

Effectiveness of Implant Therapy Analyzed in a Swedish Population: Prevalence of Peri-implantitis

EDITORIAL by Dr. Emil L.A. Svoboda PhD, DDS,
Published to www.ReverseMargin.com
Aug 8, 2016



This editorial argues the relevancy of the “Prevalence of Peri-implantitis”, data derived from the article “Effectiveness of Implant Therapy Analyzed in a Swedish Population: Prevalence of Peri-implantitis” by J Derks et. al. (JDR January 1, 2016 95: 43-49). A copy of the aforementioned article was sent to all dentists in Ontario, Canada by the Royal College of Dental Surgeons of Ontario (RCDSO). I have reservations regarding the potential interpretation of the results from this article.

1. J Derks et al. acknowledges the large variation in the literature regarding the criteria used to diagnose mucositis and peri-implantitis. Their selection of criteria used for the diagnosis of peri-implant disease may mislead the reader to a biased conclusion of an **exaggerated prevalence of peri-implant disease.**
2. Considering the post-treatment care received by the 9 year group of implant patients studied, I suggest the results of their study describe what can happen to a group of high risk patients when they receive **inappropriate professional care after extensive implant treatment.**

Exaggerated Prevalence of Peri-implant Disease

The criteria used to diagnose peri-implant disease has varied in previous publications, this particular variation is not absolute. The diagnostic tests used to diagnose gingivitis and periodontitis around natural teeth were applied to dental implants, although the indicators of pathology may not be equal for both. The gingival tissues do not connect to dental implants in the same way as they do to natural teeth. Dental implants are frequently surrounded by cuffs of soft tissue, covered with a fragile thin layer of epithelium adjacent to the dental implant.

Probing of this epithelium can easily make it bleed. This bleeding may not be a sign of pathology, but a sign of injury.

In this study the bleeding on probing was grouped together with suppuration, with no mention of swelling or redness of tissues. What part was injury and what part was pathology? It is difficult to tell from the results. Certainly, suppuration could be a much more convincing indicator for peri-implant disease than bleeding on probing alone. Unfortunately, the grouping of bleeding on probing together with suppuration increases the numbers involved in their diagnoses of mucositis and peri-implantitis, and thus exaggerates its prevalence of peri-implant disease.

In the article reviewed, the authors use the measure of bone loss to determine peri-implantitis, and as an indicator of the severity of the disease. Does bone loss of 1-2 mm signify disease or is a function of homeostasis after treatment? In the absence of redness of tissue, tissue enlargement, and exudate, is it still pathology? In earlier studies of osseointegration, an initial bone loss of 1 mm and a continued loss of 0.1 mm per year was expected. So after 9 years, is 2 mm of bone loss pathology?

With natural teeth, gingival recession and loss of facial bone can result in a very stable condition that can last a lifetime. Similarly, implants with 2 mm of bone loss can be stable for many years with appropriate care. Undeniably, moving the inclusion criteria from 2 to 3 mm of lost bone has a huge negative effect on the prevalence of disease. It would be helpful if other signs of active pathology were presented, to give readers a more objective view of the condition of the test group. Here again, this study exaggerates the prevalence of peri-implant disease.

Contact Dr. Emil Svoboda PhD, DDS
110 Queen St East
Brampton, ON L6V 1B1, Canada

905-866-6657,
Fax 905-866-6244
drsvoboda@reversemargin.com

This study reports peri-implant disease at the patient level. The patients in the sample group had an average number of dental implants that was almost double of my patient base. This increased number of implants per patient increases the frequency of patients with peri-implant disease alone. I would suggest that if we study the prevalence of periodontitis in the natural dentition on the patient level, the prevalence would be very high. In fact, it is common for healthy patients, **with no signs of inflammation**, to have a 5 mm pocket around one on their teeth. That would translate into an almost 100% periodontitis rate on the patient level. These statistics are not only highly disconcerting, but hardly useful.

When we compare the incidence of periodontitis with the incidence of peri-implant disease on a patient level, perhaps the peri-implant disease levels might look more encouraging. I am satisfied that the investigators also tabulated the result at the implant level. This gives a better indication of the prevalence of peri-implant disease. Considering the diagnosis issues mentioned above and the aftercare issue that is discussed below, treatment with dental implants is developing into a much safer process.

Inappropriate Professional Care

The above article reports that 80% of the patient group studied had **regular recalls on an annual basis** and that about 20% had irregular care or missing data. Also, there are no details about what was done at the recall visits over the 9 years of the study. The average number of implants per patient was approximately 4, 20% of the patients were smokers, and 24% were diagnosed with periodontitis on remaining teeth.

With many failed teeth, multiple implants, a large percentage of smokers (20%), and a large percentage of periodontitis (24%), this group of patients should be considered to have a high risk for developing peri-im-

plant disease. In this high risk group of patients, with treatment worth thousands of dollars, I would say that an annual recall frequency or less, is both an insufficient and imprudent post-treatment recall protocol. Do you agree? In my professional opinion, **the periodontitis group (24%) alone** would benefit from a 3 month recall protocol to help stabilize their condition.

About 18% of the patients studied had their prosthetics cemented intra-orally. If this group of patients displayed signs of mucositis, according to the study by Wilson (2009)¹, at least 74% of these mucositis cases could have been normalized by removal of residual subgingival cement. There is no indication if anyone attempted to prevent the progress of mucositis to peri-implantitis by the removal of residual subgingival cement. A more comprehensive post-treatment protocol might have diagnosed the problem and initiated effective treatment. Removal of the residual subgingival cement would have reduced the reported mucositis and peri-implantitis rates.

The rest of the peri-implant disease cases were attributed to patients who had their prosthetics installed by the screw-in technique (82% of cases). It may be difficult to reduce peri-implant disease that results from a misfit at the implant-abutment junction. How do you fix that? Perhaps through surgery and frequent scaling the clinician could have changed the peri-implant environment. Perhaps this process could have resulted in making the implant-abutment connection "less-subgingival", and thus aided the patient's ability to maintain and tolerate the implant-abutment misfit better. It may be better to try to understand and prevent this "misfit problem" in the first place.

Considering the misfit of the implant-abutment connection is a problem inherent to the screw-in installation technique.

Further Discussion

After 34 years practicing wet-fingered dentistry, I have spent the last 4 years focusing on the iatrogenic causes of peri-implant disease. The information presented, promises to help the clinician mitigate some of the problems related to current prosthesis installation techniques. Now, more than ever, our industry must be actively using preventative measures to reduce the incidence of peri-implant disease. The current prosthesis installation techniques are not working as well as we all had wished.

My work suggests that we can now optimize the fit of the implant-abutment connection and prevent residual subgingival cement. This alone promises to reduce iatrogenic complications by 60%, as extrapolated from the results of Wilson 2009.¹

It is clear that the installation of the abutment onto its retaining implant, prior to attaching the prosthesis, is necessary for optimizing the implant-abutment connection. This process is already inherent to the cement-in prosthesis installation technique. However, now we can also accomplish this feat through the "Svoboda Modification" of the current screw-in prosthesis installation technique. This promises to prevent iatrogenic complications related to the implant-abutment misfit, which is inherent to the current screw-in installation technique.

Our patients deserve safer treatment and I'm concerned that the dental implant industry will suffer if our patients begin to reject this excellent treatment modality. We need to implement the suggested changes as soon as possible to help reduce peri-implant disease and to maintain the trust from the patients we service.

Peri-implant disease can be very costly to treat, but the iatrogenic component is now

preventable by a few changes in abutment-prosthesis design and installation process. First, it is necessary to install abutments onto their retaining implants prior to attaching the prosthesis. This process prevents the iatrogenic component of the implant-abutment misfit. Therefore optimizing the mechanical fit and stability of this subgingival joint, and reducing the biological consequences related to its misfit.

Second, it is necessary to fit, adjust, and cement the prosthesis into place over the abutments. Using an intra-oral cementation technique to control the flow and location of excess cement, for easier detection and removal, is key.

I have found through my own extensive research a more effective process, and design to prevent the incidence of both residual subgingival cement, and cement voids under the prosthesis. The results of my study on safer cementation techniques can be found here (We can hyperlink it to the "Safer Cementation..." article, or hyperlink it to any page you choose from Reverse Margin).

In addition to a safer installation technique, that both prevents the implant-abutment misfit and controls excess cement, I customize my "after implant-treatment care program" to suit the individual needs of the patient. I usually recommend a recall frequency of 3 months to optimize home care, and to detect and treat the early manifestation of the peri-implant disease process. This recall frequency has a much better chance of protecting the patient's investment in their oral health. I might vary this after-treatment-care program to accommodate specific patient risk factors, but I would apply this protocol to all of the 4 or more implant treatment cases reported in this study. A less frequent recall protocol would be, in my professional opinion, inappropriate. An ounce of prevention is worth a pound of cure.

Summary:

With regard to the J Derks et al. article, the prevalence of peri-implantitis is seemingly exaggerated and the inclusion information could be better defined.

The study clearly shows that annual recalls and intermittent recalls are not consistent with optimal oral health maintenance around dental implants.

The professionals delivering implant based treatment should implement techniques to prevent the known iatrogenic contributors to peri-implant disease. It may also be prudent to implement post treatment protocols that are effective in early detection and treatment of peri-implant disease. This is more likely to help their patients prevent complications of treatment and maintain optimal oral health.

References

1. The positive relationship between excess cement and peri-implant disease: a prospective clinical endoscopic study. Wilson,T.G., J Periodontol 2009;80:1388.
2. An Intra-oral Cement Control System. A Great Solution to a Big Problem. Svoboda E.L.A., Presented July 16, 2016 at AGD Boston "Revolutionary Changes in Dentistry", www.ReverseMargin.com.