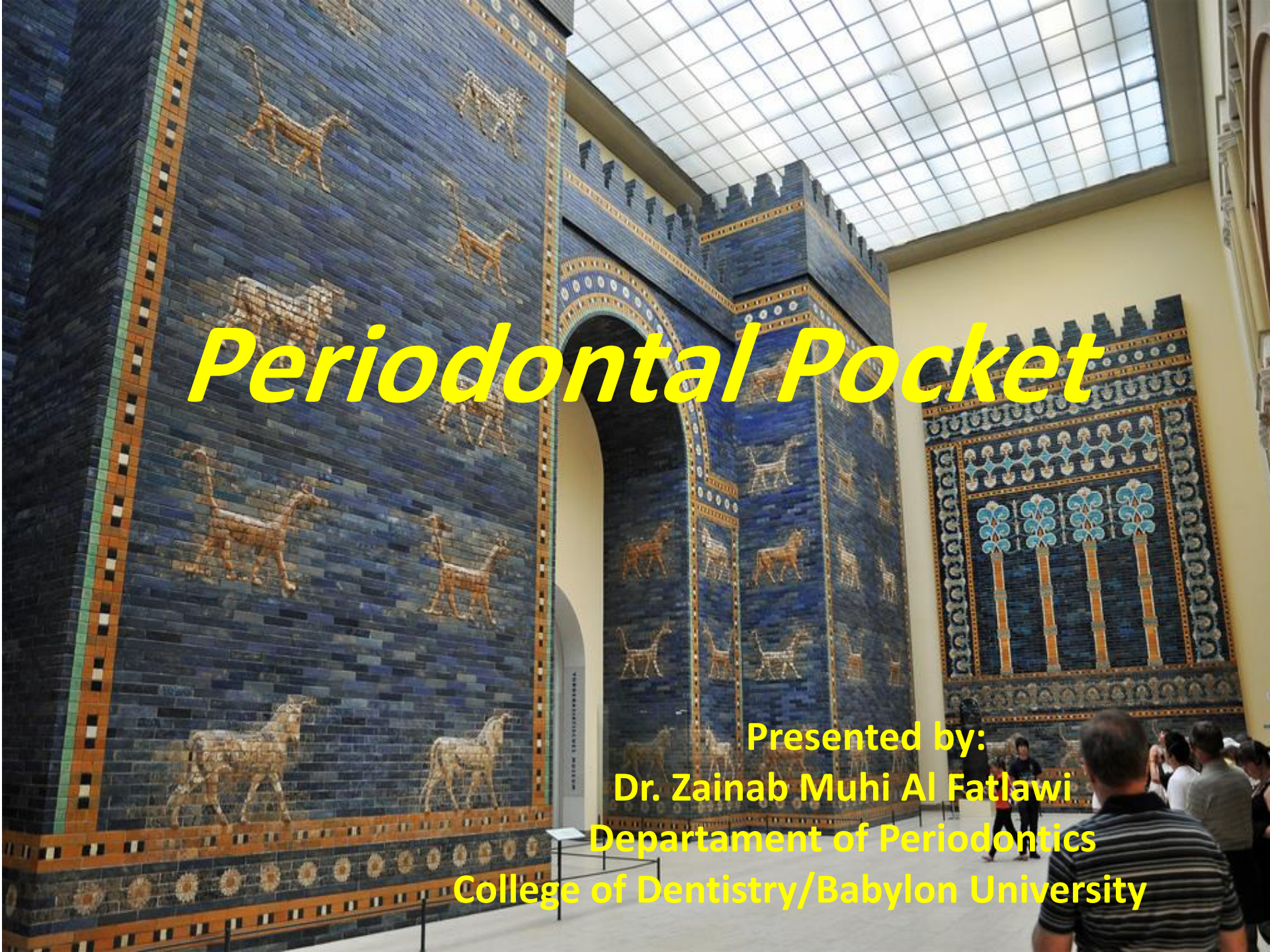

Periodontal Pocket

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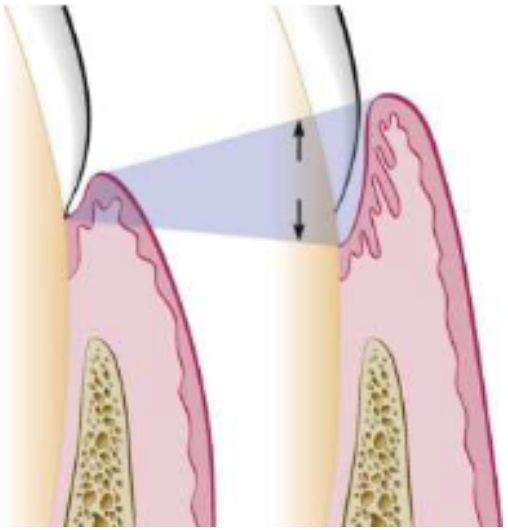
Periodontal pocket

The periodontal pocket, which is defined as a pathologically deepened gingival sulcus, is one of the most important clinical features of periodontal disease.

Classification

Deepening of gingival sulcus may occur by: -

1. **Coronal movement of gingival margin**
2. **Apical displacement of the gingival attachment**
3. **A combination the two process**



Pockets can be classified as follows :

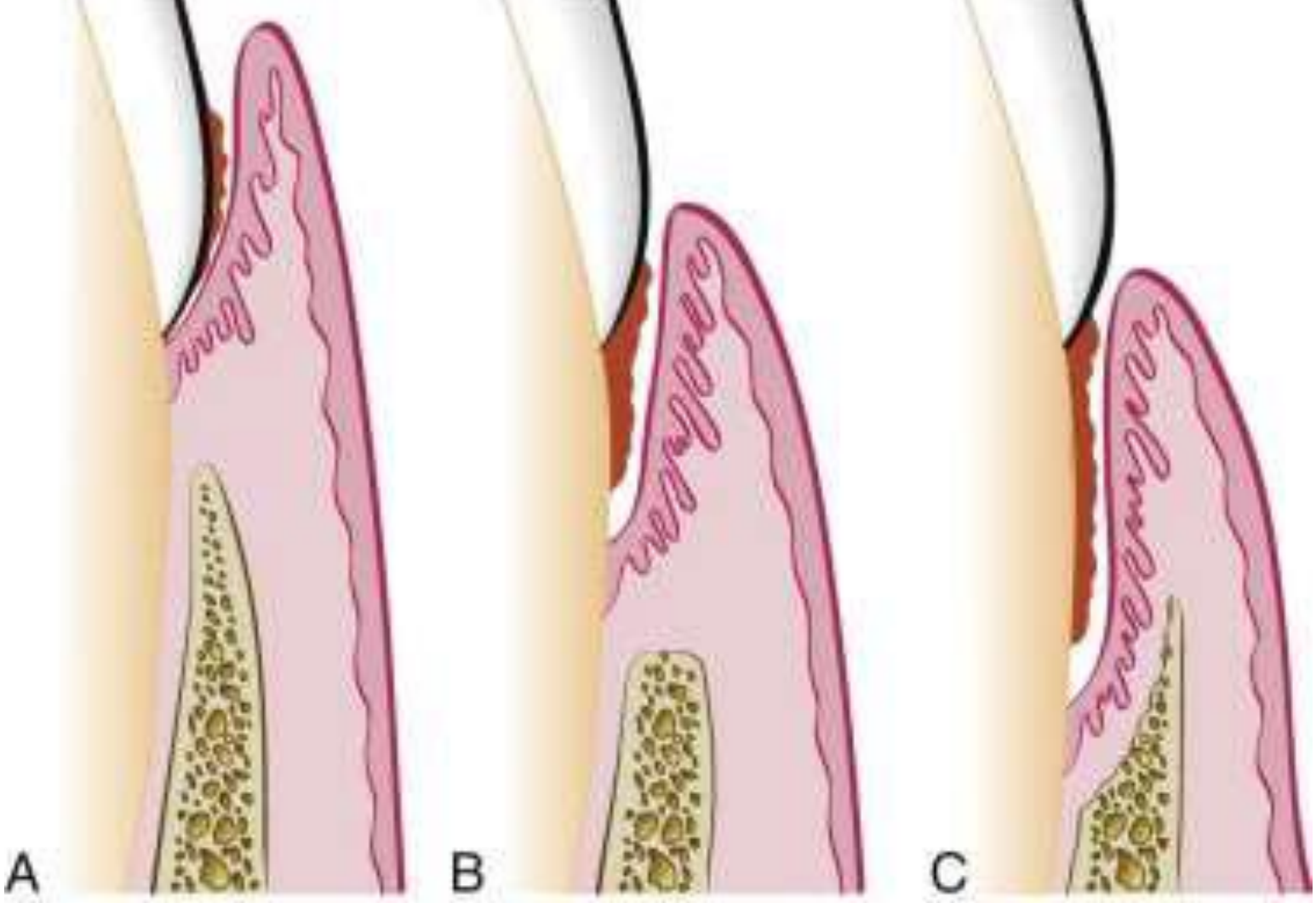
1. **Gingival Pocket (Pseudopocket) – formed by gingival enlargement without destruction of the underlying tissues. The sulcus is deepened because of the increased bulk of the gingiva.**

2. Periodontal Pockets – it occurs with destruction of supporting periodontal tissues.

Two types of periodontal pockets exist :

I. Suprabony (Supracrestal or Supraalveolar) - In this,bottom of the pocket is coronal to the underlying alveolar bone.

II. Intrabony (Infrabony, Subcrestal or intraalveolar) – In this, bottom of the pocket is apical to the level of the adjacent alveolar bone and the lateral pocket wall lies between the tooth surface & alveolar bone.



A. Gingival Pocket

B. Suprabony

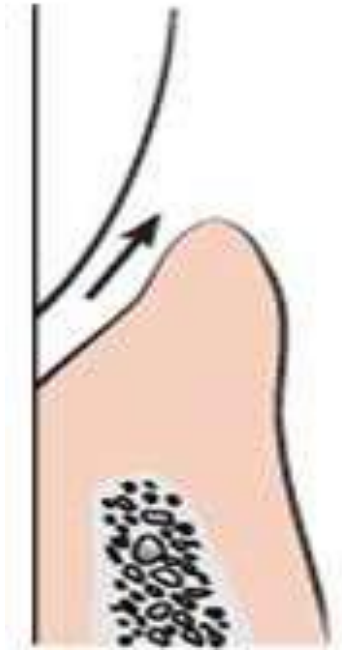
C. Intrabony Pocket

Periodontal pockets can also be classified-

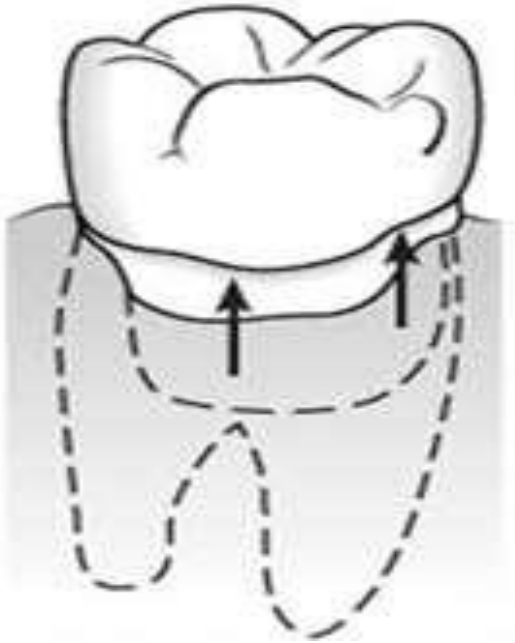
[A] According to involved tooth surface

1. Simple 2. Compound 3. Complex or Spiral

Complex or Spiral – originating on one surface and twisting around the tooth to involve one or more additional surfaces (most commonly found in furcation area)



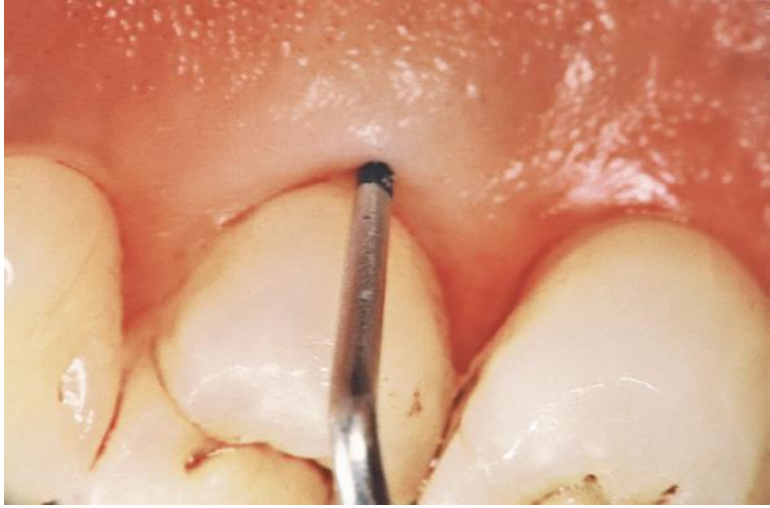
Simple



Compound

Complex

Clinical Features



1. The gingival wall of the pocket presents various degrees of bluish-red discoloration; flaccidity; a smooth, shiny surface; and pitting on pressure

2. Less frequently, the gingival wall may be pink and firm.

3. Bleeding is elicited by gently probing the soft-tissue wall of pocket.

4. When explored with a probe, the inner aspect of the pocket is generally painful.

5. In many cases, pus may be expressed with the application of digital pressure.

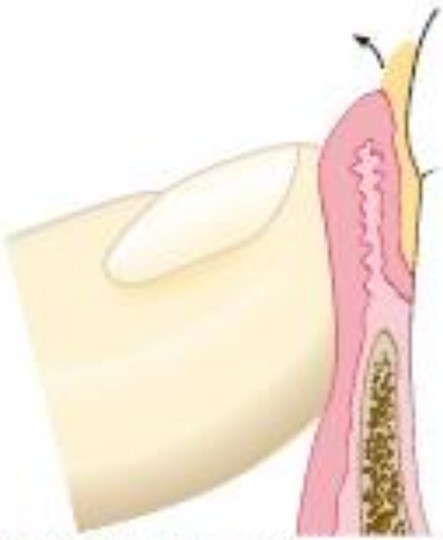


Figure 29-24 Purulent exudate expressed from a periodontal pocket by digital pressure.

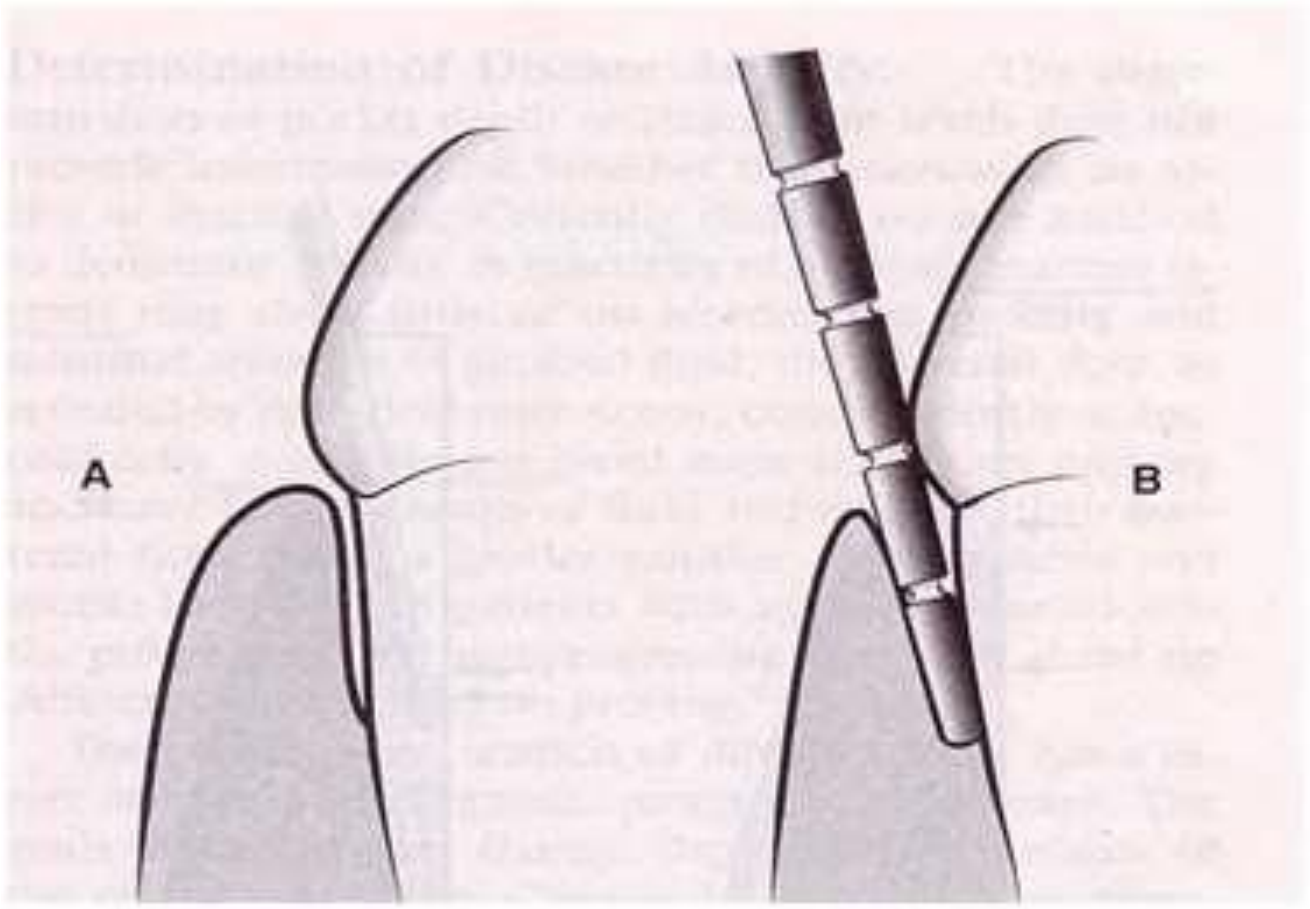
Pocket depth

The only reliable method of locating periodontal pockets and determining their extent is careful probing along each tooth surface.

There are two different pocket depths –

Biologic or Histologic depth :- is the distance between the gingival margin and the base of the pocket (the coronal end of the junctional epithelium.

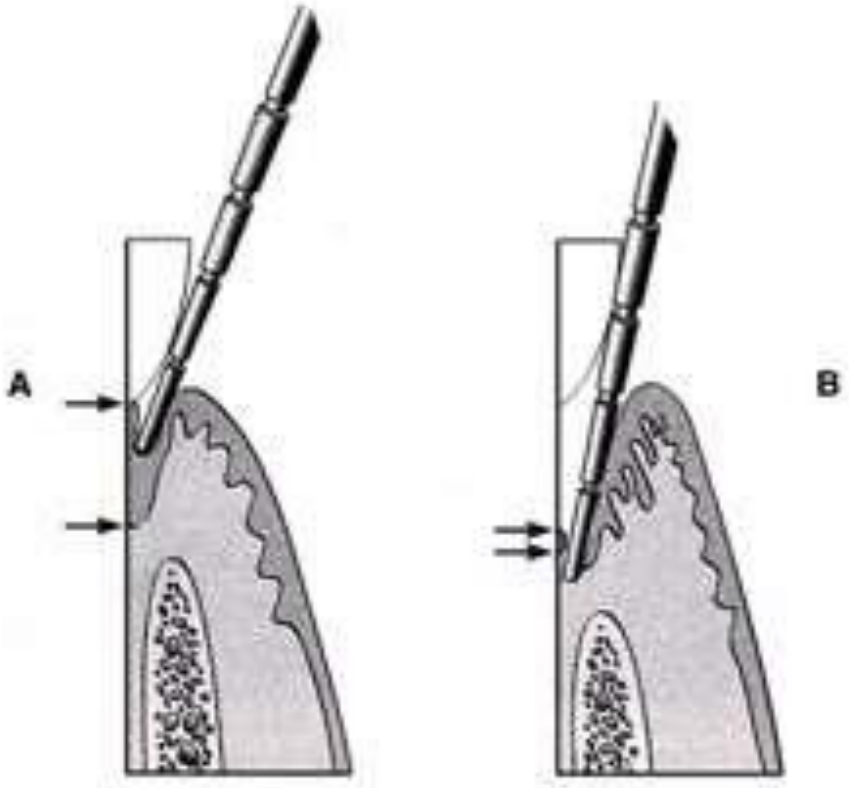
Clinical or probing depth :- Is the distance from the gingival margin to which a probe penetrates in to the pocket.



<u>According to several investigators - The probing force of 0.75 N or 30 gm have been found to be well tolerated and accurate.</u>

In normal sulcus, the probe penetrates about one third to one half the length of junctional epithelium

In periodontal pocket with a short junctional epithelium the probe penetrates beyond the apical end of junctional epithelium.



Pathogenesis

The initial lesion in the development of periodontitis is the inflammation of the gingiva in response to a bacterial challenge.

Changes involved in the transition from the normal gingival sulcus to the pathologic periodontal pocket are associated with different proportions of bacterial cells in dental plaque.

Healthy gingiva is associated with few microorganisms, mostly coccoid cells and straight rods.

Diseased gingiva is associated with increased numbers of spirochetes and motile rods.

However, the microbiota of diseased sites cannot be used as a predictor of future attachment or bone loss,

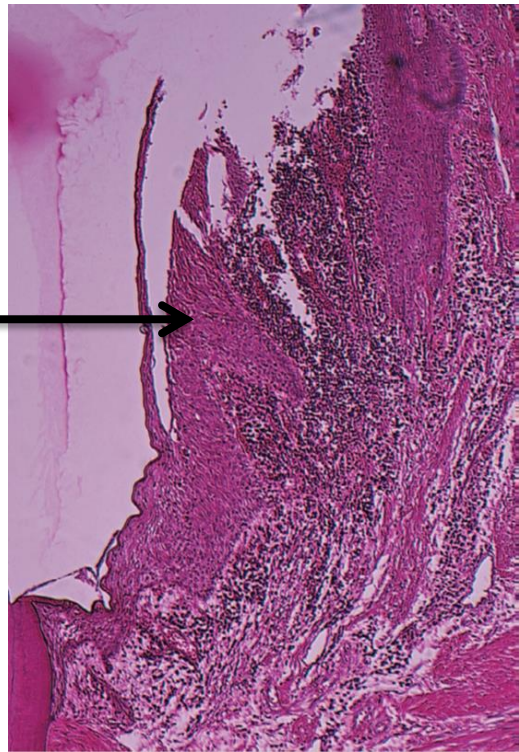
because their presence alone is not sufficient for disease to start or progress.

Extension of the junctional epithelium along the root requires the presence of healthy epithelial cells.

Marked degeneration or necrosis of the junctional epithelium impairs rather than accelerates pocket formation.

(This occurs in necrotizing ulcerative gingivitis,which results in an ulcer rather than pocket formation.)

Degenerative changes seen in the junctional epithelium at the base of periodontal pockets are usually *less severe* than those in the epithelium of the lateral pocket wall



View of the ulcerated lateral pocket wall of a periodontal pocket. Note the extension of epithelial cells and the dense accumulation of leukocytes within the epithelium and in the connective tissue.

Bacterial Invasion

Bacterial invasion of the apical and lateral areas of the pocket wall has been described in human chronic periodontitis.

Filaments, rods, and coccoid organisms with predominant gram-negative cell walls have been found in intercellular spaces of the epithelium.

Porphyromonas gingivalis

Prevotella intermedia.

Actinobacillus actinomycetemcomitans has also been found in the tissues in the gingiva of aggressive periodontitis cases

The two mechanisms associated with collagen loss are as follows:

(1)collagenases and other enzymes secreted by various cells in healthy and inflamed tissue, such as fibroblasts,PMNs, and macrophages Ex.MMP

(2) Fibroblasts phagocytize collagen fibers by extending cytoplasmic processes to the

ligament–cementum interface and degrading the inserted collagen fibrils and the fibrils of the cementum matrix

Mechanisms of Tissue Destruction

The inflammatory response triggered by bacterial plaque unleashes a complex cascade of events aimed at destroying and removing bacteria, necrotic cells, and deleterious agents.

The host's cells (e.g., neutrophils, macrophages, fibroblasts, epithelial cells) produce:-

proteinases, cytokines, and prostaglandins

that can damage or destroy the tissues.

Periodontal Pockets as Healing Lesions

Periodontal pockets are chronic inflammatory lesions and thus are constantly undergoing repair.

Complete healing does not occur because of the persistence of the bacterial attack, which continues to stimulate an inflammatory response, thereby causing degeneration of the new tissue elements formed during the continuous effort at repair.

Pocket Contents

Periodontal pockets contain debris that consists principally of

1- microorganisms and their products (enzymes, endotoxins, and other metabolic products),

2-gingival fluid,

3-food remnants,

4- salivary mucin,

5- desquamated epithelial cells, and

6-leukocytes.

Plaque covered calculus usually projects from the tooth surface.

Pus is a common feature of periodontal disease, but it is only a secondary sign.

The presence of pus or the ease with which it can be expressed from the pocket merely reflects the nature of the inflammatory changes in the pocket wall.

It is not an indication of the depth of the pocket or the severity of the destruction of the supporting tissues.

Extensive pus formation may occur in shallow pockets, whereas deep pockets may exhibit little or no pus.

The localized accumulation of pus constitutes an abscess

Root Surface Walls

As the pocket deepens, collagen fibers embedded in the cementum are destroyed, and cementum becomes exposed to the oral environment.

Collagenous remnants of Sharpey fibers in the cementum undergo degeneration, thereby creating an environment favorable to the penetration of bacteria. Viable bacteria have been found in the roots of 87% of periodontally diseased noncarious teeth.

Bacterial penetration into the cementum can be found as deep as the cementodentinal junction,and it may also enter the dentinal tubules.

Penetration and the growth of bacteria leads to fragmentation and breakdown of the cementum surface and results in areas of necrotic cementum that are separated from the tooth by masses of bacteria.

These changes manifest clinically as softening of the cementum surface; this is usually asymptomatic, but it can be painful when a probe or explorer penetrates the area.

They also constitute a possible reservoir for reinfection of the area after treatment.

***** **During the course of treatment, these necrotic areas are removed by root planing until a hard, smooth surface is reached.**

Cementum is very thin in the cervical areas, and scaling and root planing often remove it entirely, exposing the underlying dentin.

Sensitivity to cold may result until secondary dentin is formed by the pulp tissue.

Periodontal Disease Activity

According to this concept, periodontal pockets go through periods of exacerbation and quiescence as a result of episodic bursts of activity followed by periods of remission.

(Periods of quiescence are characterized by a reduced inflammatory response and little or no loss of bone and connective tissue attachment.)

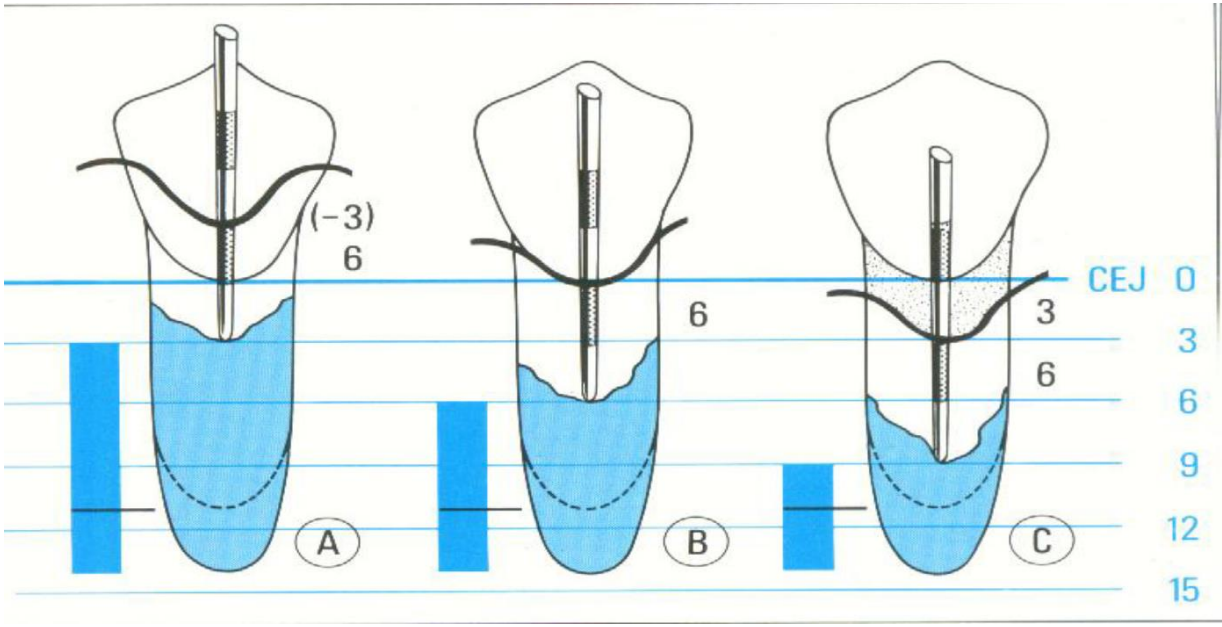
A buildup of unattached plaque, with its gram-negative, motile, and anaerobic bacteria ,

starts a period of exacerbation during which bone and connective tissue attachment are lost and the pocket deepens. **This period may last for days, weeks, or months,**

and it is eventually followed by a period of remission or quiescence during which gram-positive bacteria proliferate and a more stable condition is established.

Relationship of Attachment Loss and Bone

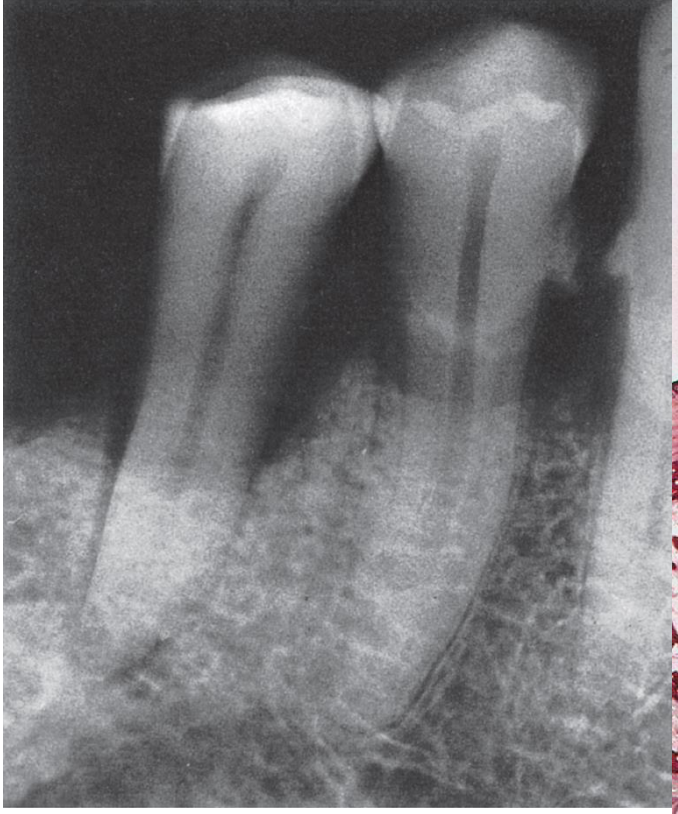
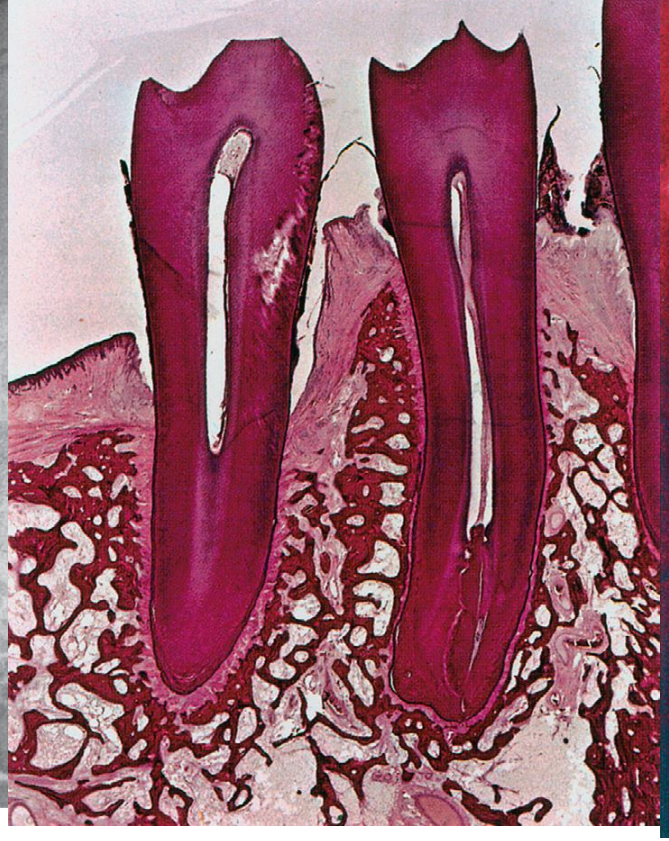
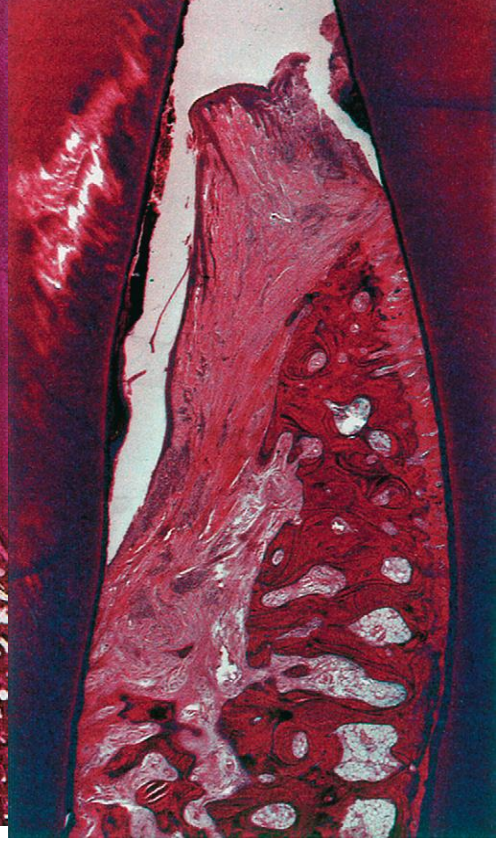
The severity of the attachment loss in pocket formation is generally but not always correlated with the depth of the pocket. Because the degree of attachment loss depends on the location of the base of the pocket on the root surface,



Relationship of Pocket to Bone

In infrabony pockets, the base of the pocket is apical to the crest of the alveolar bone, and the pocket wall lies between the tooth and the bone. The bone loss is in most cases vertical.

in suprabony pockets, the base is coronal to the crest of the alveolar bone, and the pocket wall lies coronal to the bone. The type of bone loss is always horizontal.

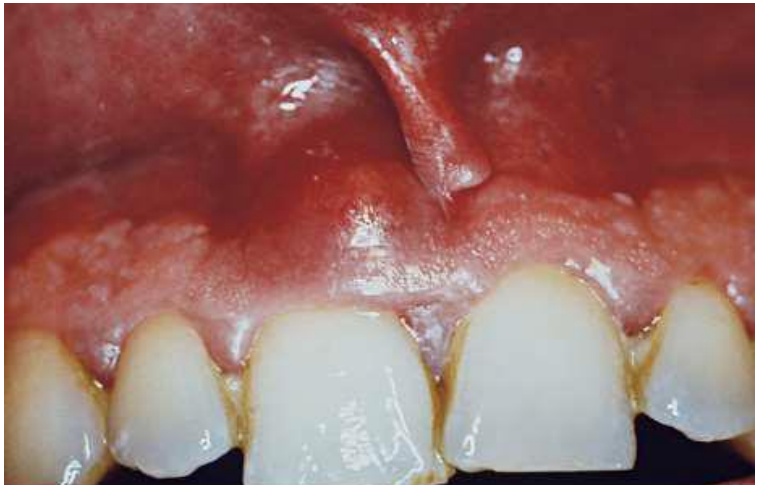




In infrabony pockets, the base of the pocket is apical to the crest of the alveolar bone, and the pocket wall lies between the tooth and the bone. The bone loss is in most cases vertical.

Periodontal Abscess

A periodontal abscess is a localized purulent inflammation in the periodontal tissue" It is also k/a lateral abscess or parietal abscess.

"abscess localized in gingiva, caused by injury to the outer surface of the gingiva, and not involving the supporting structure are called gingival abscesses"



Periodontal abscess on an upper right central incisor

Periodontal Cyst

The periodontal cyst is an uncommon lesion that produces localized destruction of the periodontal tissues along a lateral root surface, most often in the mandibular canine-premolar area.

It is considered to be derived from rests of Malassez or other proliferating odontogenic rests.

A periodontal cyst is usually asymptomatic, without grossly detectable changes, but it may present as a localized, tender swelling.

Reference

Carranza's

Clinical Periodontology

Twelfth Edition

Chapter 20 .


THANK YOU