

Reverse Margin™ Custom Abutments and Fixed Prosthetics

Increase Your Implant-Based Restoration Success Rates!

Dr. Frederick Li

As the use of implant-based restorations has increased around the world, so too have the complications arising from the implementation of that modality. One of the most difficult to avoid and treat has been peri-implantitis. The prevalence of peri-implantitis in dental treatment is startling, having been shown to be 10% of all implants placed and 18.8 to 20% of all implant patients in two studies (Mombelli¹ in 2012 and Atieh² in 2013). A full explanation of the causative factors of peri-implantitis has not been established as of yet³ but retained excess cement has been linked in several publications.^{4,5}

There have been a number of techniques and methodologies discussed aimed at reducing peri-implantitis caused by retained cement. These range from the type of cement used itself to the amount of cement utilized, margin placement, the design of abutment, and venting access. One relatively new, and very interesting, technique is the Reverse Margin™ design created by Emil Svoboda PhD, DDS which helps redirect the flow of cement upwards to allow easier cleaning. The shape of the margin built into a custom abutment and its complimentary prosthesis reduces or “prevents” the flow of excess cement into the subgingival environment for clinicians utilizing intra-oral cementation. The Reverse Margin™ custom abutment and prosthesis design actually redirects the flow of cement away from, rather than into, the tissues that surround dental implants. This has the potential to provide a variety of important benefits for the clinician in day-to-day practice of implantology:

- Controls the flow of excess cement.
- Optimizes the implant-abutment connection. Improves the passive fit of implant components due to intra-oral cementation.
- Reduces peri-implant disease and infection related to residual excess cement and open implant-abutment connections.
- “Prevents” the movement of excess into subgingival locations that are difficult to clean.
- Increases Success Rates. Minimize or eliminate some of the risk factors that are known to cause failure of dental implants and their attached teeth.
- Decreases Liability. It cannot be understated that any implant-based restoration failure is very expensive for all concerned – maintenance of ailing/failing implants, removal of failed implants and attached prosthetics, paperwork and legal fees.

“This has the potential to provide a variety of important benefits for the clinician in day-to-day practice of implantology”





Dr. Frederick Li

Dr. Frederick Li graduated from the University of Manitoba College of Dentistry. Desiring to further his dental education and experience, he moved to New York City and completed two years of dental residency in hospital facilities associated with Cornell Medical Center and Columbia University. Dental implantology was a focal component of the post-graduate training, enabling Dr. Li to gain surgical implant experience from some of the top implant surgeons and prosthodontists in the Greater New York Region.

Dr. Li is a graduate of the Misch Implant Institute, a Fellow of the International Congress of Oral Implantologists and Associate Fellow of the American Academy of Implant Dentistry. A general practitioner in private practice in Vancouver with a large volume of surgical and prosthetic dental implants, Dr. Li lectures across Canada. He conducts a variety of training programs on oral implantology and dental implant placement while also mentoring a large implant study club in the Vancouver area.

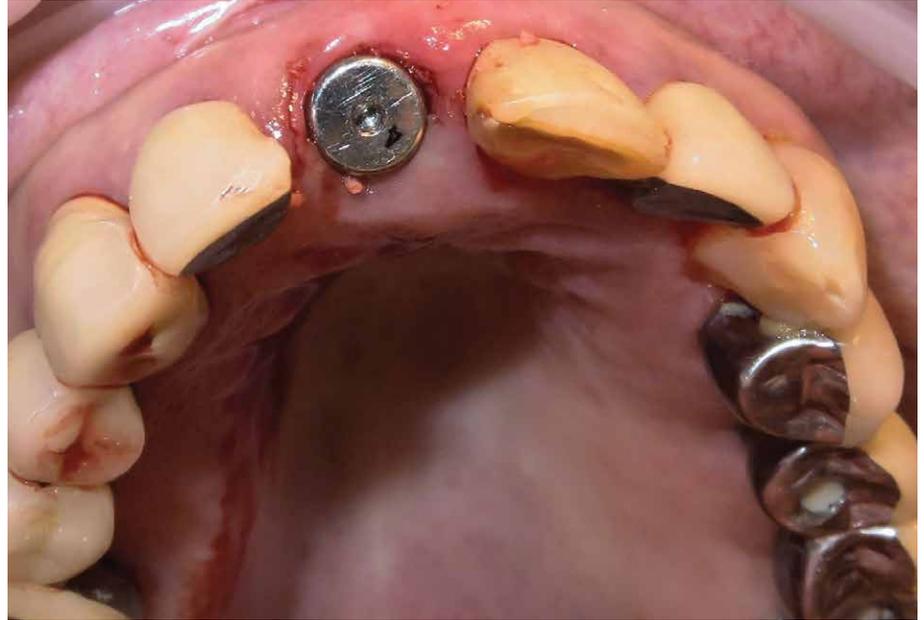
Case Study

This case study illustrates how easily the Reverse Margin approach can help you avoid retained cement around your implant restorations.

The female patient had been eating spare ribs and, when biting down, fractured tooth 1-1 right at the gum line. On considering her alternatives to replace the now missing tooth, she decided on an implant-based restoration as the most conservative approach. In addition, she decided against immediate loading of the implant to reduce cost. With a low smileline, matching gingival levels is not crucial.

The remaining tooth was extracted and an AVINENT Ocean implant (size 3.5 x 13) was placed. This particular implant was chosen due to its excellent stability in the socket. At this point, we, as clinicians, face another choice. A screw-retained prosthesis is the obvious answer to avoid cement completely but this is not always possible. In this case, bone anatomy prevented placement of the implant in the correct position to hide the access hole. As can be seen in Figure 1, the access hole was closer to the buccal making it all but impossible to hide the retaining screw. With a cement-retained crown now indicated, it was time to consider the design of the restoration. In restoring the anterior, we need to place the margin lower than we would in the posterior to avoid having any underlying gray show through the restoration. This case was a perfect application for a Reverse Margin abutment and crown.

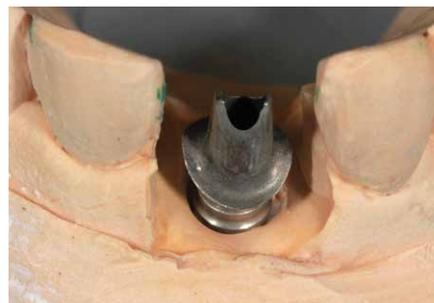
An AVINENT closed tray impression post was placed on the implant (Figures 2A and 2B) and a closed tray impression taken. The Reverse Margin is a simple design and should be placed subgingivally in the esthetic zone and equal or supra gingival in the non-esthetic regions. In this case, I requested that Aurum Ceramic/Classic fabricate an abutment with 1 mm subgingivally on the buccal and equal gingival on the remaining margin (Figure 3). The resulting abutment fit perfectly on try-in. Aurum Ceramic/Classic creates an invaluable jig (Figure 4) that allows easy, precise and accurate placement of the



▲ Figure 1 - Implant in place. Note the access hole is slightly to the buccal.



▲ Figures 2A and 2B – Impression post for AVINENT Ocean implant in place, ready for closed tray impression.



▲ Figure 3 – Reverse Margin abutment on the model. Note the shape of the margin itself.



▲ Figure 4 – Laboratory-fabricated jig used to place the abutment with extreme accuracy.

“ This case study illustrates how easily the Reverse Margin approach can help you avoid retained cement around your implant restorations. ”



abutment every time. You simply place the abutment in the jig and place the “assembly” in the mouth. The jig is easily removed and the abutment is perfectly positioned on the implant (Figure 5). Figure 6 shows the subgingival placement of the abutment margin on the buccal intraorally. Aurum Ceramic/Classic also created a Zirconia Crown with labial cutback. We all know how difficult it can be to match the shade and staining of a single anterior restoration to the remaining dentition. The Advanced Esthetic team at Aurum Ceramic/Classic did a superb job!

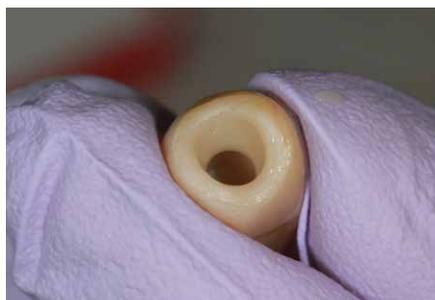


▲ Figure 5 – Abutment in place intraorally.



▲ Figure 6 – Note the placement of the margin in relation to the gingiva.

While the Reverse Margin approach assists in handling excess cement, it is still important to carefully apply the cement inside the crown, taking care to avoid using too much material at the outset (Figure 7). As you can see on Figure 8, the Reverse Margin abutment and crown have directed the excess cement away from the subgingival region on insertion (i.e., supragingivally) allowing for easy clean-up. This helps to avoid long-term problems and increases the long-term positive prognosis for the implant-based restorative solution. The final result: a natural smile restored in keeping with the patient’s remaining dentition (Figure 9).



▲ Figure 7 – Cement is carefully applied inside the crown.



▲ Figure 8 – Crown inserted. Note natural shade match and easy clean-up of cement.

Bibliography

- ¹ Mombelli A, Müller N, Cionca N., *Clin Oral Implants Res.* 2012 Oct;23 Suppl 6:67-76. doi: 10.1111/j.1600-0501.2012.02541.x. Review. PMID: 23050501
- ² *J Periodontol.* 2013 Nov; 84(11):1586-98. doi: 10.1902/jop.2012.120592. Epub 2012 Dec 13. The frequency of peri-implant diseases: a systematic review and meta-analysis. Atieh MA1, Alsabeeha NH, Faggion CM Jr, Duncan WJ.
- ³ *J Periodontol.* 2016 Mar; 87(3):212-20. doi: 10.1902/jop.2015.150450. Epub 2015 Nov 5. Investigation of the Association Between Cement Retention and Prevalent Peri-Implant Diseases: A Cross-Sectional Study. Kotsakis GA1, Zhang L2, Gaillard P3, Raedel M4, Walter MH4, Konstantinidis IK4.
- ⁴ *Clin Oral Implants Res.* 2013 Nov; 24(11):1179-84. doi: 10.1111/j.1600-0501.2012.02570.x. Epub 2012 Aug 8. Does residual cement around implant-supported restorations cause peri-implant disease? A retrospective case analysis. Linkevicius T1, Puisys A, Vindasiute E, Linkeviciene L, Apse P.
- ⁵ *Clin Implant Dent Relat Res.* 2015 Oct; 17 Suppl 2:e434-43. doi: 10.1111/cid.12265. Epub 2014 Sep 2. Peri-Implantitis Associated with Type of Cement: A Retrospective Analysis of Different Types of Cement and Their Clinical Correlation to the Peri-Implant Tissue. Korsch M1, Walther W1.



▲ Figure 9 – Final restored smile with new crown in position.