Lec. Dr. Raghad Fadhil

Classification of periodontitis:

In 1999 the periodontitis were classified in to:

I. Chronic periodontitis:

Chronic periodontitis can be characterized by extent and severity. Extent is the number of the sites involved and can be described as localized or generalized. As a general guide, extent can be characterized as localized if ≤30% of the sites are affected and generalized if >30% of the sites are affected. Severity can be described for the entire dentition or for individual teeth and sites. As a general guide, severity can be categorized on the basis of the amount of clinical attachment loss (CAL) as follows:

Slight =1-2 mm CAL , moderate =3 - 4 mm CAL, and severe = ≥5 mm CAL.

The clinical features and characteristics of chronic periodontitis can be summarized as follows:

- Most prevalent in adults, but can occur in children and adolescents;
- Amount of destruction is consistent with the presence of local factors;
- Subgingival calculus is a frequent finding;
- Associated with variable microbial pattern;
- Slow to moderate rate of progression, but may have periods of rapid progression;
- Can be associated with local predisposing factors (e.g. tooth-related or iatrogenic factors);
- May be modified by and/or associated with systemic diseases (e.g. , diabetes mellitus)
- Can be modified by factors other than systemic diseases such as cigarette smoking and emotional stress.

II. Aggressive periodontitis: (A.P.)

A. Localized (confined to molars and incisors)

B. Generalized

The term aggressive periodontitis replaced the previous name early-onset periodontitis (prepubertal, juvenile periodontitis & rapidly progressive periodontitis).

The common features of localized and generalized forms of aggressive periodontitis:

- Except for the presence of periodontitis, patients are otherwise clinically healthy;
- Rapid attachment loss and bone destruction;
- Familial aggregation;
- Amounts of microbial deposits are inconsistent with the severity of periodontal tissue destruction;
- Elevated proportion of *aggregatibacter actinomycetemcomitans* and, in some populations, *porphyromonas gingivalis*, may be elevated;
- Phagocyte abnormalities
- Progression of attachment loss and bone loss may be self-arresting.

Recently, based on pathophysiology, three clearly different forms of periodontitis have been identified according to new classification system proposed by the American Academy of Periodontology (AAP) and the European Federation of Periodontology (EFP) in 2017:

1. Periodontitis.

2. Periodontitis as a direct manifestation of systemic diseases

3. Necrotizing periodontitis

I. Periodontitis: was classified according to different form of staging and grading. Staging relies on the standard dimensions of severity and extent of periodontitis at presentation.

The extent and distribution for each stage described as as molar/ incisor pattern or localized if the involved sites < 30% or generalized if the involved site ≥30%

Periodontitis groups are defined as (Tonetti et al., 2018):(1) Interdental CAL is detectable at ≥2 non-adjacent teeth, or (2) Buccal or oral CAL ≥3 mm with pocketing >3mm is detectable at ≥ 2teeth

Staging:

Stage I periodontitis: Stage I periodontitis is the borderland between gingivitis and periodontitis and represents the early stages of attachment loss, the severity of this stage associated with clinical attachment loss about 1-2mm and radiographic bone loss less than 15% in the coronal third, however, no tooth loss due to periodontitis associated with this stage .

Stage II periodontitis: represents established periodontitis. The severity of this stage associated with clinical attachment loss about 3-4mm and radiographic bone loss more than 15% and less than 33%in the coronal third.

Stage III periodontitis: This stage associated with clinical attachment loss ≥5mm and radiographic bone loss extending to the middle third of the roots.

Advanced stage IV periodontitis: This stage is characterized by the presence of deep periodontal lesions that extend to the apical portion of the root and/or history of multiple tooth loss. This stage associated with clinical attachment loss ≥5mm and radiographic bone loss extending to apical third of the roots.

Grades of periodontitis:

Irrespective of the stage at diagnosis, periodontitis may progress with different rates in individuals, may respond less predictably to treatment in some patients, and may or may not influence general health or systemic disease. Grading or rate of progression can be estimated by measurement of percentage of radiographical bone loss divided by the age of patient

Grade A periodontitis: is assigned if the maximum amount of radiographic bone loss in percentage terms is less than half the patient's age in years (for example, less than 30% in a 60-year-old or less than 40% in an 80-year-old)

Grade C periodontitis: is assigned if the maximum amount of bone loss in percentage terms exceeds the patient's age in years (for example, more than 30% in a 28-year-old or more than 50% in a 49-year-old)

Grade B periodontitis: all other situations

II. Periodontitis as a manifestation of systemic diseases :

A variety of systemic diseases and conditions can affect the course of periodontitis or have a negative impact on the periodontal attachment apparatus.

1. Systemic disorders that have a major impact on the loss of periodontal tissues by influencing periodontal inflammation

I. Genetic disorders

a. Diseases associated with immunologic disorders: like Down syndrome, Leukocyte adhesion deficiency syndromes, Papillon-Lefèvre syndrome

b. Diseases affecting the oral mucosa and gingival tissue: like Plasminogen deficiency

c. Diseases affecting the connective tissues: Ehlers-Danlos syndromes (types IV, VIII)

d. Metabolic and endocrine disorders: like Glycogen storage disease and Hypophosphatasia

II. Acquired immunodeficiency diseases : including Acquired neutropenia and HIV infection

III. Inflammatory diseases : Inflammatory bowel disease

2. Other systemic disorders that influence the pathogenesis of periodontal diseases

Diabetes mellitus ,Obesity ,Osteoporosis ,Arthritis (rheumatoid arthritis, osteoarthritis), Emotional stress and depression , Smoking (nicotine dependence)

3. Systemic disorders that can result in loss of periodontal tissues independent of periodontitis

a. Neoplasms:

-Primary neoplastic diseases of the periodontal tissues like Oral squamous cell carcinoma

-Secondary metastatic neoplasms of the periodontal tissues

b. Other disorders that may affect the periodontal tissues like Langerhans cell histiocytosis, Giant cell granulomas Hyperparathyroidism

III. Necrotizing periodontal diseases:

A. Necrotizing ulcerative gingivitis

B. Necrotizing ulcerative periodontitis

C. Necrotizing stomatitis

Necrotizing ulcerative gingivitis: This is an infection characterized by gingival necrosis presenting as 'punched-out' papillae, with gingival bleeding, and pain. Fetid breath and pseudomembrane formation may be secondary diagnostic features. *Fusiform bacteria*, *prevotella intermedia*, and *spirochetes* have been associated with gingival lesions. Predisposing factors may include: emotional stress, poor diet, cigarette smoking, and HIV infection.

Necrotizing ulcerative periodontitis: This is an infection characterized by necrosis of gingival tissues, periodontal ligament, and alveolar bone. These lesions are most commonly observed in individual with systemic conditions including HIV infection, severe malnutrition, and immunosuppression.

Necrotizing stomatitis : is a very severe and aggressive form of necrotizing periodontal disease showing extensive oral cavity tissue and bone destruction. In necrotizing stomatitis, after the oral mucosal membranes are destroyed, the entire mouth is involved due to spread of deep infection.

Other condition affecting the periodontium:

a. Periodontal abcesses and endodontic periodontal lesion

Periodontal abscesses (PA) :

Periodontal abscesses represented approximately 7.7–14.0% of all dental emergencies, being ranked the third most prevalent infection demanding emergency treatment, after dentoalveolar abscesses and pericoronitis.

I. Periodontal abscess in periodontitis patients In periodontitis patients, a PA could represent a period of disease exacerbation, favored by the existence of tortuous pockets, presence of furcation involvement or a vertical defect, in which the marginal closure of the pocket could lead to an extension of the infection into the surrounding periodontal tissues. In addition, changes in the composition of the subgingival microbiota, with an increase in bacterial

virulence, or a decrease in the host defense, could also result in an inefficient capacity to drain the increased suppuration. Different subgroups could be distinguished

a. Acute exacerbation:

○ In untreated periodontitis.

○ In “refractory” periodontitis.

b. After different treatments:

○ Scaling and root planing or professional prophylaxis

○Surgical periodontal therapy

○Systemic antimicrobial intake, without subgingival debridement

○Use of other drugs: e.g., nifedipine.

II. Periodontal abscess in non- periodontitis patients

(previously called gingival abscess), PA can also occur in previously healthy sites because of

• Impaction of foreign bodies: dental floss, orthodontic elastic, toothpick, rubber dam, or popcorn hulls.

• Harmful habits (biting wire, nail biting, clenching) could favor abscess formation because of subgingival impaction of foreign bodies or to coronal closure of the pocket.

• Orthodontic factors, such as inadequate orthodontic forces or a cross-bite, have been reported to favor PA development.

• Gingival enlargement.

• Alterations of the root surface, including:

○ Severe anatomic alterations, such as invaginated tooth, dens evaginatus (grooves) or odontodysplasia.

○ Minor anatomic alterations, such as cemental tears, enamel pearls or developmental grooves.

○ Iatrogenic conditions, such as perforations.

○ Severe root damage: vertical root fracture or cracked tooth syndrome

extending through the root.

○ External root resorption.

PA may be associated with various combinations of the following clinical features: Pain, swelling, color change, tooth mobility, extrusion of teeth, purulence, sinus tract formation, fever, lymphadenopathy, and there may be a radiolucency of the affected alveolar bone.

The acute periodontal abscess characterized by slight discomfort to severe pain and swelling. Chronic periodontal abscess is usually a symptomatic or with dull pain with a history of intermittent exudate.

The periodontal abscess need to be differentiated from the periapical abscess in the followings:

Periodontal abscess		Periapical abscess
1.	The tooth is vital.	Tooth is not vital.
2.	The lesion lateral to the root surface.	The lesion is most likely periapical.
3.	X-ray finding shows area of radiolucency along the lateral surface of the root.	X-ray finding shows apical radiolucency.
4.	The tooth is tender to lateral percussion.	Tooth tender to vertical percussion.

Endodontic periodontal lesions:

Are clinical conditions involving both the pulp and periodontal tissues and may occur in acute or chronic forms. When they are associated with a recent traumatic or iatrogenic event (e.g. root fracture or perforation), the most common manifestation is an abscess accompanied by pain. However, endo-

periodontal lesions, in subjects with periodontitis, normally present slow and chronic progression without evident symptoms. The most common signs and symptoms associated with a tooth affected by an endo-periodontal lesions are deep periodontal pockets reaching or close to the apex and negative or altered response to pulp vitality tests. The other signs and symptoms reported, in order of prevalence, are: bone resorption in the apical or furcation region, spontaneous pain or pain on palpation and percussion, purulent exudate, tooth mobility, sinus tract, crown, and gingival color alterations

1. Endo-periodontal lesions associated with endodontic and periodontal infections They might be triggered:

(1) by a carious lesion that affects the pulp and, secondarily, affects the periodontium.

(2) by periodontal destruction that secondarily affects the root canal.

(3) or by both events concomitantly.

2. Endo-periodontal lesions associated with trauma and iatrogenic factors

These conditions usually have a poor prognosis as they affect the tooth structure. The most common lesions in this category were:

(1) root/pulp chamber/furcation perforation (e.g. because of root canal instrumentation or to tooth preparation for post retained restorations)

(2) root fracture or cracking (e.g., because of trauma or tooth preparation for post-retained restorations)

(3) external root resorption (e.g., because of trauma)

(4) pulp necrosis (e.g., because of trauma) draining through the periodontium.

b. Mucogingival deformities or conditions around teeth:

1. gingival biotype
    a. Thin scalloped
    b. Thick scalloped
    c. Thick flat

2. Gingival/soft tissue recession
    a. Facial or lingual surfaces
    b. Interproximal (papillary)
    c. Severity of recession
    d. Gingival thickness
    e. Gingival width
3. Lack of keratinized gingiva
4. Decreased vestibular depth
5. Aberrant frenum/muscle position
6. Gingival excess
    a. Pseudopocket
    b. Inconsistent gingival margin
    c. Excessive gingival display
    d. Gingival enlargement
7. Abnormal color

Mucogingival: Term used to describe that portion of the oral mucosa that covers the alveolar process including the gingiva (keratinized tissue) and the adjacent alveolar mucosa.

Gingival biotype, which includes in its definition gingival thickness (GT) and keratinized tissue width (KTW);. A recent systematic review using the parameters reported previously, classified the “biotypes” in three categories:

• Thin scalloped biotype in which there is a greater association with slender triangular crown, subtle cervical convexity, interproximal contacts close to the incisal edge and a narrow zone of KT, clear thin delicate gingiva, and a relatively thin alveolar bone.

• Thick flat biotype showing more square-shaped tooth crowns, pronounced cervical convexity, large interproximal contact lo- cated more apically, a broad zone of KT, thick, fibrotic gingiva, and a comparatively thick alveolar bone.

• Thick scalloped biotype showing a thick fibrotic gingiva, slender teeth, narrow zone of KT, and a pronounced gingival scalloping.

Gingival recession: Is location of the gingival margin apical to the cemento-enamel junction.

The causes of gingival recession:

- Plaque accumulation will cause destruction of the junctional epithelia as a result of the inflammatory process.
- Traumatic gingival recession:
  - Fault tooth brushing
  - Tooth malposition
  - High frenal attachment
  - Overhanging fillings
  - Prosthetic appliances
  - Habits as nail biting.

c. <u>Tooth and prosthetic related factors</u> :

A. Localized tooth-related factors that modify or predispose to plaque-induced gingival diseases/periodontitis

1. Tooth anatomic factors
2. Root fractures
3. Cervical root resorption, cemental tears
4. Root proximity
5. Altered passive eruption

B. Localized dental prosthesis-related factors

1. Restoration margins placed within the supracrestal attached tissues
2. Clinical procedures related to the fabrication of indirect restorations
3. Hypersensitivity/toxicity reactions to dental materials.

Several conditions exist in teeth that may predispose the periodontium to disease. In certain cases these factors may contribute to the initiation of periodontal disease. While the etiology of periodontal disease is bacterial,

factors that enhance bacterial accumulation or allow ingress of bacteria into the periodontium should be considered in the classification of periodontal diseases.

d.Traumatic occlusal force

1. Primary occlusal trauma
2. Secondary occlusal trauma
3. Orthodontic force

Occlusal trauma: Injury resulting in tissue changes within the attachment apparatus as a result of occlusal force(s).

Primary occlusal trauma: Injury resulting in tissue changes from traumatic occlusal forces applied to tooth or teeth with normal support. It occurs in the presence of:

1) Normal bone levels, 2) Normal attachment levels, and 3) Excessive occlusal force(s).

Secondary occlusal trauma: Injury resulting in tissue changes from normal or traumatic occlusal forces applied to a tooth or teeth with reduced support. It occurs in the presence of:

1) Bone loss, 2) Attachment loss, And 3) "Normal"/excessive occlusal force(s).

e.Peri-implant diseases and conditions

1. peri-implant health

In health, the peri-implant site is characterized by absence of erythema, bleeding on probing, swelling and suppuration.

2. peri-implant mucositis: the diagnosis of peri-implant mucositis requires:

Visual inspection demonstrating the presence of periimplant signs of inflammation: red as opposed to pink, swollen tissues as opposed to no swelling. Presence of profuse bleeding and/or suppuration

on probing, an increase in probing depths compared to baseline; and absence of bone loss beyond crestal bone level changes resulting from the intial remodeling.

3. peri-implantitis: the diagnosis of peri-implantitis will involve radiographic bone loss associated with gingival recession or increased probing depth in addition to signs associated with peri-implant mucositis