Review Article

Modern Classification of Periodontal and Peri-Implant Diseases and Disorders

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Abstract

To diagnose as well as to treat periodontal and peri-implant diseases and conditions, a classification strategy is requisite for dentists and scientists to investigate pathogenesis, etiology, history and management of the diseases and conditions. The work-shop was co-sponsored by the American Academy of Periodontology (AAP) as well as European Federation of Periodontology (EFP) and included experts from all over the world. Reviewers and workgroups were also asked to establish pertinent case definitions and to provide diagnostic criteria to aid clinicians in the use of the new classification. This paper summarizes the proceedings of the World Workshop on the Classification of Periodontal and Peri-implant Diseases and Conditions.

Keywords: Periodontal Disease; AAP; EFP; Classification

Abbreviations

AAP: American Academy of Periodontology; EFP: European Federation of Periodontology

Introduction

The 1989 workshop accepted that periodontitis had numerous clinical presentations, rates of progression and different age of onset [7]. Based on these variables the workshop categorized periodontitis as prepubertal, juvenile (localized and generalized), adult, and rapidly progressive. The 1993 European Workshop determined that the classification should be simplified and proposed grouping of periodontitis into two major headings: adult and early onset periodontitis [7]. The 1996 workshop participants determined that there was insufficient new evidence to change the classification.[10] Major changes were made in the 1999 classification of periodontitis, [11] which has been in use for the last 19 years. Periodontitis was reclassified as chronic, aggressive (localized and generalized), necrotizing and as a manifestation of systemic disease. Since the 1999 workshop, substantial new information has emerged from population studies, basic science investigations, and the evidence from prospective studies evaluating environmental and systemic risk factors. The analysis of this evidence

has prompted the 2017 workshop to develop a new classification framework for periodontitis [14].

In March 2018 [1]. The American Academy of Periodontology and the European Society of Periodontology publish the Journal of Clinical Periodontology (represented by the European Society of Periodontology) and the Journal of Periodontology (represented by the American Academy of Periodontology) for the development of a revised classification for periodontal and peri-implant conditions and diseases. The history of classification of periodontal diseases goes back to 1989 and two new data from basic, translational and clinical studies require re-evaluation of the classification scheme. This modern classification system replaces the previous system introduced in 1999 [3].

The latest classification system divides "periodontal disease and periodontal conditions" into 3 categories with a total of 11 subcategories and "peri-implant diseases and conditions" into 4 subcategories. Each subcategory falls under a specific condition under "Periodontal Diseases and Conditions".

The latest classification system has important changes from the 1999 system that should be highlighted.

- Gingivitis is believed to be reversible, but once a patient develops periodontal disease, it is diagnosed for life time, even if the periodontal disease is successfully treated. So maintenance is essential.
- 2. Periodontitis was classified into four categories in the 1999 classification: chronic, aggressive (both localized and generalized), necrotic and systemic manifestations. As of 2018, periodontitis has been classified into three categories: necrotizing, periodontitis as a manifestation of systemic disease, and periodontitis. In the case of the latter, the distinction between chronic and aggressive has been removed. Instead, multilevel staging criteria, range and distribution, and grading were introduced. Staging depends on the severity of the disease and the difficulty of managing the disease. The extent and distribution are currently defined as localized and generalized. Grading depends on predicting disease progression and response to treatment.
- Systemic diseases with periodontal manifestations (such as Papillon-Lefebvre syndrome) are classified according to the underlying systemic disease using the International Statistical Classification of Diseases and Related Health Problems (ICD).
- Mucogingival conditions are classified based on loss of interproximal attachment and exposure of root at the cementoenamel junction.
- The new classification system includes peri-implant mucositis, peri-implant health, peri-implantitis (supporting bone and mucosal tissue), hard defects affected by tissue loss due to previous severe periodontal support loss or endodontic infection).

Materials and Methods

Working Group 1 discussed on an intact and a reduced periodontium[6]periodontal health and gingival diseases and conditions. This includes patients with completely healthy periodontal tissue (no bone loss or attachment loss) and patients with reduced but stable periodontal tissue (treatment of periodontitis or periodontal disease). Gingival disease is divided into two categories caused by biofilm and not caused by biofilm. Examples of the latter include human papilloma virus manifestations such as hereditary gingival fibromatosis and verruca vulgaris.

Working group 2 discussed the classification of periodontitis, especially the subclassification based on staging and grading.[7]Staging is divided into 4 categories (I, II, III, and IV) and depends on severity, complexity, extent and distribution. Grading is based on key criteria and other modifiers. Similar details are provided for necrotizing periodontal disease, Endo-perio, and periodontal abscess.

Working group 3 discussed systemic disease manifestations with periodontitis as well as developmental and acquired conditions. Smoking was emphasized. Another important point to note is that excessive occlusal forces do not cause attachment loss, but may cause mobility of the teeth.

Workgroup 3 discussed manifestations of systemic diseases with periodontitis, as well as developmental and acquired conditions.[8] The differences between rare systemic conditions (e.g., Papillon–Lefèvre syndrome) which have distinct periodontal manifestations and modification of periodontal disease by disorders such diabetes, or modifiers such as cigarette smoking were highlighted. Another key point is the observation that excessive occlusal forces do not result in attachment loss but can result in tooth mobility.

Working group 4 discussed diseases and disorders surrounding implants. Plaque/biofilm was identified as the main cause of peri-implant mucositis. Peri-implantitis indicates inflammation of the mucosal tissue and loss of bone support. Nevertheless, the discussion emphasized the fact that there are many types of dental implants with different designs (including surface features).

Results and Discussion

Extent and distribution

- Localized (< 30% of teeth)
- Generalized (> 30% of teeth)
- Molar incisor distribution

Grading

- Grade A: Slow rate of progression
- Grade B: Moderate rate of progression
- Grade C: Rapid rate of progression

Anticipated treatment response: Case phenotype, smoking, hyperglycemia.

Stages	Severity and complexity of management
Stage I	Initial
Stage II	Moderate
Stage III	Severe with potential for tooth loss
Stage IV	Severe with potential loss of the dentition

Table 1: Periodontitis.

- **Severity:** Interdental attachment loss at the site with greatest loss; radiographic bone loss and tooth loss

- **Complexity of management:** probing depths; pattern of bone loss, furcation lesions, number of remaining teeth, tooth mobility, ridge defects, masticatory dysfunction.

Stage of periodontitis		Stage I	Stage II	Stage III	Stage IV
Severity	Interdental CAL at site with greatest loss	1 to 2 mm	2 to 3 mm	≥5 mm	≥5 mm
	Radiographic bone loss	Coronal 1/3rd (<15%)	Coronal 1/3rd (15% to 33%)	Extends to mid-1/3rd of root and beyond	Extends to mid-1/3rd of root and beyond
	Tooth loss	No tooth loss caused by periodontitis	No tooth loss caused by periodontitis	≤4 teeth lost due to periodontitis	≥5 teeth lost due to periodontitis
Complexity	Local	Maximum probing depth ≤4mm, with mainly horizontal bone loss	Maximum probing depth ≤5mm, with mainly horizontal bone loss	In addition to stage II probing depth ≥6mm, Vertical bone loss ≥3mm Furcation involvement class II or III Moderate ridge defect	In addition to stage III: need for complex rehabilitation because of : Masticatory dysfunction, secondary occlusal trauma (tooth mobility degree ≥2) severe ridge defect, bite collapse, drifting, flaring, <20 remaining teeth (10 opposing pairs)

Table 2: Classification of periodontitis based on stages defined by severity (according to the level of interdental clinical attachment loss, radiographic bone loss and tooth loss), complexity and extent and distribution.

Periodontitis grade		Grade A: slow rate of progression	Grade B: Moderate rate of progression	Grade C: Rapid rate of progression	Stage IV
Primary criteria	Direct evidence of progression	Longitudinal data (CAL/ radiographic bone loss)	No evidence of bone loss over 5 years	<2mm loss over 5 years	≥2mm loss over 5 years
	Indirect evidence of progression	%bone loss/age	<0.25	0.25 to 1.0	>1.0
		Case phenotype	Heavy biofilm with levels of destruction	Destruction commensuate with biofilm deposits	Destruction greater than expectation given the biofilm deposits; specific clinical patterns suggestive of periods of rapid progression and/early onset disease (e.g molar/incisor pattern; lack of expected response to standard bacterial control therapies)
Grade modifiers	Risk factors	Smoking	Non smoker	Smoker <10 cigarettes /day	≥10 cigarettes /day
		Diabetes	Normoglycemic/no diagnosis of diabetes	HbA1c <7.0% in patients with diabetes	HbA1c ≥7.0% in patients with diabetes

Table 3: Classification of periodontitis based on grades that reflect biologic features of the disease including evidence of, or risk for, rapid progression, anticipated treatment response, and effects on systemic health.
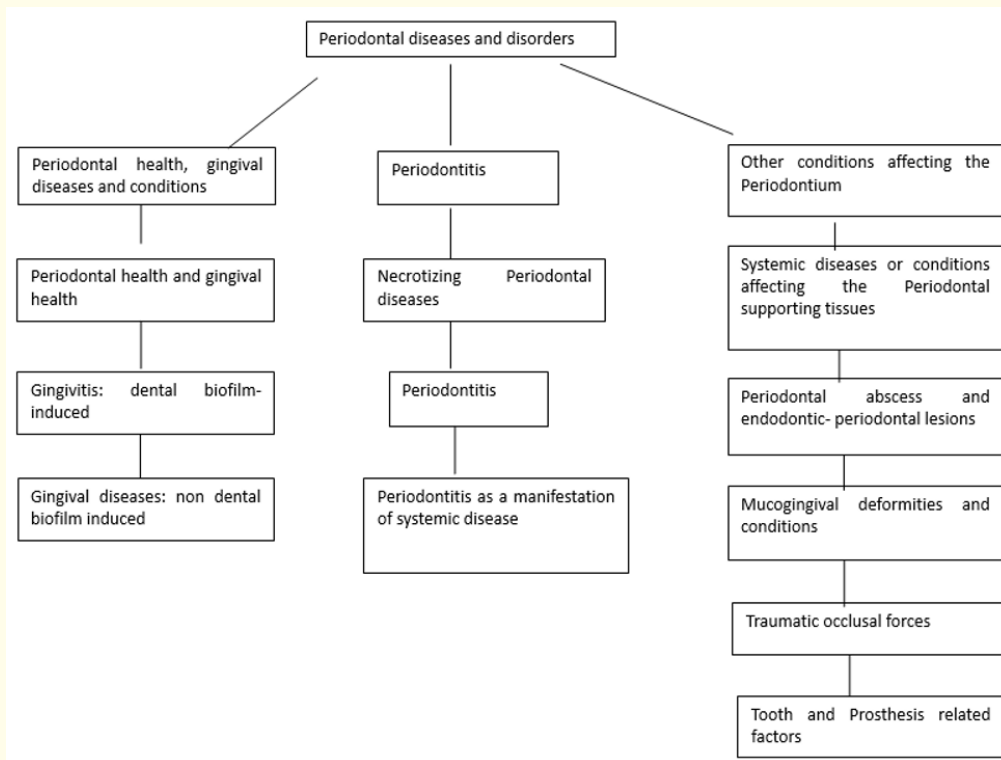
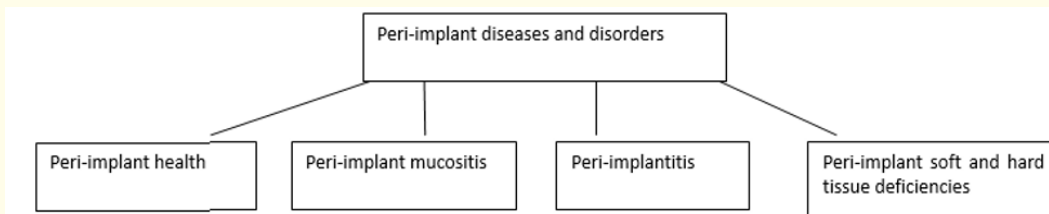**Figure 1:** Classification of periodontal and peri-implant diseases and conditions-2017.

Figure 2: Peri-implant diseases and conditions.

Conclusion

This new classification system relies on the extensive literature on periodontal disorders and dental implants to justify the new design. The new classification system aims to "provide a globally consistent approach to diagnosis and management and ultimately improve outcomes" for patients.

Acknowledgements

Nil.

Conflict of Interest

Nil.

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