



Single Tooth Implant Placement in Anterior Maxilla: A Case Report

Authors

Dr. Rajul Vivek¹, Dr. Romesh Soni²

¹PhD Research Scholar, Faculty of Dental Sciences, Institute of Medical sciences, Banaras Hindu University, Lanka, Varanasi, 221005

Email- rajul8119@gmail.com

²Assistant Professor, Faculty of Dental Sciences, Institute of Medical sciences, Banaras Hindu University, Lanka, Varanasi, 221005

Email – rsoni80@yahoo.com

Corresponding Author

Dr. Romesh Soni

Assistant Professor, Faculty of Dental Sciences, Institute of Medical sciences, Banaras Hindu University, Lanka, Varanasi, 221005

Email – rsoni80@yahoo.com

Abstract

Implant therapy is today widely regarded as a reliable treatment option to replace missing teeth, both for function and esthetics. Dental implants may be used to replace single teeth, replace multiple teeth, or provide abutments for complete dentures or partials. This topic focuses on the placement of single-tooth dental implants. The correct surgical placement of a dental implant is mandatory to obtain the ideal aesthetic result. Only through proper treatment planning can the correct position and number of implants be determined. 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 integration and soft-tissue healing, creation of emergence profiles, occlusal forces in relationship to progressive loading, and occlusal forces on the final restoration.

Key Words – *Implant, Esthetic Zone, Abutment, Prosthesis*

Introduction

Placing dental implants in the esthetic zone is considered to be the ultimate challenge for many dentists. The use of dental implants in the esthetic zone has overcome many of the disadvantages of conventional restorative techniques that used anterior natural teeth as abutments. Professionals aimed at creating an implant-supported restoration that replicated natural teeth.¹ That is why the

single-tooth, implant supported restoration in the anterior region remains a challenge.² Patient acceptance of dental implants in the esthetic zone is increasing due to many factors, including the outstanding results shown in the media. In the past, available bone often restricted placement of implants into areas such as the anterior mandible. Today prosthetic requirements dictate, to a great extent, the placement of dental implants.

Advancements in the field of dental implant therapy have led to predictable survival rates of dental implants.³ The current definition of success in addition to long-term predictability, function and integration of the implant focuses on esthetic considerations.⁴ 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 esthetic result, with some authors ranking function and aesthetics in the anterior maxillary region to be of equal importance.⁵⁻⁸

Bone regenerative materials, soft tissue augmentation techniques, wide temporary healing abutments, natural profile abutments, and tooth colored abutments are the main tools used in the creation of an optimal emergence profile of an implant-supported prosthesis in the esthetic zone. Present case report illustrates implant placement in the maxillary anterior region where there was adequate bone support and soft tissue.

Case Report

A 28 year old male patient presented to the Department of Prosthodontics, Faculty of dental sciences, IMS, Banaras Hindu University with chief complaint of loss of upper front teeth due to trauma since 2 year back. On detailed intra oral examination revealed that missing teeth on 11 regions (Figure.1). The patient's general periodontal condition was healthy, despite the fact that he did not seek regular professional oral hygiene and pocket depths were less than 3mm in all teeth. 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 (Hi-Tec tapered self threaded, Life Care Devices Private Limited, Isreal) measuring 5 × 13 mm in dimension was selected. Following an injection of 2% lidocaine with 1:80,000 anaesthetic agent in the area of the missing central incisor a palatally positioned full-thickness incision was made and the flap was raised

(Figure.2a, 2b). Bone width was measured to be 8mm and following the manufacturer's protocol for implant placement an osteotomy was drilled with the help of the surgical template. A parallel sided, threaded, rough surface implant was then placed and primary stability was achieved at 35N, a healing abutment (Figure.3) was placed on top of the implant and the flap was closed with the help of silk 3.0 sutures. The maxillary transitional enture was relieved to accommodate for the healing and healing cap Healing cap (Hi-Tec HC-3 gingival former Life Care Device Private limited, Isreal) was secured on the implant. 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 (Figure.4).

Six weeks after implant placement the healing abutment was removed 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 (Figure.5). The impression coping was removed and the healing abutment replaced, shade was also recorded. The case was then sent to the laboratory for temporary crown and custom abutment fabrication.

The patient was now seen after eight weeks of healing, at this time the healing abutment was removed and the customized abutment was placed; a radiographic was taken to confirm the seating of the abutment. The abutment was then torqued to 35N with the help of a torque wrench. The temporary crown was then placed, the proximal contacts and occlusion verified. In MI there was light contact with no contact in protrusive and lateral excursions. The temporary crown was then cemented with the help of noneugenol based temporary cement. Excess cement was removed and the occlusion was verified again. After 16 weeks of healing since implant placement the temporary crown was

removed and the gingival was observed for healing, it exhibited an adequate amount of interdental papilla and the buccal contours were observed to be similar to the adjacent tooth.

Final restoration was delivered at 20 week after implant placement. The temporary crown was removed, the abutment cleaned with copious amounts of water and the final crown was then tried in. The proximal contacts and occlusion was checked. The crown was then cemented using a resin modified glass ionomer cement (Figure.6). The patient was very happy with the final esthetic and functional outcome .Oral hygiene instructions were given to patient and recall after 3 months for regular check up.



Figure.1 intra -oral view'



Figure.2a Incision on the site of placement



Figure.2b Flap open



Figure .3 Implant placement



Figure.4 Healing cap placed



Figure.5 Abutment placed



Figure.6 Final Prosthesis

Discussion

This case report discussed the key concepts of treatment planning, implant surgery, and prosthetic rehabilitation needed to achieve aesthetic success in the maxillary anterior region. The use of dental implants in the maxillary anterior region to replace missing teeth is a viable treatment option. There are many benefits of fixed dental implant-supported prosthetics versus traditional crown and bridge or removable tooth-borne prosthetics.⁹ Maintenance of residual bone, ease of oral hygiene, increased longevity, and non-involvement of adjacent teeth are a few advantages of using dental implants. In order to provide successful and aesthetic dental implant treatment, certain clinical parameters must be met. This is particularly true in the anterior maxilla, where the teeth and their supporting structures are readily visible. Successful implant treatment to replace missing teeth in the anterior maxilla requires preoperative planning and a specific surgical plan, and ultimately prostheses are fabricated in consideration of function and soft-tissue support.¹⁰ Technical expertise is also essential. Treatment planning must consider the final prosthetic result, so that implant surgery can be tailored to fulfill the preplanned objectives. Unless the position of the final prosthesis is visualized prior to surgery, the placement of the dental implants may not allow the desired end result to be achieved.¹¹

Alternate treatment modalities to our treatment plan included a removable partial denture, fixed partial dentures and resin bonded bridges (Maryland bridges). Removable partial dentures while an option can contribute to the loss of alveolar bone on both abutment and non-abutment teeth¹² along with that the dissatisfaction rate of removable partial dentures is relatively high, ranging from 9-26%.¹³ On the other hand the use of fixed partial dentures 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 debonding¹⁴ we felt an implant would have been the best option.

Proper prosthetic concepts must also be followed to maximize aesthetics and function. The clinician must consider the time needed for implant integration and soft-tissue healing, creation of emergence profiles, occlusal forces in relationship to progressive loading, and occlusal forces on the final restoration.

Conclusion

Placing dental implant in the maxillary anterior region requires precise planning, surgery, and prosthetic treatment. This case report has illustrated the steps needed to create ideal aesthetics in the maxillary anterior region. Rigorous treatment planning allows the implant surgeon, working with the restorative dentist, to select location, angulations, and spacing of dental implants to achieve ideal aesthetics. The prosthetic restoration of a dental implant must be ideal to achieve the desired aesthetic result. This case report has discussed the importance of a comprehensive and interdisciplinary approach to treatment planning, surgery, and restoration of dental implants in the maxillary anterior region of the mouth.

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