV. Conclusion:

Replacing a missing tooth in the anterior aesthetic zone with an immediate loaded implant is considered one of the most challenging procedures. Bicortical implants can be placed in compromised ridges and can be immediately loaded thus giving the dentist and the patient a viable option to look into successful implant therapy. Prosthetic rehabilitation with minimally invasive procedures are a better option for patients seeking esthetic corrections and who are not willing for extensive surgical procedures. Here the article describes a multidisciplinary approach with alignment and gaining space for a fixed prosthesis without much invasive fixed orthodontic or prosthodontic means. Esthetics was enhanced by reestablishing gingival zenith with which patient could avoid the social stigma of missing anterior tooth by the immediate implant placement.

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