

Customized healing abutment for enhancing the emergence profile: A case report.

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Abstract

Introduction: The esthetics of dental implants is dependent on the soft tissue form and emergence profile. The use of healing abutments has a history of producing the best aesthetic results and guiding the soft tissue.

Case description: Healing abutments direct soft tissue recovery in proper shape. The round cross shape of traditional healing abutments and the same gingival architecture they produce might not be ideal for creating an attractive restoration. Therefore, in order to generate the ideal gingival architecture, a customized healing abutment is required. Therefore, in order to improve the aesthetic outcomes of fixed implant-supported restorations, this article aims to provide a simple and inexpensive method for creating an emerging profile.

Discussion: Customized healing abutments are necessary to achieve an ideal gingival shape and visually acceptable restoration, as opposed to ordinary healing abutments. They are an important key to success in implant surgery.

Keywords: Customized healing abutment, dental implant, emergence profile, esthetics.

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Introduction

Dental implants with its rising success rates and predictable end results, are quickly replacing missing teeth as the preferred method of treatment.^[1,2] Additionally, implant prosthodontics ultimate goal is to restore both function and aesthetics. The soft-tissue around implant must be properly controlled during surgical placement, or just before impression formation if we want the optimal cosmetic results. An sufficient aesthetic look must be provided by the restoration for a dental implant to be deemed successful.^[3] According to Branemark, the main goal of implant surgery is to cover it for three to six months so that the bone may mend and restructure around it.^[4] After the first healing period, the success of osseointegration depends on the design of the prosthesis, how often it is cleaned, and how the implant and prosthesis are maintained. However, clinicians have

observed a paradigm shift away from osseointegration and toward aesthetic integration over time. In order for the implant-supported to emerge from the gingival tissue in a manner similar to that of an adjacent natural tooth, the surrounding framework of hard and soft tissues must either be retained at the time of extraction or subsequently regenerated.^[5,6] Osteointegration takes place following the initial healing phase. Healing abutments direct soft tissue recovery in the proper shape during single-stage surgical protocols or after implants have been exposed during two-stage surgical procedures.^[7] The round cross shape of traditional healing abutments and the same gingival architecture they produce might not be ideal for creating an attractive restoration. Therefore, in order to generate the ideal gingival architecture, a customized healing abutment is required.^[8,9] Some doctors have advised the use of custom

healing abutments in order to provide a better emerging profile of the peri-implant tissues. A customized healing abutment can be made by modifying the size and transmucosal contour to approximate the normal profile of a developing tooth.^[10,11] The implant on the body is then attached to it. Depending on the therapeutic uses, several materials and fabrication processes can be used to create customized healing abutments. Custom emergence profile generation, on the other hand, is a time-consuming process that adds to working hours and costs and calls for great clinical dexterity. The method is prevented from becoming the standard by all of these challenges. The right form, size, and direction of the emergence profile that should be rebuilt in an edentulous region can be rapidly, easily, and objectively determined intra-orally with the aid of a range of modern medical technologies. Currently, this process is typically carried out after the implant has been placed and an impression has been taken. Before making the model, the laboratory technician generates the emergence profile and presents it on the working cast.^[12] Therefore, in order to improve the aesthetic outcomes of fixed implant-supported restorations, this paper aims to provide a simple and inexpensive method for creating an emerging profile.

Case report

A 35-year-old male patient presented to the Haldia Institute of Dental Sciences and Research's Department of Prosthodontics and Crown and Bridge with the primary complaint of lost teeth in the right upper back tooth region. A year ago, the tooth was lost owing to cavities. A fixed tooth replacement was desired by the patient. Upon clinical examination, it was discovered that 15 had retained root stump and 16 had partially edentulous space (Figure 1). After conducting an appropriate history, study casts were

created. The patient did not smoke, had a history of managed hypertension, no visible oral disease, and no dental conditions that would have prevented them from receiving implant therapy. The outcomes of the clinical and radiological evaluation made it abundantly evident that there was enough hard and soft tissue to proceed with implant replacement therapy. The patient had two treatment options namely a traditional fixed partial denture or an implant-supported fixed partial denture. The patient made the decision to use an implant-supported fixed partial denture.

For immediate implant placement, a 4.3x11mm implant was chosen to be placed in the site 15, and a 4.2x13mm implant was chosen to be placed in the site 16. Care was taken during the implant procedure to spare 1.5 mm of bone mesiodistally between the implant and the neighboring teeth and 1 mm of buccal and lingual cortical bone (Figure 2). A flapless, non-submerged procedure and instant connection of a healing abutment was recommended to prevent stage-two surgery, and as a result, a punch incision was made during implant placement in case 16 and an osseograft was implanted following immediate implant placement in case 15. After the implant was put in place, healing abutments were put in both locations (Figure 3). Following implant placement in site 16 a prefabricated cylindrical standard healing abutment was used, and following implant placement in site 15 an immediate healing abutment was employed (Figure 4). With 3'0' vicryl suture, flaps were stitched together. To verify a reasonably accurate placement in all three dimensions, an IOPA radiograph was obtained. A course of antibiotics and analgesics were also recommended for the patient. In order to speed up healing, he was told to eat soft foods and refrain from touching the surgery site. On the seventh day, he was called back for the sutures to be taken out. The

patient was recalled after six months and it was observed that an esthetically pleasing gingival cuff has developed (Figure 5 and 6). Impressions were made and temporization was done. Patient was asked to maintain oral hygiene during the entire period of treatment. Final restoration was done using porcelain fused to metal crowns and a final result was an emergence profile which mimicked natural gingival contours (Figure 7 and 8).

Fabrication of customized healing abutment

The healing abutment was specifically designed (Figure 9) with micro filled composite and was used following immediate implant placement to achieve the appropriate gingival emerges improve aesthetics, and note the extracted tooth socket's contours. The abutments were surface-treated with 150-grit sand blasting to improve the adherence of composite to the implant healing abutments. In order to enhance the form, the emergence profile, and to reduce plaque formation, the microfilled composite underwent extensive polishing.

Discussion

The most essential components for an implant therapy that is both visually pleasing and functionally effective is the development and recording of a natural-looking unique emergence profile. It is crucial to comprehend how to control gingival tissues in connection to implants to achieve the best possible cosmetic result. Today, it is usual practice to create emergence profiles that are cylindrical in shape since they are produced by the various implant companies' widely utilized, commercially available cylindrical-shaped standard healing abutments.^[13,14] As a result formation of undercuts in some places and insufficient contact surfaces is present giving it a ridge lap contour. To achieve the best

aesthetic result, it is important to comprehend how gingival tissues should be managed. The most common emergence profile today is one that is cylindrical in shape. A crown with a cylindrical sub-gingival part is designed and made as a result of the emerging profile's cylindrical shape. The crown then develops a ridge lap contour with undercutting in certain places and insufficient contact surfaces with the neighboring teeth as a result.^[15] When the soft tissue cuff is disorganized and the soft tissue profile is not optimal, it is more challenging for clinicians to place abutments, take impressions, and place temporary restorations. To solve the issue, the adoption of a modified healing abutment is advised. There was no need for flap surgery or anesthesia. Patient compliance was good as a result. It was easy to perform the healing abutment modification chair side. When there is a significant difference in the size and shape between the healing abutment and the standard healing abutment, the procedure can be used to various implant systems. Composites can be used to create a highly polished surface. This aids in preventing any microbial colonization due to its easily cleanable surface and less plaque formation. The peri-implant tissues' health would be preserved in this way. Therefore, in terms of soft and hard tissue reaction, ordinary healing abutments are less effective than anatomically shaped and broader custom healing abutments.

Conclusion:

The manufacturing of an anatomically comprehensive restoration is made easier by the customization of the healing abutment, which also improves the prosthesis's emergence profile and aesthetics. This case study describes a simple yet efficient technique for fabricating a unique healing abutment, which also aids in producing a natural shape for the final restoration. Customized healing abutments can be a useful

tool for improving the look and emergence profile for implant restorations with careful case selection and implementation.

References

1. Kan JY, Rungcharassaeng K. Immediate placement and provisionalization of maxillary anterior single implants: A surgical and prosthodontic rationale. *Pract Periodontics Aesthet Dent* 2000;12:817-24.
2. Spear FM. Maintenance of the interdental papilla following anterior tooth removal. *Pract Periodontics Aesthet Dent* 1999;11:21-8.
3. Smith DE, Zarb GA: Criteria for success of osseointegrated endosseous implants. *J Prosthet Dent* 1989;62:567-572
4. Branemark PI: Osseointegration and its experimental ° background. *J Prosthet Dent* 1983;50:399-410
5. Croll BM: Emergence profiles in natural tooth contour. Part I: photographic observations. *J Prosthet Dent* 1989;62:4-10
6. Perel ML: Periodontal considerations of crown contours. *J*
7. Misch CE. *Contemporary Implant Dentistry*, 3rd ed. 1993;31.
8. Pow EH, McMillan AS. A modified implant healing abutment to optimize soft tissue contours: A case report. *Implant Dent* 2004;13:297-300.
9. Wheeler SL, Vogel RE, Casellini R. Tissue preservation and maintenance of Optimum Esthetics: A clinical report. *Int J Oral Maxillofac Implants* 2000;15:265-71.
10. Janakievski J. Case Report: Maintenance of gingival form following immediate implant placement: The custom-healing abutment. *Adv Esthet Interdiscip Dent* 2007;3:24-8.
11. Bain CA, Weisgold AS. Customized emergence profile in the implant crown: A new technique. *Compend Contin Educ Dent* 1997;18:41-5.
12. Al-Juboori MJ. Interdental Implant Papillae Grow up with Temporary Abutment displaced at Monthly Intervals. *J Contemp Dent Pract*. 2015 May 1;16(5):422-6.
13. Bernard JP, Belser UC, Martinet JP, Borgis SA. Osseointegration of Brånemark fixtures using a single-step operating technique. A preliminary prospective one-year study in the edentulous mandible. *Clin Oral Implants Res*. 1995 Jun;6(2):122-9.
14. Collins JR, Berg RW, Rodríguez M, Rodríguez I, Coelho PG, Tovar N. Evaluation of human periimplant soft tissues around nonsubmerged machined standard and platform-switched abutments. *Implant Dent*. 2015 Feb;24(1):57-61.
15. Wang JH, Judge R, Bailey D. A 5-Year Retrospective Assay of Implant Treatments and Complications in Private Practice: The Restorative Complications of Single and Short-Span Implant-Supported Fixed Prostheses. *Int J Prosthodont*. 2016 Sep-Oct;29(5):435-44.

FIGURES



Figure 1



Figure 2



Figure 3



Figure 4



Figure 5



Figure 6



Figure 7



Figure 8



Figure 9