

Periodontitis

Periodontitis is a chronic multifactorial inflammatory disease associated with plaque biofilms and characterized by progressive destruction of the tooth-supporting apparatus. Its **primary features** include the loss of periodontal tissue support, manifested through clinical attachment loss (CAL) and radiographic bone loss (RBL), presence of periodontal pocketing and gingival bleeding. Periodontitis is a major public health problem due to its high prevalence, as well as because it may lead to tooth loss and disability, negatively affect chewing function and aesthetics, and impair quality of life.

In 1999 the periodontitis were classified into:

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 $\leq 30\%$ 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,
- ✓ 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**
- ❖ **Can be associated with local predisposing factors (e.g. tooth-related or iatrogenic factors); or 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.**

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 *aggreatibacter 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 manifestation of systemic disease
3. Necrotizing periodontal diseases

1. Periodontitis: Classified according to different form of **staging and grading**.

☒ **Staging** aims to classify the severity and extent of a patient’s disease based on the measurable amount of damaged tissue as a result of periodontitis. Initial stage should be determined by using **clinical attachment loss (CAL)**. If CAL is not available, **radiographic bone loss (RBL)** should be used (**Table 3**). Tooth loss due to periodontitis may modify the stage . The extent and distribution for each stage described as molar/ incisor pattern or localized if the involved sites < 30% or generalized if the involved site ≥30%.

Periodontitis		Stage I	Stage II	Stage III	Stage IV
Severity	Interdental CAL (at site of greatest loss)	1 – 2 mm	3 – 4 mm	≥5 mm	≥5 mm
	RBL	Coronal third (<15%)	Coronal third (15% - 33%)	Extending to middle third of root	Extending to apical third of root
	Tooth loss (due to periodontitis)	No tooth loss	No tooth loss	≤4 teeth	≥5 teeth
Extent and distribution	Add to each stage descriptor	For each stage, describe extent as: <input checked="" type="checkbox"/> Localized (<30% of teeth involved); <input checked="" type="checkbox"/> Generalized; or <input checked="" type="checkbox"/> Molar/incisor pattern			

☒ **Grading** aims to indicate the rate of periodontitis progression, responsiveness to standard therapy, and potential impact on systemic health. Grading or rate of progression can be estimated by measurement the percentage of radiographical bone loss divided by the age of patient (**% bone loss / patient's age**).

1. Grade A (slow): **<0.25**
2. Grade B (moderate): **0.25– 1.0**
3. Grade C (rapid): **>1.0**

(Grade is assessed on the worst affected tooth).

☒ **Distribution**

- Molar– incisor pattern (added in 2017 classification).
- Localized <30% of teeth.
- Generalized \geq 30% of teeth.

☒ **Assessment of current periodontal status**

Currently stable: BOP <10%, PPD <4mm, no BOP at 4mm sites.

Currently in remission: BOP >10%, PPD <4mm, no BOP at 4mm sites.

Currently unstable: PPD >5mm or PPD >4mm and BOP.

☒ **Risk factors**

- 1-Smoking.
- 2-Uncontrolled diabetes.

Example of a diagnosis statement

Generalized periodontitis stage III grade B currently unstable with smoking as a risk factor.

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

Classification of systemic diseases and conditions that affect the periodontal supporting tissues :-

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

1-Genetic disorders

1.1-Diseases associated with immunologic disorders:

- Down syndrome
- Leukocyte adhesion deficiency syndromes
- Papillon-Lefèvre syndrome
- Chediak-Higashi syndrome
- Severe neutropenia
- Primary immunodeficiency diseases
- Cohen syndrome

1.2 -Diseases affecting the oral mucosa and gingival tissue:

- Epidermolysis bullosa
- Plasminogen deficiency

1.3- Diseases affecting the connective tissues:

- Ehlers-Danlos syndromes (types IV, VIII)
- Systemic lupus erythematosus

1.4- Metabolic and endocrine disorders:

- Glycogen storage disease
- Hypophosphatasia

2-Acquired immunodeficiency diseases:

- Acquired neutropenia
- HIV infection

3- Inflammatory diseases:

- Inflammatory bowel disease

B. Systemic disorders that influence the pathogenesis of periodontal diseases :

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

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

1-Neoplasms

1.1-Primary neoplastic diseases of the periodontal tissues

- Oral squamous cell carcinoma
- Odontogenic tumors

1.2-Secondary metastatic neoplasms of the periodontal tissues

2-Other disorders that may affect the periodontal tissues

Langerhans cell histiocytosis

Hyperparathyroidism

Systemic sclerosis (scleroderma)

III. Necrotizing periodontal diseases:

A. Necrotizing gingivitis

B. Necrotizing periodontitis

C. Necrotizing stomatitis

Necrotizing 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 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 damage in the 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 infection.



Fig.:- Necrotizing gingivitis.

Other condition affecting the periodontium

a. Periodontal abscesses 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.

1. 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.

2. 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,**

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 aradiolucency of the affected alveolar bone.

The acute periodontal abscess characterized by slight discomfort to severe pain and swelling. Chronic periodontal abscess is usually asymptomatic 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. 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.

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.