

Easy Technique to Locate the Screw Within a Cement-Retained Implant-Restoration— The Precision Implant Locator Device (PILD).

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Cement-retained implant-restorations provide the clinician with many valuable advantages, such as esthetics and occlusion, as well as being a process (cementing a restoration) that dentists have been using for over a hundred years.

However, problems with implant restorations do occur, such as screw loosening, fracture of porcelain, or the need to remove the restoration to access the implant for hygiene or to treat peri-implant disease.

Removal and retrievability of the restoration can then be problematic. Even when so-called provisional or temporary cements are used, there is no guarantee the crown or bridge can be easily removed. In some instances removal is impossible and the crown must be removed by first locating the screw access channel, then drilling into it to remove the screw holding on the abutment and crown.

The challenge for the dentist is to find and open the channel with the absolute least destruction possible. This may at least allow the restoration to be repaired and be reused. Several techniques such as using an X-ray film, photographs, and even tattooing the crown at the access site have been suggested. However, all of these involve some guess work to the site as well as the directional angle needed for the drill to cut. In some situations “guessing” the site to be opened will be so far off, that the damage destroys the abutment and in some instances it has been reported that the implant head itself was also damaged to the extent that the implant could no longer be restored. Particular care must be taken with Zirconia abutments, as even the slightest damage may be catastrophic.

With the help of [Blu-Mousse®](#), an implant screwdriver and a simple plastic device, a directly located (site and angle and directional), minimal access channel resulting in least possible damage can be made. The device acts as a 3-dimensional guide or jig that has recorded the screw access channel site in the form of its trajectory.

How to make the Precision Implant Locating Device (PILD)—

Steps:

1. Use a piece of flat, rigid plastic with dimensions about 25mm long, 10mm wide and 3mm thick.
2. In the center of the plastic plate prepare a hole 2.1mm in diameter (this is the size of a latch grip bur used by most implant companies for their screwdriver shanks). The hole must be perpendicular to the plate (Fig. 1).

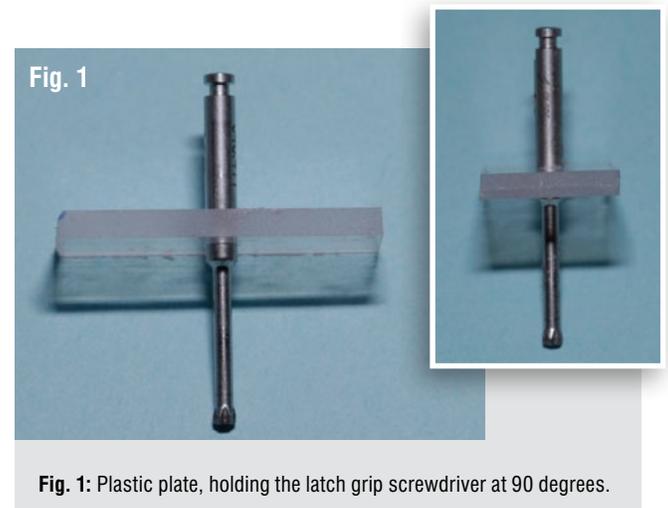


Fig. 1: Plastic plate, holding the latch grip screwdriver at 90 degrees.

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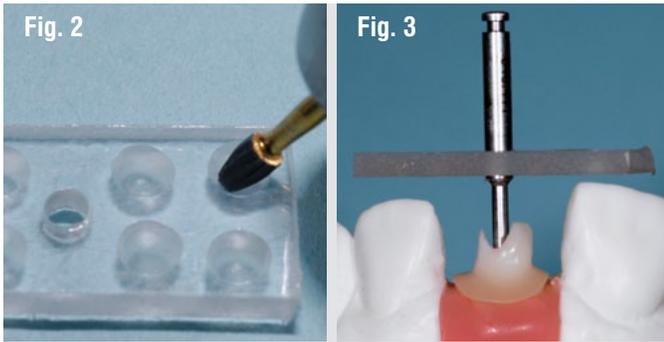


Fig. 2: Place retention dimples on one side of the plate- the “underside”
Fig. 3: PILD in place checking for position, not touching the model.
 The screwdriver has the same trajectory as the long axis of the implant.

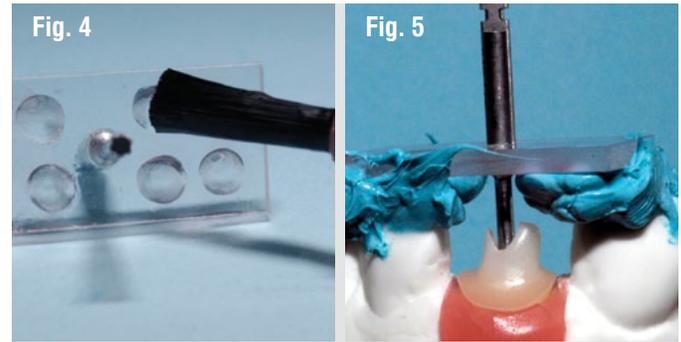


Fig. 4: PILD underside. Note retention dimples. Adhesive has been applied, screwdriver engages underside. **Fig. 5:** PILD in use—the screwdriver is a trajectory of the implant long axis. Blu-Mousse provides the indexing media for adjacent sites

3. On the underside of the plate, make some retention pits or dimples using a bur (Fig. 2).
4. Place the appropriate screwdriver shank into the hole of the plate. **Note:** It should fit snugly and project out at right angles to the plate. The screwdriver engaging side should project out from the underside. (**Tip:** Unworn screwdrivers and new screws are essential for complete engagement).
5. Place the screwdriver and plate assembly onto the implant model with just the implant abutment in place. Engage the screw with the screwdriver and rotate the plate so it aligns and covers the adjacent sites that will be indexed. Ensure sufficient vertical space exists between all the occlusal surfaces (about 0.5-1mm) and the underside of the plate. (Fig. 3)
6. Apply polyvinyl siloxane adhesive agent onto the retention dimples on the underside of the PILD (Fig. 4).
7. Apply Blu-Mousse to both sides of the screwdriver, directly onto the dimples. (**Tip:** use a slightly smaller extruder to control how much is expressed.)
8. Quickly seat onto the model, ensure the driver has locked itself correctly into the screw head, allow to set (Fig. 5). (**Tip:** When first trying this, use Classic Blu-Mousse, not Super-Fast!)
9. Remove the index, remove the screwdriver, now try the PILD device to check it is stable.
10. Finally, make sure that the device will fit correctly when the restoration is put on the abutment (Fig 6). If not, clean the embrasure areas next to the crown as the Blu-Mousse may be preventing it from seating at this site. (**Tip:** a sharp surgical blade does this nicely [Figs. 6-6A]. If you feel you would like to make the PILD even more stable, add a little more Blu-Mousse to the area of the crown (Fig. 7). Finally, using a blade, trim the PILD carefully (Fig. 8) (**Tip:** do not block the trajectory hole).

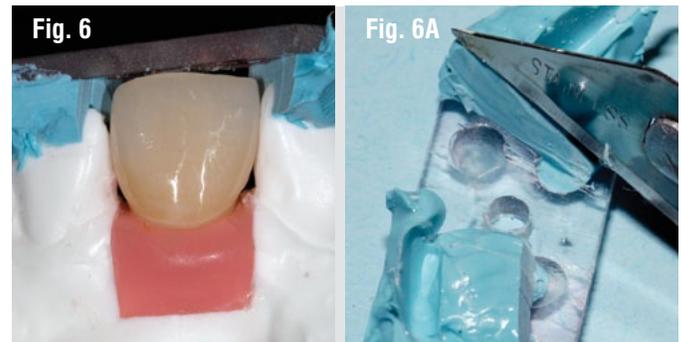


Fig. 6: Check the PILD seats when the crown is in place on the model. It should not rock. **Fig. 6A:** Cleaning the embrasures with a blade is usually necessary.

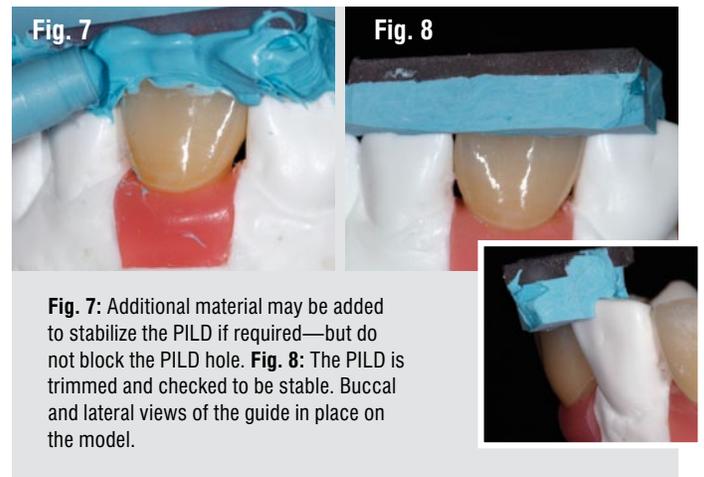


Fig. 7: Additional material may be added to stabilize the PILD if required—but do not block the PILD hole. **Fig. 8:** The PILD is trimmed and checked to be stable. Buccal and lateral views of the guide in place on the model.

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11. The device is made, and ready in case you ever need it!
(Fig. 8-10).

Keep the PILD with the patient's records. It can also be used to record data on it, such as which implant was used, the date, and laboratory (Fig. 10).

It can be given to the patient if they leave your office. Your laboratory can make these very easily for you. It provides a great service for our patients, and may save you a lot of time, effort and yes, money in the future.

Should the restoration need to be removed and the screw accessed, place the device onto the site, hold the drill at 90 degrees to the plate and go!

With Blu-Mousse there is the added advantage that should the indexing site change, for example the restoration next to the implant is altered, then simply remove the Blu-Mousse at that site, place the plate back on and add some new Blu-Mousse.

The PILD is currently being modified to enable it to be attached directly to commercial X-ray film holders. Because of its ability to record the long axis of the implant itself, and the plate lies 90 degrees to this, with an attached X-ray holder, radiographs more accurately record component fit and bone levels (Fig. 12). ■

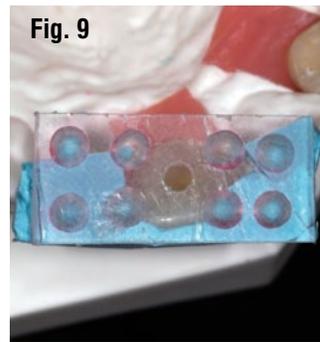


Fig. 9

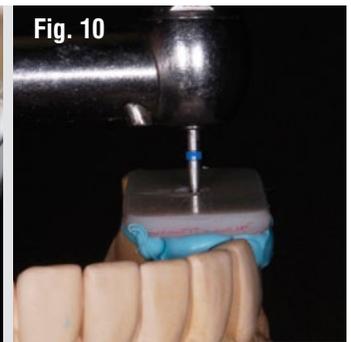


Fig. 10

Fig. 9: Occlusal view of PILD guide. Note trajectory of the screw is visible. Fig. 10: A bur placed in the PILD guide, and held at 90 degrees to the plate will give the site and direction of the underlying screw with minimal time and damage to the crown.



Fig. 11

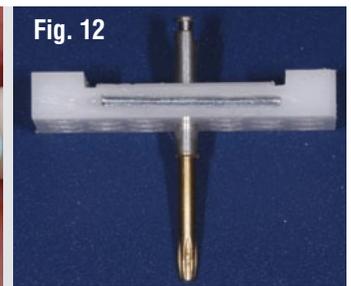


Fig. 12

Fig. 11: Information can be stored on the PILD, including implant type, date, laboratory where it was fabricated, etc. Fig. 12: The PILD has now been adapted so it can also be used to connect to commercially available X-ray film and sensor holders. Recent studies have shown this method gives significantly more accurate information about bone levels and component fit.

For further information see:

1. Simple device for locating the abutment screw position of a cement-retained implant restoration. Wadhvani C, Chung KH. *J Prosthet Dent.* 2013 Apr;109(4):272-4
2. A technique for predictable radiographs to evaluate prosthetic misfit and bone loss around Implants. Lin K, Wadhvani C, Sharma A, Finzen F. Accepted for publication *J Prosthet Dent.* 2013.
3. A novel implant-locating device for abutment retrieval and making predictable radiographs to evaluate prosthetic misfit and health of osseointegration. *Can J Rest Dent.* 2013 July;6(2):72-6

About the Author:



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Dr. Wadhvani practices in Bellevue, Washington as a Prosthodontist. He received his specialty certificate in prosthodontics as well as a Master's Degree from the University of Washington School of Dentistry. Dr. Wadhvani is an affiliate instructor in the Department of Restorative Dentistry at the University of Washington.

He is active in research related to implants and restorative dentistry and has been the primary author in many peer reviewed journals. Dr Wadhvani lectures nationally and internationally on implant restorations, occlusion, radiography and issues related to cement-related peri-implant disease.