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Case Report

A Simplified Innovative Lab Technique to Access Implant Abutment Screw Hole Using Visible Light Cure Resin Template in Maxillary Anterior Cement Retained Implant Supported Prostheses

Dr Pravin E Raipure* and Dr Ravindra S Pawar
Assistant Professor, Department of Prosthodontics, Nair Hospital Dental College, Mumbai-400008, India

***Corresponding author:** Dr Pravin E Raipure, Assistant Professor, Department of Prosthodontics, Nair Hospital Dental College, Mumbai-400008, India
Email: drpraveenrai@gmail.com

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Abstract

Introduction: A simplified technique to remove a maxillary anterior cement-retained implant-supported crown by using an abutment screw-access guide fabricated from visible light cure resin is described.

Method/Technique: The present technique is demonstrated on the working model of a patient whose implant is placed tilted in maxillary left lateral incisor region and the screw access opening of abutment is located on the labial surface of final restoration. This technique demonstrates the fabrication of customized guide which accurately locates the position of the implant abutment screw access opening, using visible light cure resin template.

Clinical Significance: The technique is very less time consuming and cost-effective. The present technique helps in accurate direction, location and alignment of the implant abutment screw access in cement retained implant prostheses using visible light cure resin template, without damaging the overall structure of implant crown.

Introduction

Most of the maxillary anterior screw retained implant prostheses possess a challenge due to unaesthetic appearance of the screw access opening on labial aspect of crown. In tilted or angulated abutment cases in maxillary anterior region, we generally prefer cement retained prostheses as it is beneficial with respect to esthetics, occlusion, cost, passive fit, and reduced chair time [1]. In longer run, if the abutment screw loosens or if crown needs repair, then we have to locate the screw access hole to remove the crown without damaging its structure [2]. In cement retained prostheses, the crown frequently remains cemented to the abutment so the abutment screw must then be accessed through the crown to remove the prostheses safely. So the main challenge lies in locating the screw access hole without damaging the implant superstructure [3]. Many authors have illustrated methods for locating screw access hole, such as reviewing an implant radiograph and estimating the screws long axis position, using the photograph before the crown is cemented to record the position of the abutment [3-5]. Some have demonstrated a porcelain stain to mark the screw access point during fabrication, whereas marking the screw access point can be beneficial in posterior restorations but when it comes to anterior restorations it will look unaesthetic [6]. Many authors described techniques to fabricate a vacuum formed guide or template over the final restoration [7,8]. Cone-beam computed tomography (CBCT) has become more popular recently to fabricate the template or guide to locate the screw access opening of implant abutment using digital work flow [9]. However, there are certain limitations in printing and milling 3D model template for locating screw access hole which includes the acquisition of data and processing of images in the hard and soft tissues, and the variety of parameters involved in manufacturing processes which may introduce errors in the accuracy of the resultant models and not to mention the additional cost required for milling and printing [10].

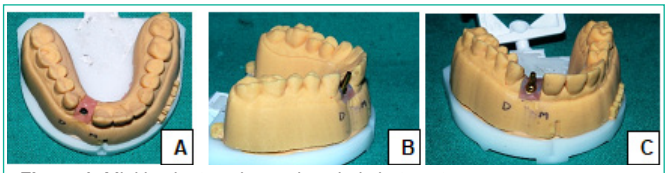

Figure 1: Mini implant analog and angled abutment.

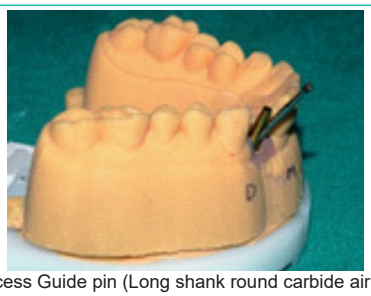

Figure 2: Access Guide pin (Long shank round carbide air motor bur used as guide pin) placed in screw access hole.

Figure 3: Oversized wax pattern crown with access guide pin in place.

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Figure 4: Plastic guide sleeve fitting onto access guide pin.

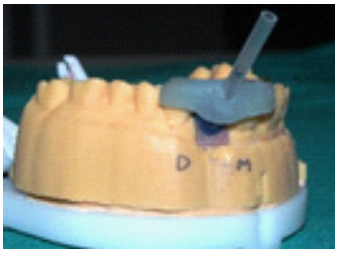

Figure 5: Visible light cure resin sheet adapted to give it a unique simplified design.

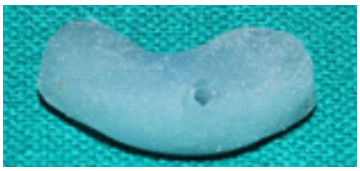

Figure 6: Visible light cured resin template without the guide pin and plastic sleeve reduced at appropriate length.

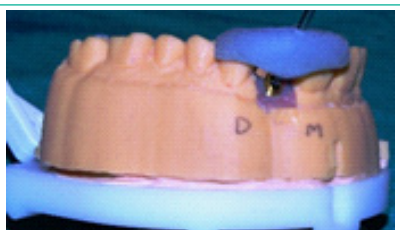

Figure 7: Final visible light cured resin template on model showing the verification of direction and alignment of the abutment screw access hole with guide pin ((long shank round carbide air motor bur).

Meanwhile, none of the techniques demonstrated the use of visible light cure resin sheet to fabricate a template to access abutment screw hole opening in cement retained implant prostheses. Visible light cure resin sheet is easily moldable and adaptable on the cast and can be added and subtracted very easily which is the key advantage of our technique. The present article describes a simplified and cost-effective technique to locate a screw access opening of angulated implant abutment in maxillary anterior cement retained crown using the visible light cure resin template.

Technique

1. The maxillary working model of a patient was selected where implant was placed in left lateral incisor region (Osstem 3.5 mm). The angulated abutment was selected accordingly for the given implant (Figure 1).

2. Place an access guide pin (long shank of round carbide air motor bur is used in this demonstration) accurately into the abutment screw hole so that the patency of screw access hole is maintained (Figure 2). Fabricate the oversized wax pattern of about 0.5 mm of actual size of PFM crown with blue inlay wax (Crown wax hard blue: 40111 Bego, Germany) over the given abutment (Figure 3). The same round carbide air motor bur can be used to retrieve the abutment screw in future if screw loosening happens. The purpose of oversized wax pattern is to accommodate any discrepancy in the final crown size and to ensure easy fit of template over the final crown.

3. Overlying the extended guide pin, place a plastic guide sleeve which fits into guide pin. This will help us maintaining the accurate location and direction of the screw access hole (Figure 4).

4. Now place the visible light cure resin sheet (Individo ^{R} Lux CE Cuxhaven: Germany) over the oversized wax pattern crown on maxillary left central incisor and sheet is adapted uniformly over the wax pattern crown area and adjacent tooth on either side, extending along the plastic guide sleeve and on labial and palatal side to give it a unique template design (Figure 5). After ensuring the resin sheet is completely adapted uniformly in all desired area, light cure the sheet thoroughly in all area.

5. Remove the visible light cure resin template from model carefully having extended screw access plastic guide on the labial aspect of the maxillary left central incisor and then reduce the length of the plastic sleeve at a desired location (Figure 6).

6. Remove the guide pin inside the extended enclosed plastic guide sleeve and patency of screw access guide hole is checked. For verification of the positioning of screw access hole, the final guide template is placed onto the maxillary model over the implant abutment and the abutment screw is accessed through extended guided sleeve of the template on the labial aspect and the direction and alignment is confirmed (Figure 7).

7. After the final crown is fabricated, the final guide template is placed over the model ensuring the easy fit over it and kept ready for future to access the location and alignment of abutment screw hole if loosening happens.

Discussion

Abutment screw loosening is a most common complication of implant prostheses [11-14] but when it comes to cement retained implant prostheses it becomes more challenging to remove the prostheses without any damage, by locating precisely the direction and position of abutment screw. Several methods for removing cement-retained restorations with special mechanical devices have been reported [15-17]. The present technique helps in accurate direction, location and alignment of the implant abutment screw access in cement retained implant prostheses using visible light cure resin template, without damaging the overall structure of implant crown with minimum time required for procedure. In this technique, the oversized wax pattern fabricated before final crown ensured easy fit of the crown and compensated for the discrepancy in final crown size within the resin template. Moreover, the guide pin was secured in placed while making oversized wax pattern which additionally helped us maintaining the accurate direction and alignment of the abutment screw access hole when final crown was in place.

The present technique has some limitations as the fabrication of guide was done on the maxillary model of a patient, which may differ in actual clinical scenario intraorally. The above template can

very well be fabricated in the lab itself by the clinician or by the lab person, but this technique can serve as a base to simulate directly in the patients mouth clinically. The clinical challenges in performing the above technique are questionable. The guide template is based on the adjacent tooth position, and there are chances that over the time, the shape or position of adjacent teeth may change due to periodontal disease, or orthodontic treatment, which might affect the accuracy of the guide template. Moreover, there are chances of shrinkage of the resin over the time, which might affect the stability of template. Since this technique was fabricated on the patient's model and tested, the limitations of the present technique can be explored by doing it intraorally in the patients mouth directly.

Summary

Within the limitation of the present technique, the customized visible light cure resin template helps in accurately locating the screw access channel with minimal damage to the crown and abutment in a simplified and cost-effective way.

References

1. Wadhwani, C, & Chung, K.-H. Simple device for locating the abutment screw position of a cement-retained implant restoration. J Prosthet Dent. 2013; 109: 272–274.
2. Michalakis KX, Hirayama H, Garefis PD. Cement-retained versus screw-retained implant restorations: A critical review. Int J Oral Maxillofac Implants. 2003; 18: 719-28.
3. Patil PG. A technique for repairing a loosening abutment screw for cement-retained implant prosthesis. J Prosthodont. 2011; 20: 652-5.
4. Daher T, Morgano SM. The use of digital photographs to locate implant abutment screws for implant-supported cement retained restorations. J Prosthet Dent. 2008; 100: 238-9.
5. Figueras-Alvarez O, Ceden˜o R, Cano-Batalla J, CabratosaTermes J. A method for registering the abutment screw position of cement-retained implant restorations. J Prosthet Dent. 2010; 104: 60-2.
6. Schwedhelm ER, Raigrodski AJ. A technique for locating implant abutment screws of posterior cement-retained metal ceramic restorations with ceramic occlusal surfaces. J Prosthet Dent. 2006; 95: 165-7.
7. Tarlow JL. A modified technique to locate the abutment screw access opening of a cemented implant-supported restoration. J Prosthet Dent. 2012; 108: 58-9.
8. Lautensack J, Weber V, Wolfart S. Template to determine the position and angulation of the abutment screw channel for implant-supported, cement-retained restorations. J Prosthet Dent. 2012; 107: 134-6.
9. Albiero AM, Benato R, Momic S, Degidi M. Implementation of computer-guided implant planning using digital scanning technology for restorations supported by conical abutments: A dental technique. J Prosthet Dent. 2018; 119: 720-6.
10. Etemad-Shahidi Y, Qallandar OB, Evenden J, AlifuiSegbaya F, Ahmed KE. Accuracy of 3-dimensionally printed full-arch dental models: A systematic review. J Clin Med. 2020; 9: 3357.
11. Goodacre CJ, Bernal G, Rungcharassaeng K, Kan JY. Clinical complications with implants and implant prostheses. J Prosthet Dent. 2003; 90: 121-32.
12. Jung RE, Zembic A, Pjetursson BE, Zwahlen M, Thoma DS. Systematic review of the survival rate and the incidence of biological, technical, and aesthetic complications of single crowns on implants reported in longitudinal studies with a mean follow-up of 5 years. Clin Oral Implants Res. 2012; 23: 2-21.
13. Gracis S, Michalakis K, Vigolo P, Vult von Steyern P, Zwahlen M, Sailer I. Internal vs. external connections for abutments reconstructions: A systematic review. Clin Oral Implants Res. 2012; 23: 202-16.
14. Ma S, Fenton A. Screw- versus cement-retained implant prostheses: A systematic review of prosthodontic maintenance and complications. Int J Prosthodont. 2015; 28: 127-45.
15. Okamoto M, Minagi S. Technique for removing a cemented superstructure from an implant abutment. J Prosthet Dent. 2002; 87: 241-2.
16. Chee WW, Torbati A, Albouy JP. Retrievable cemented implant restorations. J Prosthodont. 1998; 7: 120-5.
17. Clausen GF. The lingual locking screw for implant-retained restorations aesthetics and retrievability. Aust Prosthodont J. 1995; 9: 17-20.