SIMPLE DEVICE FOR LOCATING THE ABUTMENT SCREW POSITION OF A CEMENT-RETAINED IMPLANT RESTORATION

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Cement-retained implant restorations have been reported to have several advantages over their screw-retained counterparts, especially with respect to esthetics, occlusion, cost, passive fit, and reduced chair time.[1,2] However, there are occasions when the cement-retained restoration requires removal, for example, if the abutment screws loosen or if the restoration needs repair.[3,4] In this instance, the crown frequently remains cemented to the abutment. The abutment screw must then be accessed through the crown. The challenge here is to locate the screw position with minimal damage to the restoration, abutment, and possibly implant. Several authors have reported techniques to achieve this, which include reviewing a radiograph of the implant position and estimating the long axis position of the screw,[5] using photography to record the position of the abutment before the crown is cemented,[6,7] marking the screw access site with a porcelain stain during fabrication,[8] or fabricating a vacuum-formed guide or template over the definitive restoration.[9,10] The problems associated with these techniques are clear. Estimating the implant position in 2 dimensions either with radiographic or photographic records is inaccurate.[5-7] Marking the screw access point may be useful in nonesthetic areas but has limitations with an anterior restoration.[8] This article describes the procedure for fabricating a custom-made and precision implant-locating device (PILD) to record the access position of the abutment screw. It is simple, rapid, inexpensive, and gives 3-dimensional information for guiding directional screw access.

PROCEDURE

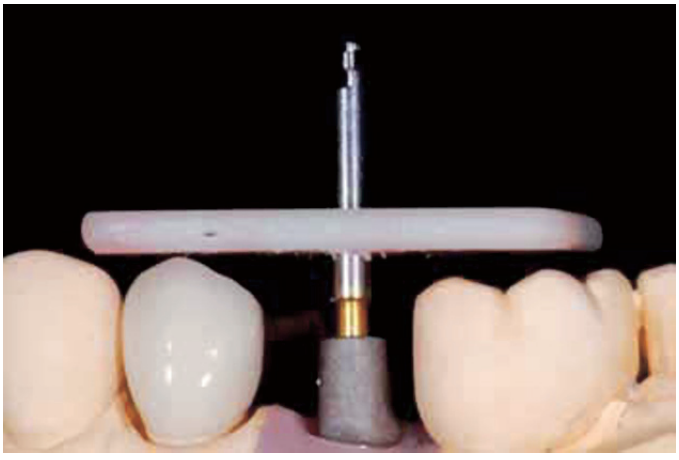
1. Fabricate a 25 × 10 × 2.7 mm flat plate with either provisional or custom tray material (Triad TruTray; Dentsply Intl, York, Pa) and place in a light-polymerizing unit (Triad 2000; Dentsply Intl) for 2 minutes.

2. Prepare a hole approximately 2.1 mm in diameter with a #7 round carbide bur (Brasseler USA, Savannah, Ga) perpendicular to the center of the plate. Place several depressions with a #2 round carbide bur (Brasseler USA) to create retentive elements on the underside of the plate.

3. Select and insert into the plate the appropriate screwdriver, which acts as a guiding rod, for the given implant system. Note that the plate orifice is designed such that the rod is held perpendicular to the horizontal plane of the plate.

4. Locate and engage the abutment screw head with the implant screwdriver, then rotate the plate around the guiding rod, which will be used to index the plate so that the rod aligns with the teeth on either side of the implant restoration. Maintain a space of approximately 1 to 2 mm between the occlusal surface and the indexing teeth (Fig. 1).

5. Apply impression tray adhesive (VPS Tray Adhesive; Kerr Co,



1 Plate and guide rod engage abutment screw head on cast, with plate lowered and oriented to buccal of adjacent teeth.

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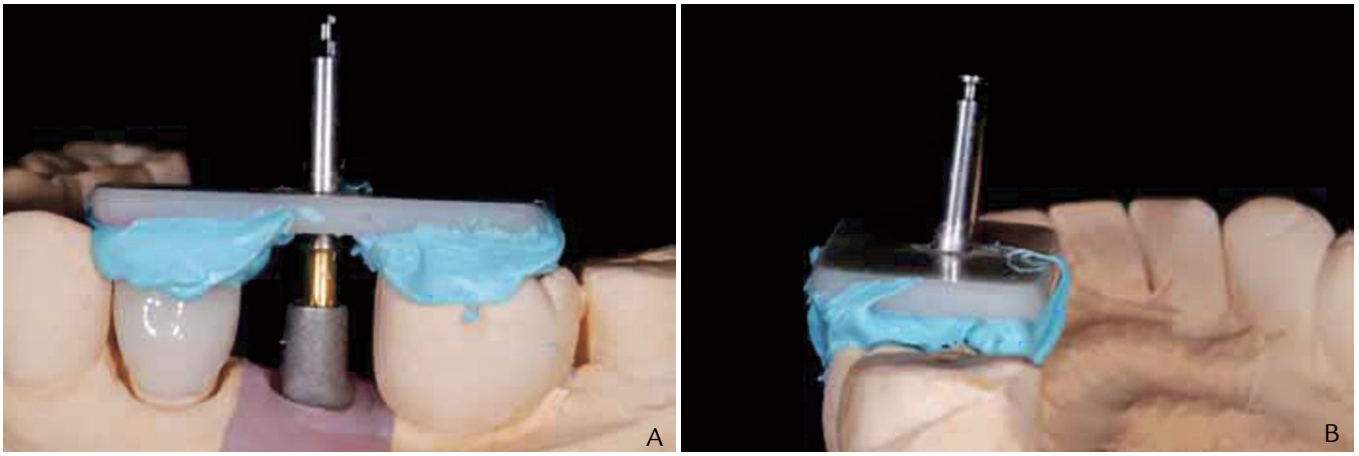
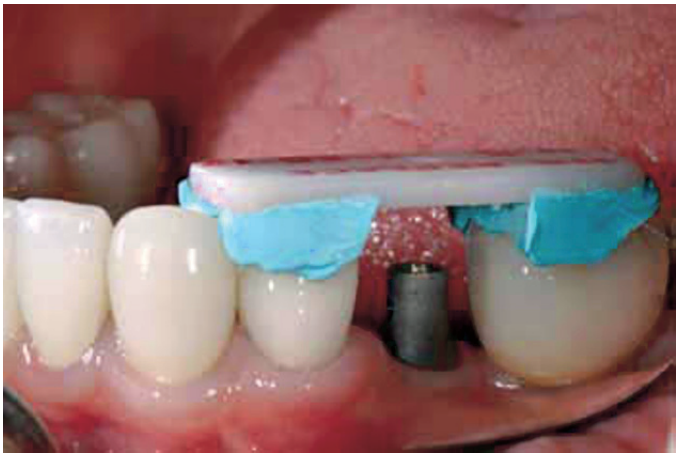
(J Prosthet Dent 2013;109:272-274)



2 A, Heavy-body occlusal registration material applied between occlusal surface of teeth and plate. B, Note axial inclination of guide rod in lateral view.



3 Buccal view of completed precision implant-locating device marked with information of implant type, size, and date. Note embrasure areas are clear so as not to interfere with the cemented restoration.

Orange, Calif) to the retentive surface of the plate and allow it to dry for 30 seconds.

6. Apply a fast-setting, heavy-body occlusal registration material (Blu-Mousse; Parkell Inc, Edgewood, NY) with a fine tip in the space between the inferior side of the plate and the indexing teeth (Fig. 2).

7. Allow the material to polymerize, remove the PILD from the cast, and remove the guiding rod. Ensure that indexing material has not encroached on the implant restoration site. If it has, trim the occlusal registration material, especially at the site that corresponds to the proximal embrasure areas (Fig. 3).

8. Complete the fabrication of the restoration. Place the restoration on the abutment and confirm that the PILD locates easily and is stable. Ensure the guide rod hole of the plate is unobstructed. Place information relative to the implant, such as type, size, and date restored, on the upper surface of the plate with a permanent marker.

9. Disinfect the PILD and store it with the patient's records.

10. Once the implant crown has been cemented, if the screw needs to be accessed, place the PILD on the adjacent teeth to readily and precisely identify the position of the screw access as well as the axial inclination of the implant.

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NOTEWORTHY ABSTRACTS OF THE CURRENT LITERATURE

A randomized, prospective, open-ended clinical trial of zirconia fixed partial dentures on teeth and implants: interim results

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Int J Prosthodont 2012;25:221-31

Purpose: The aim of this randomized controlled clinical trial was to compare the outcomes of zirconia crowns and fixed partial dentures (FPDs) supported by teeth or implants.

Materials and Methods: Patients were recruited based on inclusion/exclusion criteria, and 59 eligible subjects were assigned randomly to treatment by one of four zirconia systems (Cercon, ZirkonZahn, Lava, and Katana). One hundred seven single-tooth and 160 three- to six-unit FPDs were fabricated on teeth and implants and cemented using composite resin cement. Californian Dental Association (CDA) quality evaluation, Plaque Index, and Gingival Index scores were recorded, and radiographic assessment of the restorations was performed using periapical and panoramic radiographs at baseline and annually up to 4 years.

Results: Five failures (1.9%) were recorded. The 4-year Kaplan-Meier survival probabilities of FPDs were higher than those of single-tooth restorations ($P = .046$). The highest survival probability for crowns was observed for Katana and the lowest for Cercon ($P < .05$). For FPDs, the survival probabilities of Lava restorations were similar to those of Cercon but lower than those of ZirkonZahn and Katana ($P < .05$). The 4-year survival probabilities of implant- and tooth-supported crowns were comparable ($P = .182$). Regarding CDA ratings, the slight marginal discrepancy scores for the Cercon restorations were higher than for the other systems at 1 year ($P < .05$). In FPDs, 94.5% of Katana FPDs had slight or gross color mismatch scores, and the difference between color and surface ratings among zirconia systems was significant ($P < .05$). FPDs had better periodontal scores than crowns over the 4-year observation period ($P < .05$).

Conclusion: The 4-year interim results of this study suggest that zirconia systems used to fabricate FPDs have predictably high survival rates on teeth and implants and may exhibit differences, particularly in terms of mechanical failures, marginal adaptation, and color matching.