Diagnosis of periodontal diseases

Proper diagnosis is essential to intelligent treatment. Periodontal diagnosis should first determine whether disease is present then identify its type, extent, duration, distribution and severity.
Periodontal diagnosis is determined after careful analysis of the case history and evaluation the clinical signs and symptoms, as well as the result of various tests (probing, mobility assessment, radiographs, blood test, and biopsies).
The following is a recommended sequence of procedures for the diagnosis of periodontal diseases.

History

Medical History:

The importance of the medical history should be explained to the patients because patients omit information that they cannot relate to their dental problems. The patient should be made aware of:
1. The presence of conditions that may require special precautions or modifications in treatment procedure.
2. The possible role that some systemic diseases, conditions, may play in the cause of periodontal disease
3. The possibility that oral infections may have a powerful influence on the occurrence and severity of certain systemic disease

The Medical history should include the following:

• Is the patient under the care of a physician, and if so what is the problem? Its duration and nature.

Details on hospitalization and operation including diagnosis, kind of operation, and complications.
• Medical problem hematologic, endocrine, infectious, cardiovascular

• The medications taking with special inquiry should be made regarding the dosage and duration of therapy with anticoagulant and corticosteroids.
• History of allergy recorded like fever, asthma, sensitivity to food.
• Family medical history including bleeding disorders and diabetes or others.
• Abnormal bleeding tendencies such as nose bleeding, abnormal ecchymosis, prolonged bleeding from minor cut and excessive menstrual bleeding.

Dental History

some patients may be unaware of any problem but many may report bleeding gum; loose of teeth; spreading of the teeth with the appearance of spaces where none existed before, foul test in the mouth.
Sensitivity when chewing, sensitivity to cold &hot, and extreme sensitivity to inhaled air.

The Dental History should include the following:

• A list of visit to the dentist, frequency, date of the last visit, nature of treatment and cleaning by a dentist.
• The patient's oral hygiene regimen including tooth brushing (frequency, method, type of tooth brush and dentifrices) mouth wash, interdental brush, water irrigation and dental floss.
• Any orthodontic treatment, duration & termination date.
• Pain in the teeth or in the gingiva (nature, duration& how its relieved)
• Gingival bleeding (spontaneously , on brushing or eating)
• A bad test in the mouth.

• The patient's general dental habits such as grinding or clenching of the teeth during the day or at night.

• History of previous periodontal problems, including the nature of the condition and if previously treated, the type of treatment received (surgical or nonsurgical) and approximate period of termination of previous treatment
• if the patient wear any removable prosthesis.

Intraoral Radiographic Survey

The radiographic survey should consist of a minimum of 14 intraoral films and four posterior bite-wing films. Panoramic radiographs are a simple and convenient method of obtaining a survey view of the dental arch and surrounding structures.
They are helpful for the detection of developmental anomalies, pathologic lesions of the teeth and jaws, and fractures as well as dental screening examinations of large groups. They provide an informative overall radiographic picture of the distribution and severity of bone destruction in periodontal disease.
Radiographic image tend to underestimate the severity of bone loss .

Casts

Casts from dental impressions are useful adjuncts in the oral examination. They indicate
• The position of the gingival margins (recession)
• The position and inclination of the teeth
• Proximal contact relationships, and food impaction areas.
• They provide a view of the lingual-cuspal relationships.

Casts are important records of the dentition before it is altered by treatment. Finally, casts also serve as visual aids in discussions with the patient and are useful for pretreatment and post treatment comparisons, as well as for reference at recall visits.

Clinical Photographs

Color photographs are useful for recording the appearance of the tissue before and after treatment.

Oral Examination

Oral Hygiene

The extent of accumulated food debris, plaque, and tooth surface stains. Disclosing solution may be used to detect plaque that would otherwise be unnoticed. The amount of plaque detected, however, is not necessarily related to the severity of the disease present. For example, aggressive periodontitis is a destructive type of periodontitis in which plaque is minimal.

Plaque Index:

which was introduced by Silness and Loe in 1964

- **0** No plaque
- **1** A film of plaque adhering to the free gingival margin and adjacent area of the tooth, which can not be seen with the naked eye. But only by using disclosing solution or by using probe.
- **2** Moderate accumulation of deposits within the gingival pocket, on the gingival margin and/ or adjacent tooth surface, which can be seen with the naked eye.
- **3** Abundance of soft matter within the gingival pocket and/or on the tooth and gingival margin.

Examination of the Teeth

- The teeth are examined for caries, poor restorations, developmental defects, anomalies of tooth form, wasting, hypersensitivity, and proximal contact relationships.

Wasting Disease of the Teeth

Wasting is defined as any gradual loss of tooth substance characterized by the formation of smooth, polished surfaces.

- **Erosion:**

- also called corrosion, is a sharply defined wedge-shaped depression in the cervical area of the facial tooth surface

• .The surfaces are smooth, hard, and polished. Erosion generally affects a group of teeth.
• In the early stages, it may be confined to the enamel, but it generally extends to involve the underlying dentin, as well as the cementum.
• The etiology of erosion is not known. Decalcification by acidic beverages, or citrus fruits, combined with the effect of acid salivary secretion are suggested causes.

• Abrasion :

• Rrefers to the loss of tooth substance induced by mechanical wear other than that of mastication.
• Abrasion results in saucer-shaped or wedge shaped indentations with a smooth, shiny surface.
• Abrasion starts on exposed cementum surfaces rather than on the enamel and extends to involve the dentin of the root. A sharp "ditching" around the cemento-enamel junction appears to be the result of the softer cemental surface, as compared with the much harder enamel surface.
Tooth brushing with an abrasive dentifrice, Aggressive tooth brushing and hard tooth brush are the most common causes.
Horizontal brushing at right angles to the vertical axis of the teeth results in the severest loss of tooth substance.

Attrition:

• Is occlusal wear resulting from functional contacts with opposing teeth .
Such physical wear patterns may occur on incisal, occlusal, and approximal tooth surfaces.
• Occlusal or incisal surfaces worn by attrition are called facets.

. Facets are usually not sensitive to thermal or tactile stimulation.
The angle of the facet on the tooth surface is potentially significant to the periodontium. Horizontal facets tend to direct forces on the vertical axis of the tooth, to which the periodontium can adapt most effectively. Angular facets direct occlusal forces laterally and increase the risk of periodontal damage.

Examination of Lymph Nodes

1. Lymph nodes can become enlarged and/or indurated as a result of an infectious episode, malignant metastases, periodontal, periapical, other oral diseases or residual fibrotic changes.
2. Inflammatory nodes become enlarged, palpable, tender, and fairly immobile. The overlying skin may be red and warm.

Examination of the Periodontium

The periodontal examination should be systematic, starting in the molar region in either the maxilla or the mandible and proceeding around the arch.

Gingiva

The gingiva is the keratinized mucosa that surrounds the teeth.

Color changes in the gingiva.

The normal gingival color is ―coral pink. Gingiva becomes redder when there is an increase in vascularization or the degree of epithelial keratinization becomes reduced or disappears.

Changes in the size of the gingiva.

In disease, the size is increased, which can be termed as gingival enlargement. The factors responsible for this are increase in fibers and decrease in cells as in the non-inflammatory type. Whereas in the inflammatory type there will be increase in cells and decrease in fibers

Changes in the consistency of the gingiva.

Both chronic and acute inflammations produce changes in the normal firm, resilient consistency of the gingiva. In chronic gingival inflammation both destructive (edematous) and reparative (fibrotic) changes coexist, and the consistency of the gingiva is determined by their relative predominance

Gingival Index (GI) (Loe, 1967)

measures the degree of gingival inflammation. Tissues surrounding each tooth divided into 4 gingival scoring units: distal facial papilla, facial margin, mesial facial papilla, lingual gingival margin.

Score 0 Normal gingiva
Score 1 Mild inflammation — slight change in color, slight edema. No bleeding on probing
Score 2 Moderate inflammation — redness, edema and glazing. Bleeding on probing
Score 3 Severe inflammation — marked redness and edema. Ulceration. Tendency to spontaneous bleeding

The GI may be used for the assessment of prevalence and severity of gingivitis in populations, groups and individuals.

Gingival bleeding.

Gingival bleeding varies in severity, duration and the ease with which it is provoked. Bleeding on probing is easily detectable clinically and therefore is of great value for the early diagnosis and prevention of more advanced gingival inflammation. Gingival bleeding on probing is one of the earliest visual signs of inflammation. It can appear earlier than color changes or any other visual signs of inflammation. It also provides an additional advantage, by being a more objective sign that requires less subjective estimation by the examiner.

Bleeding on probing (BOP).

A periodontal probe is inserted to the ―bottom of the gingival/periodontal pocket by applying light force and is moved gently along the tooth (root) surface.

Gingival sulcus & periodontal pocket

Gingival sulcus.

The sulcus depth usually remains at 1–3 mm irrespective of the level of clinical attachment. ―Pseudopockets may be present in cases of slightly increased probing depth without concomitant attachment and alveolar bone loss and presence/absence of bleeding on probing

Periodontal Pockets

Examination for periodontal pockets must include their presence and distribution on each tooth surface, pocket depth, level of attachment on the root, and type of pocket (suprabony or infrabony).

Signs and Symptoms

Although probing is the only reliable method of detecting pockets, clinical signs, such as color changes (bluish red marginal gingiva or bluish red vertical zone extending from the gingival margin to the attached gingiva); a “rolled” edge separating the gingival margin from the tooth surface; or an

enlarged, edematous gingiva, may suggest their presence. The presence of bleeding, suppuration, and loose, extruded teeth may also denote the presence of a pocket
Periodontal pockets are generally painless but may give rise to symptoms such as localized or sometimes radiating pain or sensation of pressure after eating, which gradually diminishes.

Detection of Pockets

The only accurate method of detecting and measuring periodontal pockets is careful exploration with a periodontal probe. Pockets are not detected by radiographic examination. The periodontal pocket is a soft tissue change. Radiographs indicate areas of bone loss in which pockets may be suspected, but they do not show pocket presence or depth

probing pocket depth (PPD):

The probing depth is the distance from the gingival margin to the bottom of the gingival sulcus/pocket . it is measured to the nearest millimetre by means of a graduated periodontal probe.
The probe should be inserted parallel to the vertical axis of the tooth and "walked" circumferentially around each surface of each tooth to detect the areas of deepest penetration .

Clinical Attachment Level (CAL):

It is the distance between the base of the pocket and a fixed point on the crown such as the cementoenamel junction (CEJ). Changes in the level of attachment can be the result of gain or loss of attachment and afford a better indication of the degree of periodontal destruction or gain

CAL is more reliable than PPD in describing attachement loss and periodontal diseases.