ASPECTS REGARDING THE NEW CLASSIFICATION OF PERIODONTAL DISEASES.

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Abstract:
The 2017 World Workshop Classification system for periodontal and peri-implant diseases and conditions was developed in order to accommodate advances in knowledge derived from both biological and clinical research, that have emerged since the 1999 International Classification of Periodontal Diseases. The result is a redesigned disease classification framework that guides comprehensive treatment planning and allows for a personalized approach to patient care. Highlights from the updated classification include a multi-dimensional staging and grading system for periodontitis classification, a recategorization of various forms of periodontitis, and the inaugural classification for peri-implant diseases and conditions. Of extreme importance, the new classification includes clinical health for the first time, and distinguishes an intact and a reduced periodontium throughout. Also, the term 'aggressive periodontitis' was removed, creating a staging and grading system for periodontitis that is based primarily upon attachment and bone loss and classifies the disease into four stages based on severity (I, II, III or IV) and three grades based on disease susceptibility (A, B or C).
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In the last 30 years, the periodontitis classification has been repeatedly modified in an attempt to have a result of emerging science. The 2017 Workshop agreed that, according to current knowledge of pathophysiology, three forms of periodontitis can be identified: necrotizing periodontitis [1], periodontitis as a manifestation of systemic diseases [2] and forms of disease previously recognized as "chronic" or "aggressive", now grouped under one category, "periodontitis" [3].

Table 1 Classification of periodontal and peri-implantary diseases (after Caton)

Periodontal diseases
1. **Periodontal health, gingival disease**
1.1 Periodontal health
1.2 Gingivitis induced by bacterial plaque
1.3 Gingivitis non-induced by bacterial plaque
2. **Periodontitis**
2.1 Necrotizing periodontal diseases
2.2 Periodontitis
2.3 Periodontitis as a manifestation of systemic diseases
3. **Other periodontal diseases**
3.1 Systemic disorders affecting deep periodontal tissues
3.2 Periodontal abscess and endo-periodontal lesions
3.3 Muco-gingival lesions and affections

3.4 Traumatic occlusal forces
3.5 Dental-prosthetic factors
Peri-implantary diseases
1. Peri-implantary health
2. Peri-implantary mucositis
3. Peri-implantitis
4. Deficit of hard and soft peri-implantary tissues

In reviewing the classification, the workshop agreed on a periodontal classification framework, further characterized by a multidimensional staging and classification system that could be adapted over time as new evidence emerges [4] (Table 1 - Table 5).

Staging is largely dependent on the severity of the disease as well as the complexity of disease management, while the classification provides additional information on the biological characteristics of the disease, including a history-based analysis of the disease progression rate, risk assessment of subsequent progression, anticipation of poor treatment outcomes and the assessment of the risk that the disease or its treatment will adversely affect the general health of the patient [3].

Table 2 Periodontal health, gingival diseases (after Caton)

1. Periodontal health
a. Periodontal health in sound periodontium
b. Periodontal health in reduced periodontium
i. Stable periodontitis patient
ii. Patient without periodontitis
2. Gingivitis induced by bacterial plaque
a. Associated only with bacterial biofilm
b. Associated with systemic and/or local factors
c. Drug-induced gingival overgrowths
3. Gingivitis non-induced by bacterial plaque
a. Genetic / developmental disorders
b. Specific infections
c. Inflammatory and immune disorders
d. Reactive processes
e. Neoplasms
f. Endocrine, nutritional and metabolic diseases
g. Traumatic injuries
h. Gingival pigmentations

Staging involves four categories (Stages 1-4) and is determined by examining several variables including clinical loss of attachment, bone loss percentage and probing depth, presence and magnitude of vertical bone defects and involvement of tooth decay, tooth mobility and periodontitis tooth loss. The classification includes three levels (grade A - low risk, grade B - moderate risk, grade C - high risk for progression) and includes, in addition to aspects related to the progression of periodontitis, general health status and other exposures such as smoking and metabolic control in diabetes. Thus, classification allows the clinician to integrate individual patient factors into diagnosis, which are essential for complex case management (Table 3).

The new classification of diseases and periodontal diseases also includes systemic diseases and disorders affecting periodontal support tissues [2]. It is recognized that there are

rare systemic disorders, such as Papillon Lefèvre syndrome, which generally lead to the early development of severe periodontitis. Such conditions are grouped under the name "periodontitis as a manifestation of systemic diseases", and the classification should be based on primary systemic disease.

Table 3 Periodontitis forms (after Caton)

1.	**Necrotizing periodontal diseases**
	a. Necrotizing gingivitis
	b. Necrotizing periodontitis
	c. Necrotizing stomatitis
2.	**Periodontitis as a manifestation of systemic diseases**
3.	**Periodontitis**
	a. Stages (based on severity and complexity of therapeutic management)
	Stage I: Initial periodontitis
	Stage II: Moderate periodontitis
	Stage III: Severe periodontitis with risk of tooth loss
	Stage IV: Severe periodontitis with risk of dentition loss
	b. Extension and distribution: Localized, generalized, molar-incisive distribution
	c. Grades: Evidence and risk of rapid progression, anticipated therapeutic response
	Grade A: Slow rate of progression
	Grade B: Moderate rate of progression
	Grade C: Rapid rate of progression
Severity: Level of clinical interdental attachment at the site with the most severe loss; radiologically detectable losses, dental loss **Complexity of management:** probing depth, bone loss pattern, tooth lesions, number of present teeth, dental mobility, crest defects, masticatory dysfunction **Localized form:** <30% of teeth; generalized form:> 30% of the teeth **Progression risk:** Direct or indirect evidence of attachment loss (bone loss / age ratio) **Anticipated response to treatment**: phenotype, smoking, hyperglycemia	

Table 4 Periodontal manifestations of systemic diseases and other developmental or acquired diseases (after Caton)

1.	**Diseases and systemic conditions that affect periodontal tissues**
2.	**Other periodontal diseases**
	a. Periodontal abscess
	b. Endo-periodontal lesions
3.	**Lesions and muco-gingival conditions**
	a. The gingival phenotype
	b. Gingival / soft tissue recession
	c. Absence of gingival tissue
	d. Low vestibule depth
	e. Aberrant muscle or frenum position
	f. Gingival excess
	g. Abnormal colour
	h. Affections of the exposed root surface
4.	**Traumatic occlusal forces**
	a. Primary occlusal trauma
	b. Secondary occlusal trauma
	c. Orthodontic forces
5.	**Dental-prosthetic factors that alter or predispose to gingival diseases induced by the bacterial plaque**

a. Dental local factors
b. Prosthetic local factors

Other systemic conditions, such as neoplastic disease, may affect the periodontal system independent of periodontitis induced by the dental plaque [6] and such clinical findings should also be classified on the basis of primary systemic disease and grouped as "Systemic diseases or disorders affecting deep periodontal tissues ".

There are however common systemic illnesses, such as uncontrolled diabetes, with variable effects that alter the progression of periodontitis. They appear to be part of the multifactorial nature of complex diseases such as periodontitis and are included in the new clinical classification of periodontitis as a descriptor in the process of staging [4]. Although regular modifiers of periodontitis can substantially alter the onset of disease, severity and response to treatment, current evidence does not support a single pathophysiology in patients with diabetes and periodontitis.

The new definitions of cases related to the treatment of gingival recession are based on the interproximal loss of clinical attachment and also include the evaluation of the exposed root and the enamel-cement junction [7]. The report presents a new classification of the gingival recession that combines clinical parameters, gingival phenotype, and features of the exposed root surface. In the consensus report, the term of periodontal biotype was replaced by the periodontal phenotype (Table 4) [6].

Traumatic occlusive force, replacing the term excessive occlusal force, is the force that exceeds the ability to adapt periodontal and / or teeth. Traumatic occlusal forces may cause occlusal trauma (lesions) and excessive wear or tooth fracture [6].

The section on prosthetic factors has been extended to the new classification. The term biological width has been replaced with supra-crestal attachment tissues [6].

The clinical procedures involved in making indirect restorations have been added due to new data indicating that these procedures can cause recessions and loss of clinical attachment (Table 4).

Table 5. Peri-implantary diseases and conditions (after Caton)

1. Peri-implantary health
2. Peri-implantary mucositis
3. Peri-implantitis
4. Deficit of hard and soft peri-implantary tissues

A new classification for peri-implantary health [9], peri-implantitis [10] and peri-implantary mucositis [11] was developed by the workshop (Table 5). Efforts have been made to examine all peri-implant health issues, illnesses and relevant aspects of implant site conditions and deformities to achieve consensus for this classification, which could be accepted worldwide. Case definition has been developed to be used by clinicians to manage individual cases and also to population studies [12].

Peri-implant health has been defined both clinically and histologically [9]. Clinically, peri-implant health is characterized by the absence of visual signs of inflammation and bleeding on probing. Peri-implant health may exist around implants with normal or reduced bone support. It is not possible to define a range of probing depths compatible with peri-implant health [12].

Peri-implant mucositis is characterized by bleeding on probing and visible signs of inflammation [10]. Although there is strong evidence that peri-implant mucositis is caused by the bacterial plaque, there is very limited evidence for non-plaque peri-implant mucositis. Peri-implant mucositis can be treated by measures to remove the plaque.

Peri-implant is defined as a pathological affection associated with the plaque that occurs in the tissue around the dental implants, characterized by inflammation in the peri-implant mucosa and the progressive loss of the alveolar bone. It is assumed that peri-implant mucositis precedes peri-implant. Peri-implantitis is associated with poor plaque control and patients with a history of severe periodontitis. The onset of peri-implantitis may occur as soon as the implant is placed, as indicated by radiographic data. Peri-implantitis, in the absence of treatment, seems to progress in a non-linear and accelerated model [11].

Normal healing after tooth loss results in diminishing the size of the alveolar process, resulting in both hard tissue and soft tissue deficiencies. Larger crest deficits may occur in areas associated with severe periodontal disease, post-extraction trauma, endodontic infections, root fractures, thin skirt, poor dental position, injuries and pneumonia of the maxillary sinuses. Other factors affecting the ridge may be associated with systemic medications and diseases, reducing the amount of natural bone, the agenesis of teeth, and prosthetic pressure [13].

The new periodontal classification system allows clinicians to better categorize patients' oral health based on clinical and radiographic findings. Now that the oral-systemic link is part of the classification system, it will help patients become more involved in knowing the state of their diseases. Talking to patients about their classification can lead to better treatment acceptance and understanding. The new classification is complex and will take time to fully incorporate into patient care globally.

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