Lecture:12

**Classification of periodontal diseases**  Suzan Ali

ATTEMPTS AT CLASSIFICATION

Classification of disease is necessary to try to separate conditions into dis­tinct categories so as to aid clinical and laboratory diagnosis and specific treatment. The criteria for separating diseases in this way should ideally be based on etiology, histopathology and, where appropriate, genetics rather than age of onset and rates of disease progression. Over the last three decades there have been three major attempts to classify periodontal disease.

The first of these was by the 1st World Workshop in Clinical Periodontics in 1989 (American Academy of Periodontology 1989).

The second attempt was made by the 1st European Workshop in Periodontics in 1993 (Attstrom & van der Velden 1994)

The previous classification had many shortcomings including:

1) Considerable overlap in disease categories.

2) Absence of gingival disease component.

3) Unclear classification criteria.

The third attempt was started by the American Academy of Periodontology in 1997, who organized the International Workshop for a Classification of Periodontal Diseases and Conditions in 1999. At this workshop, a new classification was agreed upon (Armitage 1999). This attempted to develop a comprehensive classification of gingival diseases, periodontitis , necrotizing ulcerative gingivitis/ periodontitis, periodontal abscesses, periodontitis associated with an endodontic lesion, developmental or acquired deformities and conditions This classification includes both separate conditions and a number of other factors which may affect their severity or clini­cal presentation and is shown in Tables 1 and 2

The main changes in this classification are:

1. The addition of a comprehensive section on **gingival diseases**.

*2.* Replacement the term of **adult periodontitis with chronic Periodontitis** since epidemiological evidence suggests that chronic periodontitis may also be seen in some adolescents.

3.  **The old term Refractory periodontitis**:

No longer considered a separate disease entity and has been excluded from the classification. Refractory can be a descriptor applied to any disease that proves non responsive to treatment

**The old term recurrent periodontitis**

Denotes the return of the disease and is not a separate disease entity and has been excluded from the classification.

Elimination of these separate categories because of the lack of evidence that they represent separate conditions but rather describe the response to treatment that result from differences in patient susceptibility.

.4. Replacement of the term "**early onset periodontitis**" with **'aggressive periodontitis**", largely because of the clinical difficulties in determining the age of onset in many of these cases.

In summary **aggressive periodontitis** was **previously** termed as **early onset periodontitis** which classified as**:**

1. Prepubertal periodontitis (preteens) localized or generalized.
2. Juvenile periodontitis (teens) localized or generalized.
3. Rapidly progressive periodontitis.

5. A new classification group of "**periodontitis as a manifestation of systemic disease'** has been created and this includes those cases of prepubertal periodontitis directly resulting from known systemicdisease.

6. There are also new group categories on **periodontal abscesses, periodontic-endodontic lesions and developmental or acquired deformities or conditions.**

In summary the classification of periodontal disease include the following 8 categories:-

I) Gingival diseases.

II) Chronic periodontitis:

1. Localized (<30% of involved sites)
2. Generalized (>30% of involved sites).

III) Aggressive periodontitis:

1. localized
2. Generalized.

IV) Periodontitis as a manifestation of systemic diseases.

V) Necrotizing periodontal diseases:

1. Necrotizing ulcerative gingivitis
2. Necrotizing ulcerative periodontitis

VI) Abscesses of the periodontium.

VII) Periodontitis associated with endodontic lesions.

VIII) Developmental or acquired deformities & conditions.

Table 1 Classification of gingival diseases:

|  |  |
| --- | --- |
| **A Plaque induced gingival disease**  **1. Gingivitis associated with dental plaque only**  **a) without other locally contributing factors**  **b) with locally contributing factors**  **2. Gingival disease modified by systemic factors**  **a) associated with endocrine system  i) puberty-associated gingivitis**  **ii) menstrual cycle-associated gingivitis**  **iii) pregnancy-associated gingivitis or pyogenic granuloma**  **iv) diabetes mellitis-associated gingiivitis**  **b) associated with blood dyscrasias**  **i) leukaemia-associated gingivitis**  **ii) other**  **3. Gingival disease modified by drugs**  **a) drug-influenced gingival diseases**  **1)drug-influenced gingival enlargment**  **2) drug-influenced gingivitis**  **a) oral contraceptive-associated gingivitis**  **b) other**  **4.Gingival disease modified by malnutrition**  **a) ascorbic acid-deficiency gingivitis**  **b) other**  **B Non plaque-induced gingival lesion**  **1. Gingival disease of specific bacterial origin**  **a) Neisseria gonorrhea-associated lesions**  **b) Treponema pallidum-associated lesions**  **c) Streptococcal species-associated lesions**  **d) other**  **2. Gingival diseases of viral origin**  **a) Herpes virus infections**  **1) primary herpetic gingivostomatitis**  **2) recurrent oral herpes**  **b) oral Epstein-Barr virus lesions**  **c) Varicella-Zoster infections**  **d) other** | **3. Gingival disease of fungal origin**  **a) Candida species infections**  **i) generalized gingival candidiasis**  **b) linear gingival erythema**  **c) Histoplasmosis**  **d) other 4. Gingival diseases of genetic origin**  **a) hereditary gingival fibromatosis**  **b) other**  **5. Gingival manifestations of systemic conditions**  **a) mucocutaneous conditions  1) lichen planus**  **2) pemphigoid**  **3) pemphigus vulgaris**  **4) erythema multiformi**  **5) lupus erythematosus**  **6) drug-induced**  **7) other**  **b) allergic reactions**  **1) dental restorative materials**  **a) mercury**  **b) nickel**  **c) acrylic**  **d) other**  **2) reactions attributable to:**  **a) toothpastes/dentifrices**  **b) mouthrinses/mouthwashes**  **c) chewing gum additives**  **d) foods and food additives**  **6. Traumatic lesions**  **(factitious,iatrogenic,accidental)**  **a) physical injury**  **b) chemical injury**  **c) thermal injury**  **7. Foreign body reactions**  **8. Not otherwise specified(NOS)** |

d)others

**Classification of Gingival Diseases**

A. **Dental plaque induced gingival diseases**

There are four main types of plaque-associated gingival diseases:

1. Gingival disease associated with dental plaque only.
2. Gingival diseases modified by systemic factors.
3. Gingival diseases modified by medications.
4. Gingival diseases modified by malnutrition.

There are common characteristics to all gingival diseases associated with plaque, modified by systemic diseases, medications and malnutrition:-

1. Signs and symptoms that are confined to the gingiva.
2. The presence of dental plaque to initiate and/or exacerbate the severity of the lesion.
3. Clinical signs of inflammation (enlarged gingival contours due to edema or fibrosis, color transition to a red and/or bluish-red hue, elevated sulcular temperature, bleeding upon stimulation, increased gingival exudate).
4. No loss of attachment.
5. Reversibility of the disease by removing the etiology .

1. **Gingival disease associated with dental plaque only:-**

It is called plaque induced gingivitis and it is inflammation of the gingiva resulting from dental plaque only, it is either

* Without local contributing factors or
* With local contributing factors.

The local contributing factors can be defined as a local feature that may influence the presentation of the disease, such as

* overhanging restoration
* Dental calculus
* Prosthetic and orthodontic appliances.

Characteristics of plaque-induced gingivitis:

1. Plaque present at gingival margin
2. Disease begins at the gingival margin
3. Change in gingival color
4. Chang in gingival contour
5. Sulcular temperature change
6. Increased gingival exudate
7. Bleeding upon provocation
8. Absence of attachment loss
9. Absence of bone loss
10. Histological changes
11. Reversible with plaque removal.

2. **Gingival diseases modified by systemic factors**:-

A. Associated with the endocrine system:

1. Puberty-associated gingivitis
2. Menstrual cycle-associated gingivitis
3. Pregnancy-associated
4. Gingivitis
5. Pyogenic granuloma or tumor
6. Diabetes mellitus-associated gingivitis

1. **Puberty-associated gingivitis**: It is pronounced inflammatory response of gingiva to dental plaque and hormones during the circumpubertal period (11-16) years.

2. **Menstrual cycle-associated gingivitis**: It is pronounced inflammatory response of the gingiva to plaque and hormones immediately prior to ovulation.

3. **a) pregnancy-associated gingivitis**: It is pronounced inflammatory response of the gingiva to dental plaque and hormones usually occurring during the second and third trimesters.

**b) pregnancy-associated pyogenic granuloma**: It is a localized, painless, protuberant, exophytic gingival mass that is attached by a sessile or pedunculated base from the gingival margin or more commonly from an interproximal space resulting from dental plaque and hormones during pregnancy.it is more common in the maxilla and may develop as early as the first trimesters, and may regress or completely disappear following parturition.

4. **Diabetes mellitus-associated gingivitis**: It is inflammatory response of the gingiva to plaque aggravated by poorly controlled plasma glucose levels.

B. **Associated with blood dyscrasias**:

1. Leukemia- associated gingivitis
2. Others

* Blood dyscrasia-associated gingivitis: gingivitis associated with abnormal function or number of blood cells.
* Leukemia-associated gingivitis: Pronounced inflammatory response of the gingiva to plaque resulting in increased bleeding and enlargement subsequent to leukemia. Gingival bleeding is a common sign in patients with leukemia and it is the initial oral sign and/or symptom in 17.7% and 4.4% of patients with acute and chronic leukemia respectively. Gingival enlargement initially begin at the interdental papilla followed by marginal and attached gingiva.

3**. Gingival diseases modified by medications**:

1. Drug-influenced gingival diseases:
2. Drug-influenced gingival enlargements
3. Drug-influenced gingivitis:
4. Oral contraceptive-associated gingivitis
5. Others

* **Drug-influenced gingival enlargement**: Gingival enlargement resulting in whole or in part from systemic drug use. Drugs that may cause gingival overgrowth include anticonvulsant (e.g. phenytoin), immunosuppressant (e.g. cyclosporine A), and calcium channel blockers (e.g. nifedipine, verapamil).

The common clinical characteristics of drug-influenced gingival enlargement include:-

1. Variation in interpatient and intrapatient pattern (genetic predisposition).
2. Predilection for anterior gingiva
3. Higher prevalence in children and younger age group
4. Onset within 3 months of use
5. Change in the 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. Pronounced inflammatory response of gingiva in relation to the plaque present
11. Reduction in dental plaque can limit the severity of the lesion.

-**Oral contraceptive-associated gingivitis**:-

Pronounced inflammatory response of the gingiva to plaque and oral contraceptive. Oral contraceptive agents are one of the most widely utilized class of drugs in the world. The features of gingivitis associated with oral contraceptive in premenopausal women are similar to plaque-induced gingivitis, except for the propensity to develop signs of gingival inflammation in the presence of relatively little plaque in women taking these hormones. The condition is reversible following discontinuation of the drug.

**4. Gingival diseases modified by malnutrition**: It is known that malnourished individuals have a compromised host defense system that may affect the susceptibility to infection.

1. Ascorbic acid-deficiency gingivitis
2. Others

* Ascorbic acid-deficiency gingivitis: Inflammatory response of the gingiva to plaque aggravated by chronically low ascorbic acid levels. The classic clinical signs of scurvy describe the gingiva as being bright red, swollen, ulcerated and susceptible to hemorrhage. It is common in certain population, with restricted diets (e.g. infants from low socio economic families and institutionalized elderly).

B. **Non- plaque induced gingival lesions**:

The origin of gingival inflammation in this group is different from that of the routine plaque-associated gingivitis. It is not caused by plaque and usually does not disappear after plaque removal.

1. **gingival diseases of specific bacterial origin**:
2. Neisseria gonorrhea-associated lesions
3. Treponema pallidum-associated lesions
4. Streptococcal species-associated lesions
5. Other

These conditions induced by exogenous bacterial infection other than common component of dental plaque.

1. **Gingival diseases of viral origin:**

These are acute manifestations of viral infections of oral mucosa, characterized by redness and multiple vesicles that easily rupture to form painful ulcers affecting the gingiva. These infections may be accompanied by fever, malaise, and regional lymphadenopathy.

1. Herpes virus infections:
2. Primary herpetic gingivostomatitisI
3. Recurrent oral herpes
4. Oral Epstein- Barr virus lesions
5. Varicella- Zoster infections
6. other

- Primary herpetic gingivostomatitis:-

It is a viral infection of oral mucous membrane caused by herpes simplex virus type 1 (HSV-1). It is mostly occur in children and characterized by painful severe gingivitis with ulcerations and edema. A characteristic feature is the formation of vesicles which rupture, coalesce and leave fibrin-coated ulcers. The patient has fever and lymphadenopathy, the lesion will remain 7-14 days, and recurrence is rare.

1. Gingival diseases of fungal origin:

These gingival manifestation of fungal infections are characterized by white, red, or ulcerative lesions associated with several predisposing conditions.

1. Candida species infections:

Generalized gingival candidiasis

1. Linear gingival erythema
2. Histoplasmosis
3. Others

In the generalized gingival candidiasis, the most common species that causes this condition is candida albicans. In otherwise healthy individuals, oral candidiasis rarely manifests in the gingiva, but in immunocompromized patients like HIV-seropositive. Infection show erythema of the marginal gingiva and this condition is called linear gingival erythema which characterized by linear erythematous band limited to free gingiva and not respond to plaque removal.

1. **Gingival diseases of genetic origin:**
2. Hereditary gingival fibromatosis
3. Other

The hereditary gingival fibromatosis is genetically derived fibrotic gingival enlargement.

1. **Gingival manifestations of systemic conditions:**
2. Mucocutaneous disorders:
3. Lichen planus
4. Pemphigoid
5. Pemphigus vulgaris
6. Drug-induced Erythema multiforme
7. Lupus erythematosus
8. Other

These oral manifestations of disorders of the skin and mucous membrane present as erosions, vesicles, bullae, ulcers, and desquamative lesions. The lesions may be erythematous, white, or striated in appearance.

1. Allergic reactions :these are gingival manifestations of immediate or delayed hypersensitivity responses.
2. Dental restorative materials:
3. Mercury
4. Nickel
5. Acrylic
6. Other

The allergy that is occur called contact allergy and there is clinical manifestations on the oral mucosa after a period of 12-48 hours following contact with the allergen. The lesions that affect the gingiva resemble oral lichen planus or leukoplakia. They are reddish or whitish and sometimes ulcerated but these lesions resolve after removal of the material.

1. Reactions attributable to:
2. Tooth pastes/dentifrices
3. Mouth rinses/mouthwashes
4. Chewing gum additives
5. Foods and additives

**Tooth pastes and mouth washes**:-

Contact hypersensitivity has been reported to occur after the use of tooth pastes and mouth washes but it is a rare condition and the allergic reaction may be due to the flavoring additives as cinnamon which also present in chewing gum. The gingiva will appear fiery red edematous and the lesions resolve after cessation of using the allergen-containing agent.

Foods:-

Some patients may be hypersensitive to certain type of food as kiwi, peach, apple, peanuts and pumpkin seed, red pepper resulting in gingivitis that resolve after removal of the allergen.

1. **Traumatic lesions:**

These are self-inflicted (factitious), accidental, or iatrogenic injuries. They may be present as localized gingival recession, abrasions, ulceration, and burns. The lesions may be edematous, erythematous, or white in appearance. Lesions may exhibit combinations of several of these clinical features.

1. Chemical injury
2. Physical injury
3. Thermal injury

-**Traumatic lesions induced by chemicals**:

These traumatic lesions can be caused by local application of certain chemicals such as aspirin, cocaine, pyrophosphates, detergents (e.g., sodium lauryl sulfate), smokeless tobacco, betel nut, and bleaching agents.

-**Traumatic lesions caused by physical injury**:-

These traumatic lesions may be accidental or result from inappropriate oral hygiene procedures, inadequate dental restorations, poorly designed dental appliances, and orthodontic bands and devices.

-**Thermal trauma** may occur from burns to the oral mucosa involving the gingiva. Common causes are hot coffee, pizza and melted cheese, dental treatment involving improper Handling of hot impression material, hot wax --- etc.

1. **Foreign body reactions**:

These lesions may present as acute or chronic gingival inflammation associated with entrance of foreign bodies or materials into gingival connective tissue. The foreign bodies could be of dental material origin or self-inflicted injury as chewing on sticks. The lesions can exhibit suppuration and may be red or red/white in appearance.

1. **Not otherwise specified (NOS)**: This mean that there may be some forms of gingivitis that do not fit under other items discussed previously.