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RESEARCH ARTICLE

IMPLANT PLACEMENT IN ANTERIOR AESTHETIC ZONE: A CLINICAL CASE PRESENTATION.

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ABSTRACT

Introduction: A Dental implant placement is a surgical procedure in which component of implant interfaces with the bone of the jaw or skull to support a dental prosthesis such as a crown, bridge, denture. A successful implant placement in aesthetic zone is depends on the health of the person receiving the treatment, drugs which affect the chances of osseointegration, density of bone and the health of the tissues in the mouth. Implant placement in the anterior maxilla remains a challenge to surgeons because of functional and aesthetic results. Dental implants may be used to replace single or multiple teeth, or provide abutments for complete dentures or partial dentures. This case report study is representative of such instance, when following the correct guidelines, a successful outcome is made possible when aesthetic result is prime concern. The aim of this article to present case report with replacement of missing anterior teeth in compromised site with Dental Implants and bone graft to obtain desirable result in aesthetic zone. **Case Report:** A 30 year male patient visited to the Department of Oral & Maxillofacial Surgery at, Nagpur with chief complaints of loss of upper front teeth due to trauma 2 year back. On detailed intra oral examination revealed that missing teeth on 11,21 & 22 regions. After proper treatment planning endo-osseous implant followed by Alloplast bone graft was placed and guided tissue regeneration membrane was placed on the labial bony surface in defect area. **Conclusion:** The case report includes the planning, execution and outcome stages of an Implant in the anterior maxilla. Implant therapy fulfil both functional and aesthetic concerns of the patient as it is considered a primary treatment modality. Before surgical placement of a Dental Implant, the adequate hard and soft tissue must be available. The clinician must consider the time needed for Implant Osseo integration (total integration of Implant within the Bone) and soft-tissue healing around the implant, creation of emergence profiles, occlusal loading forces in relationship to progressive masticatory forces on the final restoration.

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INTRODUCTION

Dental Implants placement in the aesthetic zone is considered to be the one of the most challenging procedure for many Oral & Maxillofacial Surgeon. Placement of implant in aesthetic area is challenging because of esthetic concern and unfavorable bone morphology.

The status of Hard tissue as well as soft tissue architecture is one of the most important factors for successful implant placement. Professionals aimed at creating an implant-supported restoration that replicated natural teeth (El Askary, 1999). That is why the, implant supported restoration in the anterior region remains a challenge (Spielman, 1996). Patient acceptance of Dental Implants in the aesthetic zone is increasing due to many factors, including the wonderful results shown in the media.

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In the previous time available bone density often restricted placement of implants into areas such as the anterior mandible. Today prosthetic requirements utter, to a great extent, the placement of Dental implants. Advancements in the field of Dental Implant therapy have lead to expected survival rates of Dental Implants (Bashutski, 2007). The current definition of success in addition to long-term predictability, function and integration of the implant focuses on aesthetic considerations (Simeone, 2007). In the anterior maxilla this is more critical due to the visibility of the region and if a high lip line is present, the smile line is more revealing thus increasing the need for an aesthetic result, with some authors ranking function and aesthetics in the anterior maxillary region to be of equal because of the following importance.

- Bone regenerative materials (Bone graft),
- Soft tissue augmentation techniques (Regenerative surgery),
- Wide temporary healing abutments (Custom Healing Components),
- Natural profile abutments (Healing cap/Gingival former), and
- Tooth colored abutments (Zirconia / Ceramic crown) main tools for creating optimal emergence profile of an implant placement in the aesthetic zone. Replacement of missing teeth for better function and aesthetics of the patient, this case report presents the replacement of a missing anterior teeth in compromised site with Dental Implants and bone graft.

CASE REPORT DETAILS: A 27 year old male patient reported to the Department of Oral & Maxillofacial Surgery at Swargiya Dadasaheb Kalmegh Smruti Dental college & Hospital, Nagpur with complaints of loss of upper front teeth due to trauma since 2 year back. On detailed intra oral examination revealed that missing teeth on 11, 21 & 22 regions (Figure.1). The patient's overall periodontal condition was healthy. The patient was presented with various treatment options, after discussing the pros and cons of each the following treatment option was agreed upon implant placement in missing area. After proper treatment planning endo-osseous implant (Adin threaded, Life Care Devices Private Limited, Isreal) measuring $3.2 \times 11\text{mm}$, $3.2 \times 11\text{mm}$ & $3 \times 9.5\text{mm}$ for the region 11, 21 & 22 was selected respectively. Surgical stent was prepared for proper angulations of implant (Figure 2).

Following an injection of 2% lidocaine with 1: 80,000 anaesthetic agent in the missing area a palatally positioned full-thickness incision was made and the flap was raised (Figure 3&4). Bone width was measured to following the manufacturer's protocol for implant placement an osteotomy was drilled with the help of the surgical stent (Figure 5 & 6). A parallel sided, threaded, rough surface implant was then placed and primary stability was achieved at 35N. Alloplast bone graft (Periobone G, Top-Notch Health Care Product Pvt. Ltd., India.) was placed and guided tissue regeneration membrane was placed on the labial cortical plate were there was slight bony defect. (Figure.7& 8) the flap was closed with the help of mersilk 3.0 sutures (Figure 9). Appropriate antibiotic (Amoxicillin 500 mg, 3 times daily for 7 days) and analgesic (Ibuprofen 800 mg, every 4 to 6 hours as needed) were prescribed and post operative instructions were given. The patient was seen post-surgically after 1 week for suture removal, no untoward sign or symptom was noted The Healing cap (Hi-Tec HC3 gingival former Life Care Device Private limited, Isreal) was secured on the implant after 20 days

(Figure 11). Six weeks after implant placement the healing abutment was removed cast post was placed and an impression coping placed, followed by a Poly Vinyl Siloxane (Aquasil, Dentsply/Caulk, Milford, DE) open-tray impression to capture the position of the implant. The impression coping was removed and the healing abutment replaced, shade was also recorded. The case was then sent to the laboratory for Ceramic crown & preparation of wax pattern, custom abutment fabrication and metal try done (Figure 12 & 13). The patient was now seen after 6 months. The Ceramic crown was then cemented (Figure.14). The patient was satisfy with the final aesthetic and functional outcome (Figure.15& 16). Oral hygiene instructions were given to patient and recall after every 1 year for regular check up.

DISCUSSION

This case report discussed the key concept of proper treatment procedure, implant surgery, and prosthetic rehabilitation for loading to achieve excellent results in esthetic region. The placement of implant in anterior aesthetic region is a viable treatment option. Maintenance of residual bone, ease of oral hygiene, increased longevity, and reduce change in anatomical structure of adjacent teeth have few benefits of using dental implant in aesthetic zone. Successful implant placement in aesthetic area should met the certain clinical parameters. This is true in the anterior maxilla region where the teeth and their supporting structures are visible and it is one of the most aesthetic demand of patients. Implant placement in anterior aesthetic zone depends preoperative planning of implant selection which include size, shape and a specific surgical plan, and ultimately prostheses are fabricated in consideration of function and soft tissue support. Technical expertise is also essential.

Treatment planning must consider the final prosthetic result, so that implant surgery can be adapted to fulfill the preplanned objectives. Other treatment modalities to our treatment included a removable partial denture (RPD), fixed partial dentures (FPD) and resin bonded bridges (Maryland bridges). Removable partial dentures (RPD) and Cast partial Denture (CPD) while an another good option can contribute to the loss of alveolar bone on both abutment and non-abutment teeth. Alternatively the use of fixed partial dentures (FPD) would have required the unnecessary destruction of adjacent teeth to prepare them as abutments and loss of pristine tooth structure. Another option would be a resin bonded bridge, which would reduce the amount of adjacent tooth destruction but with a high incidence of pontic failure and debonding. The dental implants placement in the anterior maxilla and mandible region was the same, the failure rate in the anterior mandible region was higher while the complications in the anterior maxilla were more pronounced (Berkally, 1993). Fixed dental prosthesis (FPD) is a viable treatment option for replacement of missing teeth but still Dental Implant restoration has definite advantages. It was reported that the survival rates for tooth replacement with single tooth implants was higher (Shenoy, 2012). The use of dental implants in the aesthetic zone is well-documented in the literature, the survival and success rates are similar to those reported for other segments of the jaws in various controlled clinical trials (Tuna, 2011). Minimum time required for restoration is about 4 to 6 month as stated by Prof. Branemark. Compare to other loading protocols conventional loading protocol is a predictable and an accepted treatment modality (Abichandani, 2013).



Fig 1. Preoperative photograph



Fig 2. Stent preparation



Fig 3. Incision

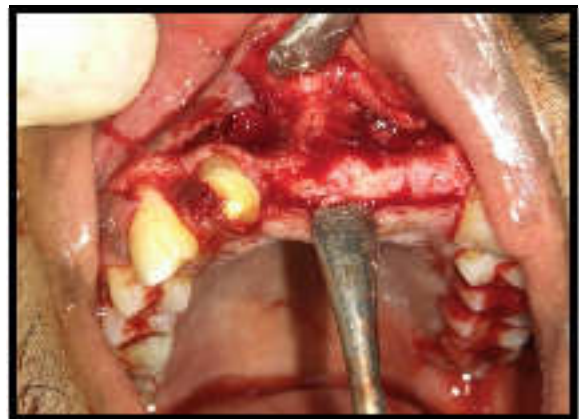


Fig 4. Flap exposure



Fig 5. Adaptation of stent



Fig 6. Pilot drill



Fig. 7. Parallel pin placement & Placement of implant with bone graft



Fig 8.Placement of GTR membrane



Fig 9. Closer of wound



Fig 10. Placement of gingival former



Fig 11. Cast post

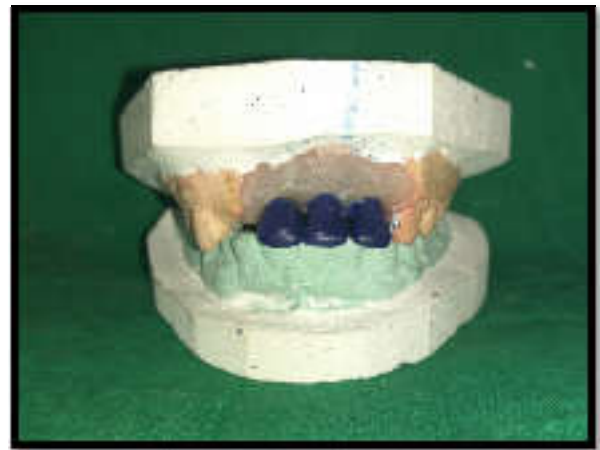


Fig 12. Preparation of wax pattern



Fig 13. Metal try in



Fig 14. Postoperative



Fig 15. Postoperative smile



Fig 16. Postoperative radiograph

In this case report, delayed loading protocol was followed seeing the clinical condition and available bone present at missing teeth to get good treatment aesthetic result. In this case, has many biological advantages such as preservation of the natural dentition and supporting periodontium, improved aesthetics, improved hygiene accessibility, and less long-term costs are compare to traditional implant placement (Tuna, 2011). We felt an Implant would have been one of the best option in Aesthetic zone. Proper prosthetic planning must also be followed to maximize aesthetics and function outcome of this therapy. The surgeons or implantologist must consider the time needed for implant osseointegration after implant placement and soft-tissue healing, creation of emergence profiles, occlusal forces in relationship to progressive loading, and occlusal forces on the final restoration.

Conclusion

Anterior implant cases are among the most difficult to restore, clinicians can achieve a predictable result by thoroughly evaluating patient anatomy and following a clear set of clinical guidelines Utilizing the available diagnostic tools and restorative-driven treatment planning, implants can be placed in a manner that optimizes the final prosthetic outcome and meets the esthetic demands to the patients. This case report has shows the step by step procedure needed to create ideal aesthetics and functional result in the maxillary anterior region.

Appropriate treatment planning allows the Maxillofacial surgeon, working with the restorative dentist, to select location, angulations, and spacing of Dental Implants to achieve ideal aesthetics. The prosthetic postoperative planning of restoration of a Dental Implant must be ideal to achieve the desired aesthetic result in anterior maxillary and mandibular region. This case report discussed the Importance of a Comprehensive as well as Interdisciplinary approach to treatment planning, surgery, and restoration of Dental Implants in the anterior aesthetic zone.

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