Management of peri-implant diseases: A commentary

Ioannis Kormas*, Alessandro Pedercini, Larry F. Wolff

Department of Developmental and Surgical Sciences, University of Minnesota, Minneapolis, United States

Abstract

This manuscript is a commentary on the recent publication "Peri-implant Diseases: Diagnosis, Clinical, Histological, Microbiological Characteristics and Treatment Strategies. A Narrative reviews". The paper addresses the gaps in the literature on the subject of peri-implant diseases. Currently, the vast majority of epidemiological studies are using a heterogenous definition for peri-implant diseases; it is important to use the case definitions of the 2017 World Workshop on the Classification of Periodontal and Peri-implant Diseases and Conditions. Existing implant prognostication systems are based on studies with weak-evidence; more prospective studies with longer follow-up are required for the development of a reliable system. Finally, there is no universal agreement on the treatment of peri-implantitis; further research is warranted to propose an evidence-based treatment protocol.

Keywords: Peri-implantitis, Peri-implant mucositis, Peri-implant disease, Diagnosis, Treatment.

Accepted: *20th January, 2021*

Introduction

The use of dental implants is on the rise and so is the prevalence of peri-implant diseases. Recently, at the 2017 World Workshop on the Classification of Periodontal and Peri-implant Diseases and Conditions, the case definitions of peri-implant health, peri-implant mucositis and peri-implantitis were described [1,2]. Peri-implant health is characterized by the absence of: signs of inflammation and bleeding on probing (BOP), increased probing depth (PD) and radiographic bone loss (RBL). Peri-implant mucositis is defined by the presence of visual signs of inflammation/BOP, but also the absence of increased PD and RBL. Peri-implantitis is diagnosed based on the presence of: signs of inflammation/BOP with increased PD and RBL beyond an initial bone remodeling of 2 mm.

While a consensus has just been reached on how to diagnose peri-implant diseases, there is still lack of consistency in related epidemiological studies as well as scarce evidence on the prognosis and treatments of such conditions. The aim of this paper is to discuss the evidence of current protocols used in the treatment of peri-implant diseases.

Materials and Methods

This manuscript is a commentary on a recent comprehensive review which discusses the subject of peri-implant diseases with emphasis on treatment strategies [3]. The paper raises concerns about the missing knowledge in the literature on the subject, focusing on the epidemiology of peri-implant diseases, implant prognostication systems and recommended treatment strategies.

Observations

Epidemiology

Epidemiological studies have been conducted on peri-implant mucositis and peri-implantitis reporting wide ranges on the prevalence of these conditions (19%-65% for peri-implant mucositis; 1%-85% for peri-implantitis) [4-7]. The wide range is indicative of heterogenous data and published literature inconsistencies.

Prognostication systems

There is lack of evidence for the development of a valid and reliable implant prognostication system. Current systems are based on surveys or short-term retrospective studies [8,9]. There are no longitudinal prospective studies or randomized controlled clinical trials for implant prognosis.

Treatment of peri-implant diseases

Non-surgical treatment is sufficient for peri-implant mucositis [10]. However, the treatment of peri-implantitis routinely requires a surgical approach due to possible recurrence or non-resolution of the peri-implant disease [11-14]. The main objectives of the treatment of peri-implantitis are the resolution of the inflammation via decontamination of the implant surface and the regeneration

of the peri-implant infra-bony defect when feasible [15].

The surgical treatment of peri-implantitis comprises open-flap debridement, apically positioned flap (with or without implantoplasty) and guided bone regeneration of the peri-implant defect [16-18]. However, according to the current literature, there is no technique that is considered superior from others or any protocol that is predictable for the treatment of peri-implantitis, based on prospective cohort studies. The collective success rates reported in the literature for the surgical treatment of peri-implantitis range from 14.3% to 83% [19-24].

Discussion

Epidemiologically, great heterogeneity is present in the prevalence of peri-implant mucositis and peri-implantitis. The etiology of this significant variability in the reported results is primarily the inconsistent criteria used by these published studies in the case definitions. While this is a valid concern with the updated case definitions from the 2017 World Workshop on the Classification of Periodontal and Peri-implant Diseases and Conditions, the problem of the heterogeneity should be resolved [1,2]. Case definitions of peri-implant mucositis and peri-implantitis should be utilized consistently across clinical investigations in order to obtain meaningful results from future cross-sectional epidemiological studies [25].

It has been proven that peri-implantitis bone loss progression follows a non-linear pattern which increases over time, making the development of an implant prognostication system challenging [26,27]. In addition, the current systems are not supported by longitudinal prospective data. It is the opinion of the authors that research should be focusing on the development of a prognostication system resulting from prospective cohorts or randomized clinical trials.

There is agreement that peri-implant mucositis should be treated non-surgically, while peri-implantitis requires a surgical approach. However, there remains a great deal of ambiguity in the treatment protocols for peri-implantitis. There is no consensus reached on which instruments should be used for the implant surface decontamination as well as the effectiveness of adjunctive antibiotics or chemical surface treatment of implants for peri-implantitis thereof [28,29]. As far as the surgical techniques in the treatment of peri-implantitis, there are not well-established protocols with predictable outcomes. More randomized controlled trials are required to indicate an evidence-based approach for the treatment of peri-implant diseases.

Acknowledgements

The current manuscript is a commentary on the published paper “Peri-implant Diseases: Diagnosis, Clinical, Histological, Microbiological Characteristics and Treatment Strategies. A Narrative Review.” written by the same authors. The preparation of this report was in part supported by a University of Minnesota Division of Periodontology Grant (Wolff, L.). The authors report no conflict of interest.

References

1. Berglundh T, Armitage G, Araujo MG, et al. Peri-implant diseases and conditions: Consensus report of workgroup 4 of the 2017 World Workshop on the Classification of Periodontal and Peri-Implant Diseases and Conditions. J Periodontol. 2018; 89:S313-8.
2. Renvert S, Persson GR, Pirih FQ, et al. Peri-implant health, peri-implant mucositis, and peri-implantitis: Case definitions and diagnostic considerations. J Clin Periodontol. 2018; 45:S278-85.
3. Kormas I, Pedercini C, Pedercini A, et al. Peri-Implant Diseases: Diagnosis, clinical, histological, microbiological characteristics and treatment strategies. A Narrative Review. Antibiotics. 2020; 9(11):835.
4. Derks J, Tomasi C. Peri-implant health and disease. A systematic review of current epidemiology. J Clin Periodontol. 2015; 42:S158-71.
5. Lee CT, Huang YW, Zhu L, et al. Prevalences of peri-implantitis and peri-implant mucositis: systematic review and meta-analysis. J Dent. 2017; 62:1-2.
6. Rakic M, Galindo-Moreno P, Monje A, et al. How frequent does peri-implantitis occur? A systematic review and meta-analysis. Clin Oral Investig. 2018; 22(4):1805-16.
7. Dreyer H, Grischke J, Tiede C, et al. Epidemiology and risk factors of peri-implantitis: A systematic review. J Periodont Res. 2018; 53(5):657-81.
8. Najafi B, Kheirieh P, Torabi A, et al. A new prognostication system for dental implants. Int J Periodont Restorative Denti. 2018; 38(1).
9. de Araújo Nobre M, Salvado F, Nogueira P, et al. A prognostic model for the outcome of nobel biocare dental implants with peri-implant disease after one year. J Clin Med. 2019; 8(9):1352.
10. Renvert S, Roos-Jansåker AM, Claffey N. Non-surgical treatment of peri-implant mucositis and peri-implantitis: a literature review. J Clin Periodontol. 2008; 35:305-15.
11. Subramani K, Wismeijer D. Decontamination of titanium implant surface and re-osseointegration to treat peri-implantitis: a literature review. Int J Oral Maxillofac Implants. 2012; 27(5).
12. Lindhe J, Meyle J. Group D of the European Workshop on Periodontology. Peri-implant diseases: consensus report of the sixth European workshop on periodontology. J Clin Periodontol. 2008; 35:282-5.
13. Schwarz F, Schmucker A, Becker J. Efficacy of alternative or adjunctive measures to conventional treatment of peri-implant mucositis and peri-implantitis: A systematic review and meta-analysis. Int J Implant Denti. 2015; 1(1):22.
14. del Amo FS, Yu SH, Wang HL. Non-surgical therapy for peri-implant diseases: A systematic review. J Oral Maxillofac Res. 2016; 7(3).
15. Renvert S, Polyzois I, Maguire R. Re-osseointegration on previously contaminated surfaces: A systematic review. Clin Oral Implants Res. 2009; 20:216-27.

16. Sarmiento HL, Norton M, Korostoff J, et al. Surgical alternatives for treating peri-implantitis. Int J Periodont Restorative Dent. 2018; 38:665-71.
17. Roccuzzo M, Layton DM, Roccuzzo A, et al. Clinical outcomes of peri-implantitis treatment and supportive care: A systematic review. Clin Oral Implants Res. 2018; 29:331-50.
18. Khoury F, Keeve PL, Ramanauskaite A, et al. Surgical treatment of peri-implantitis–Consensus report of working group 4. Int Dent J. 2019; 69:18-22.
19. Heitz-Mayfield LJ, Salvi GE, Mombelli A, et al. Anti-infective surgical therapy of peri-implantitis. A 12-month prospective clinical study. Clin Oral Implants Res. 2012; 23(2):205-10.
20. Lagervall M, Jansson LE. Treatment outcome in patients with peri-implantitis in a periodontal clinic: A retrospective study. J Periodontol. 2013; 84(10):1365-73.
21. Heitz-Mayfield LJ, Salvi GE, Mombelli A, et al. Supportive peri-implant therapy following anti-infective surgical peri-implantitis treatment: 5-year survival and success. Clin Oral Implants Res. 2018; 29(1):1-6.
22. Roccuzzo M, Pittoni D, Roccuzzo A, et al. Surgical treatment of peri-implantitis intrabony lesions by means of deproteinized bovine bone mineral with 10% collagen: 7-year-results. Clin Oral Implants Res. 2017; 28(12):1577-83.
23. Serino G, Sato H, Holmes P, et al. Intra-surgical vs. radiographic bone level assessments in measuring peri-implant bone loss. Clin Oral Implants Res. 2017; 28(11):1396-400.
24. Berglundh T, Wennström JL, Lindhe J. Long-term outcome of surgical treatment of peri-implantitis. A 2-11-year retrospective study. Clin Oral Implants Res. 2018; 29(4):404-10.
25. Cosgarea R, Sculean A, Shibli JA, et al. Prevalence of peri-implant diseases: A critical review on the current evidence. Braz Oral Res. 2019; 33.
26. Fransson C, Tomasi C, Pikner SS, et al. Severity and pattern of peri-implantitis-associated bone loss. J Clin Periodontol. 2010; 37(5):442-8.
27. Papantonopoulos G, Gogos C, Housos E, et al. Peri-implantitis: A complex condition with non-linear characteristics. J Clin Periodontol. 2015; 42(8):789-98.
28. Figuero E, Graziani F, Sanz I, et al. Management of peri-implant mucositis and peri-implantitis. Periodontol 2000. 2014; 66(1):255-73.
29. Sirinirund B, Garaicoa-Pazmino C, Wang HL. Effects of mechanical instrumentation with commercially available instruments used in supportive peri-implant therapy: An In Vitro Study. Int J Oral Maxillofac Implants. 2019; 34(6).

***Correspondence to:**

Ioannis Kormas, DDS

7-368 Moos Tower

515 Delaware St. SE

Minneapolis, MN 55455, USA

E-mail: korma059@umn.edu