



# Safer Implant Treatment: Mitigating the Root Causes of Complications Related to Current Prostheses Installation Techniques

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Knowledge is forever advancing. In my early days when my computer froze, I used to think “What did I do wrong now.” Today I think “What is wrong with this computer!” No, it’s not always me that is to blame for problems. Many systems that we have come to use daily, are simply flawed.

I have placed and restored thousands of dental implants over 25 years. I love what implants allow me to accomplish for my patients. What keeps me up at night is “How to deal with treatment complications”. When patients spend their hard-earned money on new teeth, they really don’t like buying complications. They already have enough problems and so do we.

Perhaps we can agree that much of peri-implant disease involves oral pathogens. So, to improve our treatment results, it is logical to view our work microscopically. Things look a lot different in that dimension. 8000 microbes can sit on the cross-section of a single human hair. If we could stuff them into that hair, like a stuffing a sausage, and wrap it around a molar, it could accommodate a billion bacteria. A billion pathogens can present quite the challenge to our body defense systems!

Four recent large reviews indicate a peri-implant mucositis rate of 30% and a peri-implantitis rate of 15%. This gives an overall peri-implant disease rate of 45%, and a 5 and 10 year failure rate of 4 and 8% respectively. **(1,2,3,4)** The reviews found **NO DIFFERENCE** in the rates of peri-implant disease between those cases where the prosthetics were installed by the cement-in or the screw-in technique. Treatment of complications can be costly.

Recently, our Governing Body, was compelled to send an article **(5)** to all dentists in Ontario. This article presented a frightening Peri-implant Disease rate of 65% for their Swedish patients. The research group recommended that Dentists should inform their patients about this 65% Disease Rate, as part of their informed consent. Not exactly Great for Business!

**It should interest you that I have identified 2 root causes of complications directly related to prosthesis installation.**

The first root cause is something we may all be familiar with, because the literature is full of it. It is **Prosthesis Dimensional Error**. It results from the culmination of all the errors involved in making the prosthesis. That is why we have our handpieces and articulating paper on our bracket tables on installation day, why we have good days and bad days, and why post-installation x-rays can be rather exciting!

For screwed-in prosthetics, Prosthesis Dimensional Error can cause open and tight contacts, hyperocclusion and that dreaded implant-abutment misfit at the deep tissue level. A recent review found this misfit to range from 95 to 232 micrometers. **(6)** Billions of pathogens can live around such misfits.

For cemented prosthetics, Prosthesis Dimensional Error can cause open and tight contacts, hyperocclusion, open margins, overhanging margins, overextended margins, and the dreaded problem of residual subgingival cement. There is room for billions of pathogens under those ill-fitting margins and on that subgingival cement!

**My solution to Prosthesis Dimensional Error, starts with an intra-oral cementation step that has sufficient cement space to compensate for dimensional error.**

You may not be aware that your dental laboratories and their milling companies already use increased cement space at their margins to help dentists seat their prosthetics. This is their “secret sauce” to keep you happy and to reduce post production costs. This additional cement space may vary from 25 microns, claimed by some milling companies to ½ mm recently claimed by a lab technician whose dentist demands a ½ mm or 500 micron clearance around the entire margin. I can only say WOW.

Unfortunately, it is not possible to safely increase cement space with tissue facing margins because that also increases overhangs, overextended margins, residual subgingival cement and their related complications. This huge problem has eluded dentists for over 100 years.

However, the increased cement space solution can be used with a Reverse Margin™ design on the custom abutment without causing the abovementioned problems. This margin design contains the prosthesis margins and prevents the gingival from interacting with them. Using this margin design alone can be a huge step toward creating a better Standard of Care for our patients. As well, this concept can be used to safely prevent dreaded implant-abutment misfit that is endemic to the screw-in prosthesis installation technique. **(7)**

**The second root problem can result from the Gingival Effects.** This term describes the interaction of the gingiva with the base of the prosthesis during the process of intra-oral cementation. They can exacerbate the problem of subgingival cement as well as cause open margins and hyperocclusion. I have found that the Gingival Effects can be mitigated by intelligent abutment and prosthesis design that also includes the abovementioned Reverse Margin™. **(8)**

So, we, the dentists, have a choice to make. Do we want to continue debating about which of our flawed installation systems is better, or do we want to fix their underlying root causes and spend less time dealing with complications? I estimate that mitigating the root causes of installation related complications can reduce peri-implant disease by 60%. **(9,10)** Thus, hundreds of thousands of patients and their dentists can be saved from needing to deal with preventable treatment complications, in Canada and the USA. **Isn't it time for us to evolve our prostheses installation systems, to make implant treatment better than ever the Svoboda Way?**

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