EC Dental Science Editor's Column - 2016

Peri-Implantitis: Etiology and Management

"Simple biofilm disruptive periodontal therapies to treat peri-implantitis may not be an adequate solution and it is not only critical to decrease the microbiological load but more importantly, to achieve host immune modulation"

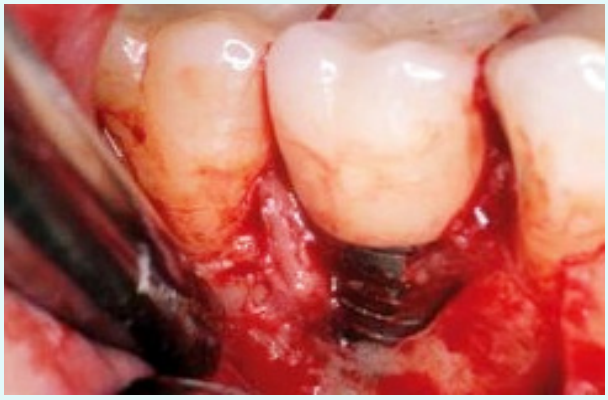
Zeeshan Sheikh
University of Toronto
Canada

Zeeshan Sheikh[1]*, Abdullah M Alshahrani[2] and Kawusigan Thaventhirarajah[3]

[1]Faculty of Dentistry, University of Toronto, Canada
[2]Alfarabi Dental College, Riyadh, KSA
[3]Faculty of Arts and Science, University of Toronto, Canada

COLUMN ARTICLE

Dental implants are commonly used for the replacement of lost teeth with more than two million dental implants annually being placed worldwide [1]. While success rates of dental implants are quite high, around 5-12% of dental implants continue to fail [2,3]. Dental implant failures are known to be due to biomechanical and/or biological imbalances [4-8]. For instance, functional loads that exceed the implant-bone interface due to overloading conditions often lead to biomechanical failures [4,9]. Whereas, biological failures are mostly associated with microbial plaque accumulation and bacterial infections [10,11]. Early biological failures are associated with dental implant infection due to contaminated surgical placement or impairments in host healing response [2,12]. Late dental implant infections usually occur more than one year after placement and are termed as plaque induced peri-implant disease [13,14]. Peri-implant disease is the general term used to describe host tissue inflammatory reactions around dental implant sand is of two types: (i) Peri-implant mucositis, which is defined as a reversible inflammatory reaction in soft tissues surrounding the dental implant [15]; (ii) Inflammatory process affecting the tissues (soft and hard) surrounding an osseointegrated implant resulting in rapid loss of supporting bone and is commonly associated with bleeding and suppuration [1]. Peri-implantitis is usually the consequence of a disturbance in the equilibrium between the micro-flora and the defense system [16]. Once the peri-implant disease starts, it is very difficult to switch the inflammatory response off mediated by the immune system, which often leads to continued destruction of supporting tissues around dental implants. Data from clinical investigations with up to 5 years' follow-up show that the incidence of implants exhibiting peri-mucositis is around 28% whereas peri-implantitis is around 14% [17-19].



Diagnosis of peri-implantitis relies on an assessment of the status of periodontal tissues around the dental implant [20-23]. Signs of peri-implant disease include bleeding or suppuration after probing, soft tissue swelling,

Citation: Zeeshan Sheikh., et al. "Peri-Implantitis: Etiology and Management". EC Dental Science ECO.01 (2016): 12-14.

peri-implant pockets greater than 4 mm, crestal bone loss or saucer-shaped radiolucency around the implant, mobility, and pain [24]. There are several approaches that have been employed to try arrest and/or treat peri-implantitis, usually without predictable clinical success [25-28]. The first line of treatment is usually non-surgical debridement (scaling and root planning), which is commonly combined with irrigation using chlorhexidine [27,29]. The purpose of non-surgical debridement is to reduce inflammation by mechanically disrupting the biofilm on the implant surface [30]. It has also become standard practice to locally administer antibiotics to patients with moderate to severe disease progression [31].

Simple biofilm disruptive periodontal therapies to treat peri-implantitis may not be an adequate solution. When scaling, implant surface debridement and local anti-microbial therapies often fail to halt progression of peri-implantitis, surgical debridement is a commonly used. This mainly involves the resection of affected tissues, debridement, and implant surface decontamination, followed by bone grafting, with or without the use of barrier membranes [29]. It has become increasingly apparent that the traditional treatment modalities to manage peri-implantitis do not provide predictable clinical results [32,33]. This is due to the fact that it is almost impossible to thoroughly clean the implant surfaces and completely eliminate all infectious and toxin producing microbial populations which reside in an active peri-implant disease site [33,34]. Hence, it is not only critical to decrease the microbiological infectious agents but more importantly, to achieve host immune modulation. This approach in combination with antimicrobial therapy can be expected to provide much more predictable and clinically efficacious results in patients presenting with peri-implantitis.

BIBLIOGRAPHY

1. Klinge B., *et al.* "Peri-implantitis". *Dental Clinics of North America*49.3 (2005): 661-676.

2. Snauwaert K., *et al.* "Time dependent failure rate and marginal bone loss of implant supported prostheses: a 15-year follow-up study". *Clinical oral investigations*4.1 (2000): 13-20.

3. Berglundh T., *et al.* "A systematic review of the incidence of biological and technical complications in implant dentistry reported in prospective longitudinal studies of at least 5 years". *Journal of clinical periodontology*29.S3 (2002): 197-212.

4. Quirynen M., *et al.*"Dynamics of initial subgingival colonization of 'pristine'peri-implant pockets". *Clinical oral implants research*17.1 (2006): 25-37.

5. Quirynen M., *et al.* "Infectious risks for oral implants: a review of the literature". *Clinical oral implants research*13.1 (2002): 1-19.

6. Romeo E., *et al.* "Peri-implant diseases. A systematic review of the literature". *Minerva stomatologica*53.5 (2004): 215-230.

7. Tonetti MS., *et al.* "Determination of the success and failure of root-form osseointegrated dental implants". *Advances in dental research*13.1 (1999): 173-180.

8. Piattelli A., *et al.*"Microscopical features in retrieved human Branemark implants: A report of 19 cases". *Biomaterials*19.7 (1998): 643-649.

9. Quirynen M., *et al.*"The intra-oral translocation of periodontopathogens jeopardises the outcome of periodontal therapy". *Journal of Clinical Periodontology*28.6 (2001): 499-507.

10. Esposito M., *et al.*"Differential diagnosis and treatment strategies for biologic complications and failing oral implants: a review of the literature". *International Journal of Oral and Maxillofacial Implants*14.4 (1999): 473-490.

11. Teughels W., *et al.*"Effect of material characteristics and/or surface topography on biofilm development". *Clinical oral implants research*17.S2 (2006): 68-81.

12. Esposito M., *et al.*"Biological factors contributing to failures of osseointegrated oral implants,(II). Etiopathogenesis". *European journal of oral sciences*106.3 (1998): 721-764.

13. Quirynen M and W Teughels."Microbiologically compromised patients and impact on oral implants". *Periodontology 2000*33.1 (2003): 119-128.

14. Tonetti MS. "Risk factors for osseodisintegration". *Periodontology 2000*17.1 (1998): 55-62.

15. Misch CE. "Contemporary Implant Dentistry". *Implant Dentistry*8.1 (1999): 90.

16. Rokn AR., *et al.* "An Unusual bone loss around implants". *Journal of Dentistry (Tehran, Iran)*10.4 (2013): 388.

17. Costerton J., *et al.* "Biofilm in implant infections: its production and regulation". *The International journal of artificial organs*28.11 (2005): 1062-1068.

18. Ferreira S., *et al.* "Prevalence and risk variables for peri-implant disease in Brazilian subjects". *Journal of Clinical Periodontology*33.12 (2006): 929-935.

19. Newman MG., *et al.* "Carranza's clinical periodontology". Elsevier health sciences (2011).

20. Wingrove SS., *et al.* "Peri-implant therapy for the dental hygienist: clinical guide to maintenance and disease complications". John Wiley & Sons (2013).

21. Misch CE. Contemporary implant dentistry. Elsevier Health Sciences (2007).

22. Mombelli A and NP Lang. "The diagnosis and treatment of peri-implantitis". *Periodontology 2000*17.1 (1998): 63-76.

23. Mombelli A. "Etiology, diagnosis, and treatment considerations in peri-implantitis". *Current opinion in Periodontology*4 (1996): 127-136.

24. Jepsen S., *et al.* "Primary prevention of peri-implantitis: Managing peri-implant mucositis". *Journal of clinical periodontology*42.S16 (2015): S152-S157.

25. Roos-Jansåker AM., *et al.* "Treatment of peri-implant infections: a literature review". *Journal of clinical periodontology*30.6 (2003): 467-485.

26. Lang NP., *et al.* "Clinical Trials on Therapies for Peri-Implant Infections". *Annals of Periodontology*2.1 (1997): 343-356.

27. Renvert S and IN Polyzois. "Clinical approaches to treat peri-implant mucositis and peri-implantitis". *Periodontology 2000*68.1 (2015): 369-404.

28. Lang NP and J Lindhe. "Clinical periodontology and implant dentistry". John Wiley & Sons (2015).

29. Norowski PA and JD Bumgardner. "Biomaterial and antibiotic strategies for peri-implantitis: A review". *Journal of Biomedical Materials Research Part B: Applied Biomaterials*88.2 (2009): 530-543.

30. Pihlstrom BL., *et al.* "Periodontal diseases". *The Lancet*366.9499 (2005): 1809-1820.

31. Schenk G., *et al.* "Controlled local delivery of tetracycline HCl in the treatment of peri-implant mucosal hyperplasia and mucositis. A controlled case series". *Clinical oral implants research*8.5 (1997): 427-433.

32. Meffert R. "Periodontitis vs. peri-implantitis: the same disease? The same treatment?"*Critical Reviews in Oral Biology & Medicine*7.3 (1996): 278-291.

33. Lindhe J and J Meyle. "Peri-implant diseases: Consensus Report of the Sixth European Workshop on Periodontology". *Journal of clinical periodontology*35.S8 (2008): 282-285.

34. Mouhyi J., *et al.* "The Peri-Implantitis: Implant Surfaces, Microstructure, and Physicochemical Aspects". *Clinical implant dentistry and related research*14.2 (2012): 170-183.