Case Report

Custom anatomic healing abutments

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Abstract

Dental implants with their increasing success rates and predictability of final outcome are fast becoming the treatment of choice for replacing missing teeth. Considering the success of immediate implant placement in reducing tissue loss and achieving good esthetic results, is making it a more popular treatment modality in implant dentistry. Understanding the management of gingival tissues in relation to implants to obtain maximum esthetics is of utmost importance. The use of provisional abutments and immediate temporization has a proven track record of their ability to produce optimal esthetics and to guide the tissue response during the healing phase. With careful patient selection and execution, customized healing abutments can provide an effective method to enhance the esthetic and emergence profile for anterior implant restorations.

Key Words: Esthetics, gingival biotype, healing abutments, temporization

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INTRODUCTION

Dental implants with their increasing success rates and predictability of final outcome are fast becoming the treatment of choice for replacing missing teeth.[1,2] Over the years, clinicians have realized a paradigm shift from osseointegration to esthetic integration. Dental implants have advantages over both conventional fixed and removable prostheses. The preservation of adjacent tooth structures which are lost during other prosthodontic treatment options and their ability to maintain existing alveolar bone are seen as their primary benefits. Considering the success of immediate implant placement in reducing tissue loss and achieving good esthetic results, is making it a more popular treatment modality in implant dentistry.[3]

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CASE REPORT

A 45-year-old female patient reported to the Department of Prosthodontics, V.S Dental College and hospital, with the chief complaint of irregularly placed upper and lower front teeth [Figure 1]. On clinical and radiological examination, the patient was diagnosed with pathological migration of the maxillary and mandibular anterior teeth.

Intraoral examination revealed the soft tissue to be of thin gingival biotype,[4] with the width of keratinized gingiva less in relation to the upper anteriors. Severe spacing was seen between the maxillary anteriors making the gingival margin contours irregular.

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Due to the severity of the migration and the periodontal status of the teeth, the option of a conventional fixed partial denture was ruled out. The patient was given the option of an implant supported fixed partial denture or a removable partial denture. The patient opted for the implant supported fixed partial denture. After the treatment plan was explained to the patient in detail, for the first stage of treatment, it was decided to extract the maxillary central and lateral incisors followed by immediate implant (Hi-tech®, Lifecare®) placement [Figure 2]. Owing to the thin gingival biotype and inadequate width of attached gingiva, platelet-rich fibrin [Figure 3] according to the recommendations by Choukran[5] was also placed post, to obtain a good soft tissue profile and to establish primary closure.

Satisfactory healing at 14 days and at 2 months after implant placement can be seen in Figures 4 and 5.

To obtain an ideal gingival emergence profile and improve the esthetics, healing abutments customized [Figure 6] with micro-filled composite (Charisma® Heraeus dental) were used after the second stage surgery.

The implant abutments were surface treated with sand blasting of 150 μ grit to improve the bonding of the composite to the abutments. The micro-filled composites were highly polished to improve the contour and the emergence profile and also to keep plaque accumulation to a minimum. The custom abutments were placed for a period of 2 weeks after which an acceptable gingival profile was obtained. Presence of stippling in the interdental papilla indicated healthy peri-implant tissue [Figures 7 and 8]. Temporization was carried out with polycarbonate crowns to visualize the outcome of the final prosthesis [Figure 9].

DISCUSSION

Understanding the management of gingival tissues in relation to implants to obtain maximum esthetics is of utmost importance. There is a complex relation among implant position, gingival management at stage-one and stage-two surgery, the position of the gingival margin over the buccal surface of the implant compared to the adjacent natural teeth, component selection, and lip line esthetics. The therapist who understands these relations will know how to mold the gingival tissue around implants to maximize the esthetic result.

The circular shape of prefabricated abutments makes it more unpredictable in molding the tissue to contours similar to that of natural teeth. In this case, to obtain ideal gingival esthetics, the conventional abutments were customized with the help

Figure 1: Pathological migration of maxillary incisors - Preoperative

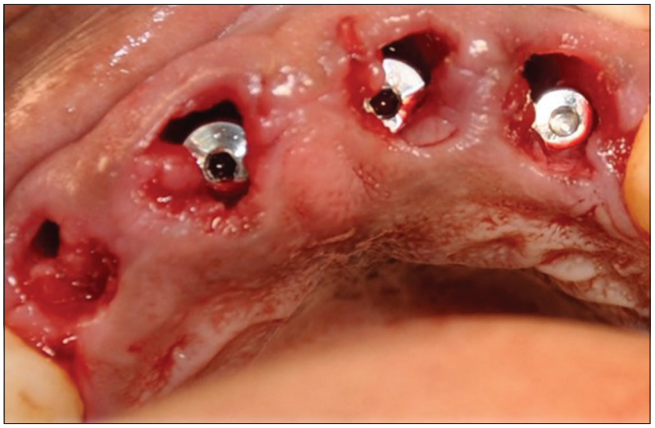

Figure 2: Immediate implant placement in the maxillary anterior region

Figure 3: Platelet-rich fibrin

of micro-filled composites. The shape of the micro-filled composite buildup had to satisfy the emergence profile of a natural tooth. To serve this purpose, 4 abutments were surface treated by sand blasting (150 μ grit) to increase the surface area for better micro mechanical bond between composite and the implant abutment surface. Composite resin was incrementally added to customize the emergence profile specific to the site.

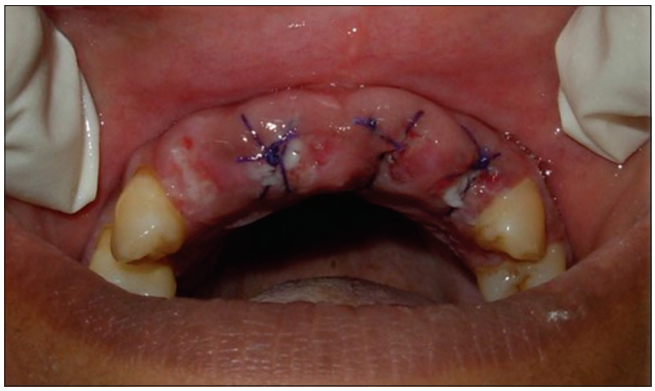

Figure 4: 14 days postoperative

Figure 6: Customized healing abutments with nanocomposites

Figure 8: Well contoured interdental papilla

Micro-filled composite (Charisma® Heraeus dental) was used because of its ability to produce a highly polished surface. This aids in prevention of any microbial colonization by the reduction of plaque accumulation and also being an easily cleansable surface. This would contribute to development and maintenance of healthy peri-implant tissues.

Healthy peri-implant mucosa is important to ensure a good emergence profile particularly in the esthetic zone. It plays a role in preventing peri-implant disease by forming a barrier to efficiently protect underlying bone and prevent access for microorganisms. In addition, after the final restoration, time may be required for soft tissue to fill the embrasure, which is more predictable with healthy tissue.[6,7] Figure 8 shows adequate interdental papilla, well contoured gingiva, and the presence of stippling and no inflammation, indicative of healthy peri-implant tissue.

The main purpose of immediate implant placement is to concentrate on the hard and soft tissues that must be developed during the treatment as it has to reduce the tissue loss following tooth extraction.[8-12]

Figure 5: 2 months postoperative

Figure 7: Healed tissues ready for implant prosthesis

Figure 9: Postoperative interim prosthesis

The use of provisional abutments and immediate temporization have a proven track record of their ability to produce optimal esthetics and to guide the tissue response during the healing phase.[13] However, in this case, due to the migration of the teeth to be extracted and the resultant socket position post extraction, immediate provisionalization would have create a gingival architecture not suited to what was needed in the final restoration. The use of custom-shaped abutments gave us the flexibility to mold the healing gingival tissue to obtain an ideal emergence profile with the permanent restoration in mind.

CONCLUSION

The use of dental implants for replacement of missing teeth has become a predictable treatment modality with high success rates. With careful patient selection and execution, customized healing abutments can provide an effective method to enhance

the esthetic and emergence profile for anterior implant restorations.

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Conflicts of interest

There are no conflicts of interest.

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