



AESTHETICS USING ZIRCONIA ABUTMENT WITH TITANIUM BASE: A CASE REPORT

Dr. Rubina Tabassum

Professor and P.G. Guide. Department of Prosthodontics. Department of Prosthodontics. D.Y.PATIL (Deemed to be University) School of Dentistry

Dr. Ankita Chitnis

Lecturer. Department of Prosthodontics. Department of Prosthodontics. D.Y.PATIL (Deemed to be University) School of Dentistry

Dr. Kunal Mehta

Associate Professor. Department of Prosthodontics. Department of Prosthodontics. D.Y.PATIL (Deemed to be University) School of Dentistry

Dr. Simran Khan

Postgraduate students. Department of Prosthodontics. D.Y.PATIL (Deemed to be University) School of Dentistry

Dr. Monika Yadav

Postgraduate students. Department of Prosthodontics. D.Y.PATIL (Deemed to be University) School of Dentistry

Dr. Anoushka Banerjee

Postgraduate students. Department of Prosthodontics. D.Y.PATIL (Deemed to be University) School of Dentistry

Abstract:

Since tooth loss causes bone resorption and gingival architecture to collapse, implant placement in the maxillary anterior area presents the most cosmetic hurdles in the field of implant dentistry. This results in compromised aesthetics and insufficient bone for implant placement. Immediate implant placement into a fresh extraction socket results in shorter surgery time, low cost and maintains the aesthetics of the gingiva, and improves patient comfort. Restoration of dental implants requires implant abutments as a key component. In order to address problems with previous abutments, like the unattractive appearance of titanium abutments and the ceramic abutments with low fracture strength, titanium base abutments were introduced. Zirconia is a widely used aesthetic replacement material for implant abutments because of its excellent tissue compatibility and lack of toxicity. The usage of zirconia parts with a bonded metal part attached to the implant helps in preventing the abutment. This case report is presented with a aim of demonstrating how zirconia abutments can provide optimum aesthetics.

Keywords: Zirconia Abutment, Titanium base, implants

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Introduction: Due to their high clinical survival rates, Osseo integrated dental implants have been shown to be the best treatment option for replacement of missing teeth's oral function and aesthetics (1). Implant-supported restorations are attached to the implant body using implant abutments. Based on various clinical circumstances, a variety of materials and fabrication methods have been used to fabricate implant

abutments. Prefabricated titanium abutments are the most widely utilised kind since they have a straightforward process and are less expensive than other kinds. These abutments, however, might only be appropriate for cement-retained restorations, situations where implants are placed perfectly, and situations where the emergence profile, depth, and diameter of the repaired edentulous area are appropriate. Custom



abutments can be milled using computer-aided design/computer-aided manufacture (CAD/CAM) technology or cast utilising metal alloys. They enable the manufacture of a fixed prosthesis with the appropriate thickness and offer excellent strength, long endurance, and prosthesis that are either cemented or screw-retained. Despite their beneficial qualities, these abutments are rarely used because of their difficult production, high cost, and unattractive appearance (1). Products with higher performance, more design flexibility, and improved applications have been developed in response to the increasing patient demand for improved aesthetics. Gray metal can be seen through peri-implant tissues with thin, clear mucosa in many implants, which is a drawback. Therefore, it has been stressed how crucial implant colour is in the cervical region (2). Losing a tooth in the aesthetic zone is traumatising. Therefore, one of the most difficult scenarios a clinician faces in the aesthetic zone is replacing a single tooth with an implant-supported prosthesis (3).

Case Report: A 35-year-old man reported to the Department of Prosthodontics, D. Y. Patil University School of Dentistry, Navi Mumbai, with a chief complaint of fractured tooth in the upper anterior region and wants replacement for the same (figure 1). Clinical and radiographic examination revealed missing upper left permanent central incisor with remaining root piece. The patient had a history of trauma 2 years back.

Treatment options were extraction of root piece followed by placement of implant. Other than implants, the treatment option included extraction of root piece followed by fixed partial denture, which involves reduction of adjacent tooth structure which was not an optimum option. The patient was explained about both the options and he agreed for implant placement and the surgery was planned followed by a CBCT.

The fractured tooth was extracted atraumatically followed by a local anaesthetic

injection that contained 2% lidocaine and 1:80,000 epinephrine (Lignox). Under saline wash, the extraction socket was completely debrided. To prepare the osteotomy site, drilling was done in stages. Dental Implant (Bredent) with dimension 4.5 x12 was placed. Since there was a buccal defect in the anterior region (figure 2), bone graft (Bio-oss) was placed between the buccal plate and the implant facial surface (figure 3) followed by connective tissue graft from the palate. After surgery, an intraoral periapical radiograph confirmed the implant's position. The patient was recalled after 3 months. Clinical examination showed recession in the buccal aspect. The patient was informed about the second surgery for soft tissue augmentation; however, he did not agree for the second surgery. he had a low smile line; hence the cervical portion was not visible in his smile. The mesiodistal width available for the restoration was much more compared to the adjacent central incisor. A wax mock up was done on the diagnostic cast (Figure 4) and a veneer was planned for the adjacent central incisor so as to compensate for the space available (figure 5).

Second stage surgery was performed for the patient and he was recalled after 2 weeks. Implant impression was taken using open tray technique and was sent to the lab for fabrication of custom zirconia abutments with titanium base which was tried-in first on the implant (figure 6); proper seating was confirmed with a periapical radiograph. The custom abutment was sent to the laboratory for the fabrication of lithium disilicate glass-ceramic crown. Occlusion was verified once more and the emax crown was bonded to the zirconia abutment (figure 7). Follow-up was conducted at intervals of 3 months. The patient had no concerns about the implant restoration, which was also aesthetically acceptable.

Discussion: Zirconia is now employed in implant superstructures where it can pierce the oral mucosa due to its very high strength



and white color. Zirconia restorations suffer from a common issue with all ceramic restorations: tiny fractures caused by occlusal and lateral stresses. In comparison to all-zirconia abutments, the implant platform with cement-retained zirconia abutments with a titanium base sustains less damage because of the titanium abutment and the fixture connection. The need for more advancement has reached the realm of abutment design, which uses titanium as the strong superstructure at the link between the dental implant fixture and abutment. The zirconia sleeve and titanium base interface has emerged as a new area of particular concern, in addition to the contact between abutment and fixture, indicating that this is not ideal an ideal system in terms of zirconia's strength and adhesion to titanium. The link between zirconia and titanium should be trouble-free because this area penetrates the oral mucosa, which separates the oral cavity from alveolar bone. Therefore, it is crucial to create the most secure zirconia and titanium attachment at the margin in order to provide optimum adhesion between the titanium base and zirconia sleeve (2). The aesthetic outcome may be compromised if titanium abutments are utilised in conjunction with ceramic crowns in specific clinical settings because they might cause an unsightly blue tint in the tissues (4). Because the edge margin of the

zirconia abutment is in the subgingival area of the implant, the interface between zirconia abutment and titanium interface has become a concern. The adhesion between the abutment and the titanium base component is crucial because if a separation is made in this area, it can lead to peri-implant diseases (5). Today, zirconia "hybrid" abutments—in which a zirconia body is luted in the lab to a short titanium connecting feature, often called a titanium base—are advised more commonly. With the implant platform, these abutments provide a titanium-to-titanium interaction. These abutments can be utilised with the same screws that are used in titanium abutments (6).

Conclusion: It can be difficult to restore a dental implant in the aesthetic area if the metal abutment is seen through soft tissues in the area . This is a common issue when implants are placed labially or superficially in the alveolar bone. Patients with thin gingival biotypes or after crestal bone resorption around the dental implants may also have this issue. In addition, it can be challenging to conceal a low-quality metal abutment when aesthetic requirements call for the use of ceramic crown material. Commercially pure titanium implant abutments have been shown to be biocompatible and to have adequate mechanical qualities for long-term fixed implant-supported dental prostheses.



Figure 1. Pre-Operative photograph



Figure 2. Flap raised, buccal bone defect evident



Figure 3. Bio-Oss Bone Graft



Figure 4. Wax mockup done



**Figure 5. Intra oral Post operative view w.r.t. 21,
Veneer preparation w.r.t. 11**



Figure 6. Try-in of the Zirconia Abutment



Figure 7. Final cementation of the Emax veneer w.r.t 11 and emax crown w.r.t. 21

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