

Classification of periodontal and peri-implant diseases and conditions

Part I.: Periodontal Health, Gingival Diseases and Conditions



Definition of classification

The systemic collection of data or knowledge and its arrangement in sequential manner in order to facilitate its understanding or knowledge.

Used for a variety of applications:

- ❖ Identification of the etiology and understanding of the pathology
- ❖ knowledge-based and decision support system
- ❖ statistical analysis of diseases and therapeutic actions
- ❖ direct surveillance of epidemic or pandemic outbreaks
- ❖ Predict treatment outcomes

Historical development

- Until 1920: after clinical symptoms. Eg.: „*Pyorrhoe alveolaris*”
- From 1930 until 1970: classical pathology paradigm. Eg.: degenerative or destructive periodontal disease: „*Periodontosis*”
- From 1980: infection-host response paradigm
- Modern classifications: combines every aspects



Clinical characteristics paradigm

G.V. Black classification (1889):

- Constitutional gingivitis
- Painfull form of gingivitis
- Simple gingivitis
- Inflammation of the periodontal membrane due to calculus
- Suppurative pericementitis

Classical pathology paradigm

Gottlieb and Orban histopathological surveys

Orban classification (1942):

1. Inflammation
2. Degeneration (*periodontosis*)
3. Atrophy
4. Hypertrophia
5. Pathologic reaction produced by occlusal trauma

Infection-inflammatory respons principles

- Robert Koch (1876): Germ theory
- W.D. Miller (1880's): 3 factors are considered as ethiological factor: a, bacterias; b, local irritating factors; c, systemic predisposition
- Löe et al.: experimental gingivitis
- 1977-78: „host-parasite interactions” paradigms



- **Page and Schroeder's classification**

Infection-inflammatory responses principles

Classification of the World Workshop in Clinical Periodontics (modifications of Page and Schroeder's) 1989:

- I. Adult periodontitis
- II. Early onset periodontitis
 1. Prepubertal periodontitis
 - a. Generalised
 - b. Localised
 2. Juvenile periodontitis
 1. Generalised
 2. Localised
 3. Rapidly progressing periodontitis
- III. Periodontitis associated with systemic diseases
- IV. Necrotising ulcerative periodontitis
- V. Refractory periodontitis

PREVIOUS CLASSIFICATION

➤ American Association of Periodontology (AAP)
1999

➤ Focuses:

- Etiology: dental plaque?
- Localisation: gingiva or attaching apparatus
- Ongoing disease: inactive or progressing
- Background: local factors or systemic factors

International Workshop for a Classification of Periodontal Disease and Conditions

Ann Periodontol 1999; 4:1-7

CURRENT CLASSIFICATION

- American Academy of Periodontology (AAP) and European Federation of Periodontology (EFP)

2017 Chicago:

A NEW CLASSIFICATION OF PERIODONTAL AND PERI-IMPLANT DISEASES AND CONDITIONS

- Focuses (in addition to 1999's classification):
 - Distinguish: healthy vs. diseased
 - Includes peri-implant diseases and conditions
 - Concern: severity, complexity and progression

G Caton J, Armitage G, Berglundh T, Chapple ILC, Jepsen S, Kornman K, Mealey B, Papapanou PN, Sanz M, Tonetti M. A new classification scheme for periodontal and peri-implant diseases and conditions - Introduction and key changes from the 1999 classification. *J Clin Periodontol.* 2018 Jun;45 Suppl 20:S1-S8

A NEW CLASSIFICATION OF PERIODONTAL AND PERI-IMPLANT DISEASES AND CONDITIONS

Periodontal Health, Gingival Diseases and Conditions

- Periodontal and Gingival Health
- Gingivitis: Dental-Biofilm Induced
- Gingival Diseases: Non-Dental Biofilm Induced

Periodontitis

- Necrotizing Periodontal Diseases
- Periodontitis
- Periodontitis as a Manifestation of Systemic Disease

Other conditions Affecting the Periodontium

- Systemic Diseases or Conditions Affecting the Periodontal Supporting Tissues
- Periodontal Abscesses and Endo-Periodontal Lesions
- Mucogingival Deformities and Conditions
- Traumatic Occlusal Forces
- Tooth and Prosthesis Related Factors

Peri-implant diseases and conditions

- Peri-implant Health
- Peri-implant Mucositis
- Peri-implantitis
- Peri-implant Soft and hard Tissue Deficiencies

Periodontal Health, Gingival Diseases and Conditions

A. *Periodontal Health and Gingival Health*

1. Clinical gingival health on an intact periodontium
2. Clinical gingival health on a reduced periodontium

B. *Gingivitis- dental biofilm induced*

1. Associated with dental biofilm alone
2. Mediated by systemic or local risk factors
3. Drug-influenced gingival enlargements

C. *Gingival diseases- non-dental biofilm induced*

1. Genetic/ developmental disorders
2. Specific infection
3. Inflammatory and immune conditions
4. Reactive processes
5. Neoplasms
6. Endocrine, nutritional & metabolic diseases
7. Traumatic lesions (iatrogenic, accidental)
8. Gingival pigmentation

Periodontal Health, Gingival Diseases and Conditions

A. *Periodontal Health and Gingival Health*

1. *Clinical gingival health on an intact periodontium*
 - i. *Absolut healthy, pristine*
 - ii. *Clinically healthy periodontium*
2. *Clinical gingival health on a reduced periodontium*
 - i. *Periodontitis patient (stable or partially controlled)*
 - ii. *Non- periodontitis patient*



Clinical gingival health on an INTACT periodontium

i. Absolut healthy, pristine

- Structurally and clinically absolute intact (super healthy) periodontium
- No inflammation, no bone loss
- Morphological features of a healthy attached gingiva
- Physiological immune defense
- Extremely rare



Clinical gingival health on an INTACT periodontium

ii. Clinically healthy periodontium

- Structurally and clinically still intact periodontium
- No or minimal (maximum 1-2 sites of BOP) inflammation, no bone loss
- Morphological features of a healthy attached gingiva
- Physiological immune defense
- Mainly in young age



Periodontal Health, Gingival Diseases and Conditions

A. Periodontal Health and Gingival Health

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Clinical gingival health on a REDUCED periodontium

i. Periodontitis patient- STABLE, CONTROLLED

- After successful periodontal treatment
- No inflammation,
- Previous attachment loss
- Successful plaque- control, elimination of plaque retentive factors
- AND successful control of systemic and behavioral risk factors
- Good prognosis



Clinical gingival health on a REDUCED periodontium

i. Periodontitis patient- PARTIALLY CONTROLLED

- After periodontal treatment
- Controlled progression of periodontitis
- Relatively no inflammation,
- Previous attachment loss
- NOT successful control of systemic and behavioral risk factors
- AIM: to control progression with frequent SPT



Clinical gingival health on a REDUCED periodontium

ii. Non- periodontitis patient-STABLE

- Miller Class I-II patients
- No inflammation, good plaque control
- Intact interdental bone and papilla
- Good prognosis



Periodontal Health, Gingival Diseases and Conditions

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Characteristic of gingivitis- dental biofilm induced

1. PLAQUE PRESENT AT GINGIVAL MARGIN
2. DISEASE BEGINS AT THE GINGIVAL MARGIN
3. CHANGE IN GINGIVAL COLOR → RUBOR
4. CHANGE IN GINGIVAL CONTOUR → TUMOR
5. SULCULAR TEMPERATURE CHANGE → CALOR
6. INCREASED GINGIVAL EXUDATE → DOLOR?
7. BLEEDING UPON PROVOCATION → FUNCTIO LAESA
8. ABSENCE OF ATTACHMENT LOSS
9. ABSENCE OF BONE LOSS
10. HISTOLOGICAL CHANGES
11. REVERSIBLE WITH PLAQUE REMOVAL

Periodontal Health, Gingival Diseases and Conditions

B. Gingivitis- dental biofilm induced

1. Associated with dental biofilm alone
2. Mediated by systemic or local risk factors
 - i. Systemic factors
 - a) Sexual steroid hormones (puberty-, menstrual cycle-, pregnancy-, oral contraceptive -associated)
 - b) Hyperglycemia
 - c) Leukemia
 - d) Malnutrition
 - ii. Local factors
 - a) Anatomical
 - b) Pathological
 - c) Iatrogenic
3. Drug-influenced gingival enlargements



Gingivitis associated with dental BIOFILM ALONE



RUBOR
TUMOR
CALOR
DOLOR?
FUNCTIO LAESA

Periodontal Health, Gingival Diseases and Conditions

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Gingivitis mediated by SYSTEMIC factors

a) Sexual steroid hormones (SSH)

- Women: SSH receptors in gingiva
- Amplifies inflammatory reaction, dose dependent:
(sulcular exudate and temperature \uparrow , BOP \uparrow , gingival contour \uparrow)
- Puberty: transitional effect
- Menstrual cycle: few women is involved. Prior and during ovulation
- Oral contraceptives: minimal dose and effect
- Pregnancy: 2nd or 3rd trimester, gingivitis or pyogenic granuloma!!!

Puberty



Menstrual cycle



Oral contraceptives



Pregnancy associated GINGIVITIS



Gingivitis mediated by SYSTEMIC factors

b) Hyperglycemia

- Most commonly associated in children with poorly controlled Type I diabetes
- Pronounced inflammatory response of the gingiva
- In adults the Type II diabetes is important risk factor of periodontitis



Gingivitis mediated by SYSTEMIC factors

c) Leukamie

1. PRONOUNCED INFLAMMATORY RESPONSE OF GINGIVA IN RELATION TO THE PLAQUE PRESENT BUT PLAQUE IS NOT A PREREQUISITE FOR ORAL LESIONS
2. GINGIVAL LESIONS ARE PRIMARILY FOUND IN ACUTE LEUKEMIA
3. CHANGE IN GINGIVA COLOR
4. CHANGE IN GINGIVAL CONTOUR WITH POSSIBLE GINGIVAL ENLARGEMENTS
5. ENLARGEMENT FIRST OBSERVED AT THE INTERDENTAL PAPILLA
6. BLEEDING UPON PROVOCATION - MAY BE ONE OF THE EARLIEST SIGN
7. REDUCTION IN DENTAL PLAQUE CAN LIMIT THE SEVERITY OF LESION

Gingivitis mediated by SYSTEMIC factors

Leukemia-associated gingivitis



- BOP ↑↑↑ (spontaneously)
- GINGIVAL ENLARGEMENT
- GINGIVAL ULCERATIONS
- ANEMIA, CYANOTIC DISCOLORATION



Gingivitis mediated by *SYSTEMIC* factors

Leukemia-associated gingivitis



Gingivitis mediated by *SYSTEMIC* factors

d) Smoking

- Nicotine causes vasoconstriction: BOP↓, dose dependent
- Reduces oxidation in the sulcus, helps the development of peridontopathogenes
- Leading risk factor in periodontitis



Gingivitis mediated by SYSTEMIC factors

e) Malnutrition

- Ascorbic acid deficiency (scurvy) gingivitis



- Protein deficiency (NOMA)



Periodontal Health, Gingival Diseases and Conditions

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3. Drug-influenced gingival enlargements

Gingivitis mediated by LOCAL factors

a) Anatomical

Pseudofurcation



Palatal sulcus



Enamel pearl



Gingivitis mediated by LOCAL factors

b) Pathological

Teeth crowding



Occlusal anomalies



Xerostomia



Gingivitis mediated by LOCAL factors

c) Iatrogenic

Crown overhangs



Filling overhangs



Overcontoured margins



Periodontal Health, Gingival Diseases and Conditions

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3. Drug-influenced gingival enlargements

Drug influenced gingival enlargements

1. VARIATION IN INTERPATIENT AND INPATIENT PATTERN
2. PREDILECTION FOR ANTERIOR TEETH
3. HIGHER PREVALENCE IN CHILDREN
4. ONSET WITHIN 3 MONTH
5. CHANGE IN GINGIVAL CONTOUR LEADING TO MODIFICATION OF GINGIVAL SIZE
6. ENLARGEMENT FIRST OBSERVED AT THE INTERDENTAL PAPILLA
7. CHANGE IN GINGIVAL COLOR
8. INCREASED GINGIVAL EXUDATE
9. BLEEDING UPON PROVOCATION
10. FOUND IN GINGIVA WITH OR WITHOUT BONE LOSS BUT IS NOT ASSOCIATED WITH ATTACHMENT LOSS
11. PRONOUNCED INFLAMMATORY RESPONSE OF GINGIVA IN RELATION TO THE PLAQUE PRESENT
12. REDUCTION IN DENTAL PLAQUE CAN LIMIT THE SEVERITY OF LESION
13. MOST ARE USING PHENYTOIN, CYCLOSPORINE A OR SECRETION CALCIUM CHANNEL BLOCKERS. THE PLASMA CONCENTRATIONS TO INDUCE THE LESION HAVE NOT BEEN CLEARLY DEFINED IN HUMANS

Dilantin (phenytoin)
Ca channel blockers
Cyclosporin-A



Drug influenced gingival enlargements- Dilantin (phenytoin)

Fibroblast \uparrow , collagenase \downarrow



Drug influenced gingival enlargements- Ca-channel blockers

Ca-metabolism disorder: proteinsynthesis \uparrow , collagenase \downarrow
prostaglandin stimulation



Drug influenced gingival enlargements- Cyclosporin-A

Fibroblast activity ↑ phagocytosis of fibroblast ↓



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C. Gingival diseases- non-dental biofilm induced

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Periodontal Health, Gingival Diseases and Conditions

C. *Gingival diseases- non-dental biofilm induced*

1. Genetic/ developmental disorders

- a. hereditary gingival fibromatosis
- b. other



Periodontal Health, Gingival Diseases and Conditions

C. *Gingival diseases- non-dental biofilm induced*

1. Genetic/ developmental disorders

- a. hereditary gingival fibromatosis
- b. other

Tubercular fibrosis



Periodontal Health, Gingival Diseases and Conditions

C. *Gingival diseases- non-dental biofilm induced*

2. *Specific infection*

a. *Bacterial*

- a. *Necrotizing gingivitis*
- b. *Neisseria gonorrhoea-associated lesions*
- c. *Treponema pallidum-associated lesions*
- d. *streptococcal species-associated lesions*
- e. *other*

Necrotizing gingivitis (NG)

- *Treponema, Fusobacterium, Selenomonas, Prevotella int. spp.*
- Smoking, stress, malnutrition, immunodeficiency (HIV/AIDS), neglected OH
- Necrosis on marginal gingiva (papillary initiation)
- Painful, fetor ex ore



Necrotizing periodontal diseases(NPD)



Maxilla:
NG

Mandibule:
NP(eriodontitis)

Periodontal Health, Gingival Diseases and Conditions

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2. *Specific infection*

- a. Bacterial
 - a. *Necrotizing gingivitis*
 - b. *Neisseria gonorrhoea-associated lesions*
 - c. *Treponema pallidum-associated lesions*
 - d. *streptococcal species-associated lesions*
 - e. *other*



Periodontal Health, Gingival Diseases and Conditions

C. *Gingival diseases- non-dental biofilm induced*

2. Specific infection

b. Viral

i. herpesvirus infections

- primary herpetic gingivostomatitis (*HHV-1,2*)
- recurrent oral herpes (*HHV-1,2*)
- Trigeminal herpes zoster infections

ii. other



Periodontal Health, Gingival Diseases and Conditions

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i. herpesvirus infections

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Periodontal Health, Gingival Diseases and Conditions

C. *Gingival diseases- non-dental biofilm induced*

2. Specific infection

b. Viral

- i. herpesvirus infections
 - primary herpetic gingivostomatitis
 - recurrent oral herpes
 - Trigeminal herpes zoster infections (*Varicella Zoster*)
- ii. other



Periodontal Health, Gingival Diseases and Conditions

C. *Gingival diseases- non-dental biofilm induced*

2. Specific infection

b. Viral

- i. herpesvirus infections
 - primary herpetic gingivostomatitis
 - recurrent oral herpes
 - Trigeminal herpes zoster infections
- ii. Other (*HPV* infection)

Verruca vulgaris



Papilloma



Gingival carcinoma



Periodontal Health, Gingival Diseases and Conditions

C. *Gingival diseases- non-dental biofilm induced*

2. Specific infection

- c. Fungal
 - i. Candida-species infections (*Candida albicans*)
 - Generalised gingival candidosis
 - ii. histoplasmosis (*Histoplasma capsulatum*)
 - iii. other

Acute pseudomembranous



Chronic erythematous



Periodontal Health, Gingival Diseases and Conditions

C. *Gingival diseases- non-dental biofilm induced*

3. Inflammatory and immune conditions

- a) Hypersensitive reactions
 - i. Contact allergy
 - ii. Plasma-cell gingivitis
 - iii. Erythema multiforme
- b) Autoimmune and mucocutaneous disorders
 - i. Pemphigus vulgaris
 - ii. Pemphigoid
 - iii. Lichen planus
 - iv. Lupus erythematosus
 - v. others
- c) Orofacial granulomatosis
 - i. Crohn's disease
 - ii. Sarcoidosis

Periodontal Health, Gingival Diseases and Conditions

C. *Gingival diseases- non-dental biofilm induced*

3. Inflammatory and immune conditions

a) Hypersensitive reactions

i. Contact allergy

- dental restorative materials
 - nickel
 - acrylic
 - mercury
- oral hygienic materials
 - toothpastes
 - mouth rinses
 - chewing gum



Gingival response:
DESQUAMATIVE GINGIVITIS

DON'T
FORGET



DESQUAMATIVE GINGIVITIS

Periodontal Health, Gingival Diseases and Conditions

C. *Gingival diseases- non-dental biofilm induced*

3. Inflammatory and immune conditions

a) Hypersensitive reactions

iii. Erythema multiforme



Periodontal Health, Gingival Diseases and Conditions

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b) Autoimmune and mucocutaneous disorders

i. Pemphigus vulgaris

ii. Pemphigoid

iii. Lichen planus

iv. others



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Periodontal Health, Gingival Diseases and Conditions

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Periodontal Health, Gingival Diseases and Conditions

C. *Gingival diseases- non-dental biofilm induced*

3. Inflammatory and immune conditions

- b) Autoimmune and mucocutaneous disorders
 - i. Pemphigus vulgaris
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 - iv. Lupus erythematosus
 - v. others



Periodontal Health, Gingival Diseases and Conditions

C. *Gingival diseases- non-dental biofilm induced*

4. Reactive processes

- a) Epulis
 - i. Fibrous epulis
 - ii. Calcifying fibroblastic granuloma
 - iii. Pyogenic granuloma
 - iv. Giant cell granuloma



Periodontal Health, Gingival Diseases and Conditions

C. *Gingival diseases- non-dental biofilm induced*

4. Reactive processes

a) Epulis

- i. Fibrous epulis
- ii. Calcifying fibroblastic granuloma
- iii. Pyogenic granuloma
- iv. Giant cell granuloma



Pregnancy associated PYOGENIC GRANULOMA



1. PLAQUE PRESENT AT GINGIVAL MARGIN
2. PRONOUNCED INFLAMMATORY RESPONSE OF GINGIVA
3. CAN OCCUR ANYTIME DURING PREGNANCY
4. MORE COMMON IN MAXILLA
5. MORE COMMON INTERPROXIMALLY
6. SESSILE OR PEDUNCULATED PROTUBERANT MASS
7. NOT A NEOPLASM; HAS HISTOLOGIC APPEARANCE OF A PYOGENIC GRANULOMA
8. REGRESSES FOLLOWING PARTURITION

Periodontal Health, Gingival Diseases and Conditions

C. *Gingival diseases- non-dental biofilm induced*

5. Neoplasms

- a) Premalignant
 - i. Leukoplakie
 - ii. Erythroplakie
- b) Malignant
 - i. Carcinoma
 - ii. Leukemia



Periodontal Health, Gingival Diseases and Conditions

C. *Gingival diseases- non-dental biofilm induced*

5. Neoplasms

- a) Premalignant
 - i. Leukoplakie
 - ii. Erythroplakie
- b) Malignant
 - i. Carcinoma
 - ii. Leukemia



Periodontal Health, Gingival Diseases and Conditions

C. *Gingival diseases- non-dental biofilm induced*

6. Endocrine, nutritional & metabolic diseases

- a) Vitamin deficiency
 - Scurvy (Vitamin C)



Periodontal Health, Gingival Diseases and Conditions

C. *Gingival diseases- non-dental biofilm induced*

7. Traumatic laesions

- a. physical injury
- b. chemical injury
- c. thermal injury



Mechanical hyperkeratosis



Cotton roll



Brushing related erosions

Periodontal Health, Gingival Diseases and Conditions

C. *Gingival diseases- non-dental biofilm induced*

7. Traumatic laesions

- a. physical injury
- b. chemical injury
- c. thermal injury

- Acids
- Hydrogen peroxide
- Acetylsalicylic-acid
- Cocaine
- Chlorhexidine
- Components of dentifrices



Aspirin

Periodontal Health, Gingival Diseases and Conditions

C. *Gingival diseases- non-dental biofilm induced*

7. Traumatic laesions

- a. physical injury
- b. chemical injury
- c. thermal injury

Radiofrequency device



Periodontal Health, Gingival Diseases and Conditions

C. *Gingival diseases- non-dental biofilm induced*

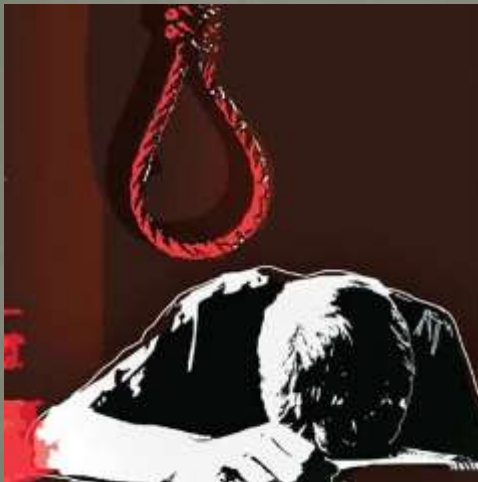
8. **Gingival pigmentation**

- a. Melonoplakie
- b. Smoking related melanosis
- c. Drug-related pigmentation
- d. Amalgam tattoo

Amalgam tattoo



Good luck for learning classification



THANK YOU
FOR YOUR
KIND
ATTENTION