CLASSIFICATION OF PERIODONTAL DISEASES AND CONDITIONS PART 1

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Objectives of the Lecture

- At the end of this lecture you should be able to:
  - Define gingivitis
  - Define periodontitis
  - Define Peri-Implantitis
  - Describe the key difference between gingivitis and periodontitis
  - Describe the 2018 AAP/EFP Classification of Periodontal diseases and conditions
  - Describe other types of periodontal diseases and conditions outlined in the 2018 AAP/EFP Classification

WHY DO WE CLASSIFY DISEASES?

- CLASSIFY
- DIAGNOSE
- SELECT APPROPRIATE TREATMENT

2018 AAP/EFP CLASSIFICATION OF PERIODONTAL DISEASES AND CONDITIONS

PERIODONTAL HEALTH, GINGIVAL DISEASES AND CONDITIONS	PERIODONTITIS	DEVELOPMENTAL AND ACQUIRED DEFORMITIES AND CONDITIONS AFFECTING THE PERIODONTIUM

CLASSIFICATION OF PERIODONTAL DISEASES AND CONDITIONS

PERIODONTAL HEALTH, GINGIVAL DISEASES AND CONDITIONS			PERIODONTITIS			DEVELOPMENTAL AND ACQUIRED DEFORMITIES AND CONDITIONS AFFECTING THE PERIODONTIUM			
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PERIODONTAL HEALTH AND GINGIVAL HEALTH	GINGIVITIS: DENTAL BIOFILM-INDUCED	GINGIVAL DISEASES: NON DENTAL BIOFILM-INDUCED	NECROTIZING PERIODONTAL DISEASES	PERIODONTITIS	SYSTEMIC DISEASES ASSOCIATED WITH LOSS OF PERIODONTAL SUPPORTING TISSUE	PERIODONTAL ABSCESSES AND ENDODONTIC – PERIODONTAL LESIONS	TOOTH AND PROSTHESIS RELATED FACTORS	MUCOGINGIVAL DEFORMITIES AND CONDITIONS	TRAUMATIC OCCLUSAL FORCES

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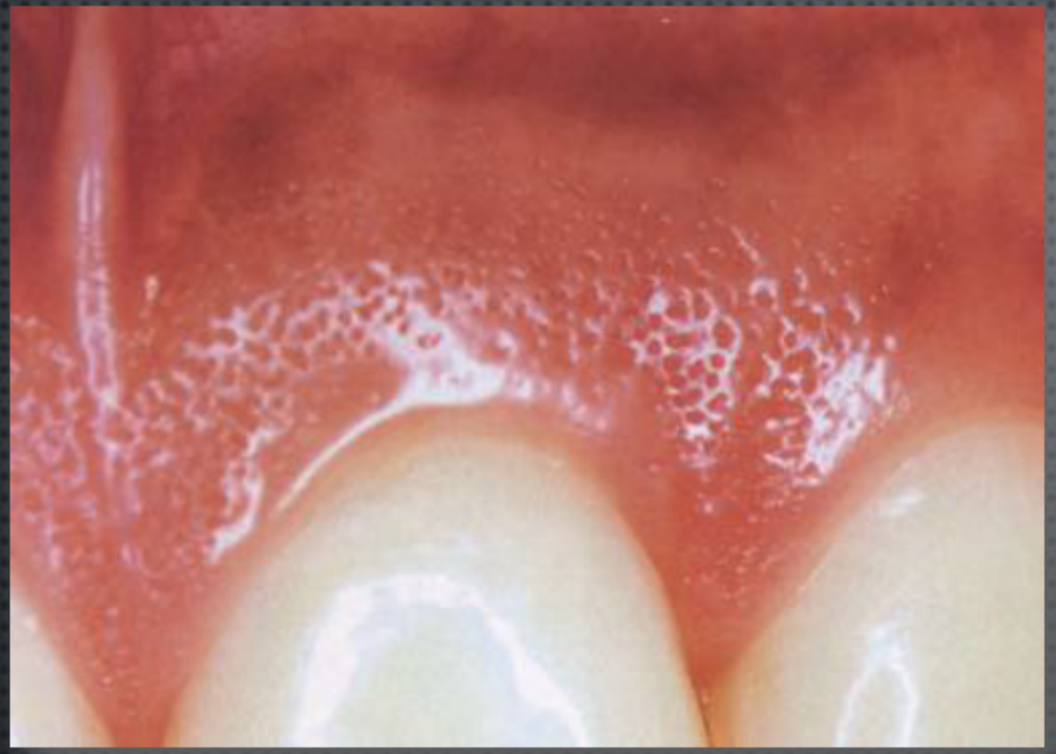
Periodontal health and gingival health

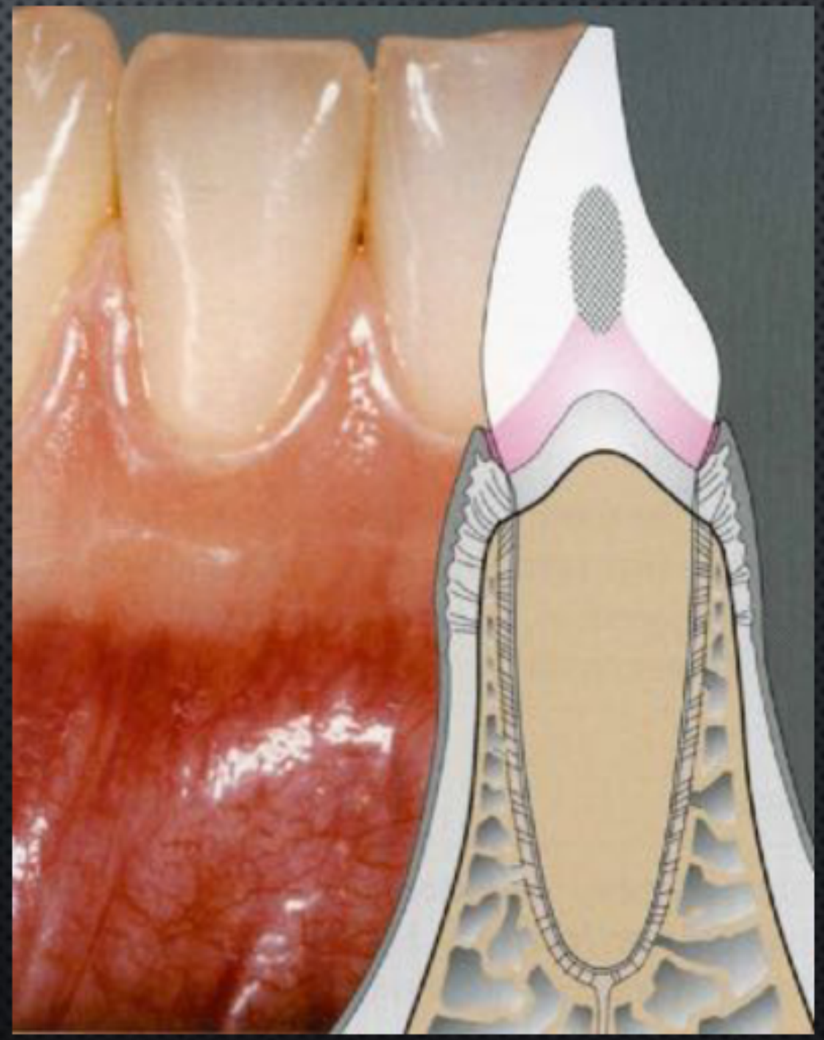
- Clinical gingival health and gingival health in an intact periodontium
- Clinical gingival health on a reduced periodontium
    i. Stable periodontitis patient
    ii. Non-periodontitis patient

CLINICAL GINGIVAL HEALTH AND GINGIVAL HEALTH IN AN INTACT PERIODONTIUM

less than 10% of sites have BOP, if any



Color: coral pink
Contour: knife edge margin
Consistency: firm
Texture: stippled (not always present in health)



CLINICAL GINGIVAL HEALTH AND GINGIVAL HEALTH IN AN INTACT PERIODONTIUM

CLINICAL GINGIVAL HEALTH AND GINGIVAL HEALTH IN AN INTACT PERIODONTIUM

CLINICAL GINGIVAL HEALTH ON A REDUCED PERIODONTIUM: STABLE PERIODONTITIS PATIENT

min. inflammation

↳ stays perio pt always (e.g. controlled diabetes)

CLINICAL GINGIVAL HEALTH ON A REDUCED PERIODONTIUM: NON-PERIODONTITIS PATIENT due to restoration

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due to plaque

THERE ARE TWO MAJOR FORMS OF PERIODONTAL DISEASE

- GINGIVITIS
- PERIODONTITIS

both inflammatory in periodontium

GINGIVITIS

- GINGIVITIS IS AN INFLAMMATORY RESPONSE LIMITED TO GINGIVAL TISSUES. GINGIVITIS DOES NOT CAUSE ATTACHMENT LOSS OR DESTRUCTION OF ALVEOLAR BONE

sharpey's + PDL fibers insert @ CEJ

PERIODONTITIS

- PERIODONTITIS IS AN INFLAMMATORY RESPONSE IN PERIODONTAL TISSUES. THE INFLAMMATORY RESPONSE LEADS TO DESTRUCTION OF THE GINGIVAL AND PERIODONTAL CONNECTIVE TISSUE ATTACHMENT, AND ALVEOLAR BONE.

WHAT IS THE KEY DIFFERENCE BETWEEN GINGIVITIS AND PERIODONTITIS?

- THE KEY DIFFERENCE IS THAT THERE IS NO ATTACHMENT LOSS AND BONE LOSS IN GINGIVITIS AND THERE IS ATTACHMENT LOSS AND BONE LOSS IN PERIODONTITIS

THE PRIMARY ETIOLOGY OF GINGIVITIS AND PERIODONTITIS IS THE MICROBIAL BIOFILM ASSOCIATED WITH TEETH

GINGIVITIS – DENTAL BIOFILM INDUCED

3 subcategories:

1 • ASSOCIATED WITH DENTAL BIOFILM ALONE

2 • MEDIATED BY SYSTEMIC OR LOCAL RISK FACTORS

3 • DRUG-INFLUENCED GINGIVAL ENLARGEMENT

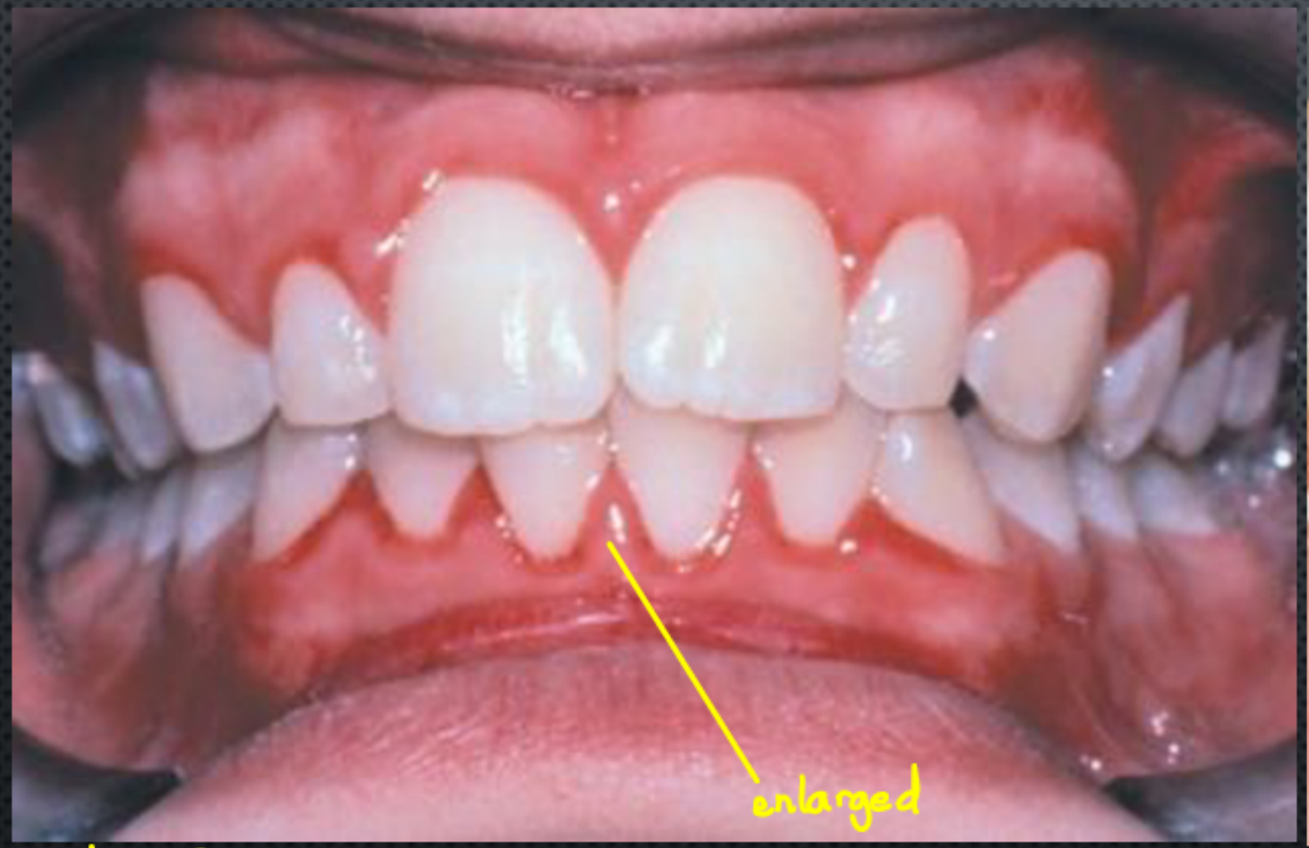
GINGIVITIS – DENTAL BIOFILM INDUCED

- ASSOCIATED WITH DENTAL BIOFILM ALONE

GINGIVITIS

biofilm induced alone

Greater than 10% of sites have bleeding on probing (BOP)



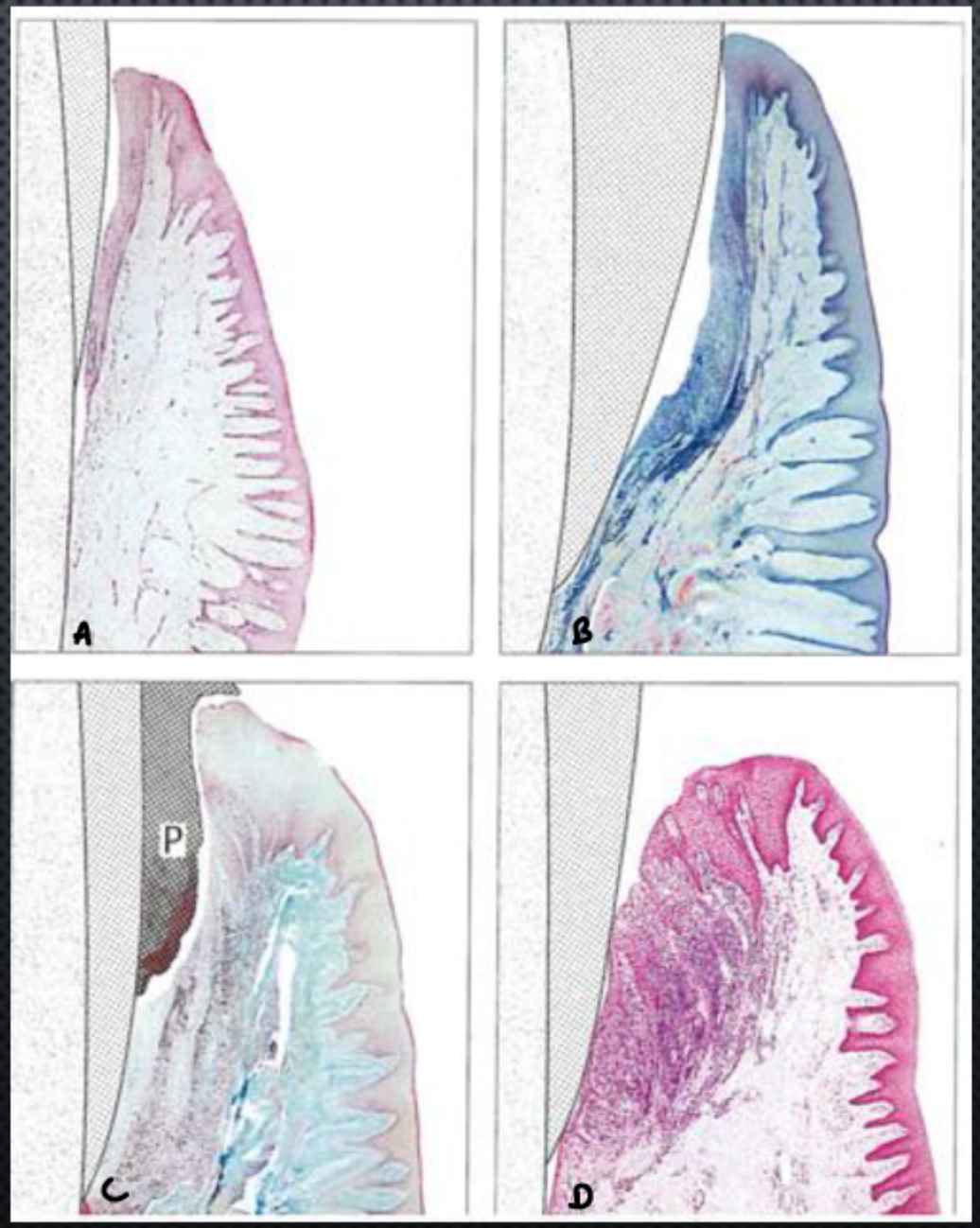
- esp marginal area
- vasodilation

Color: red, or if severe magenta (bluish-red) health = pink
Contour: rolled or enlarged gingival margin
Consistency: edematous ("spongy" fluid filled feel)
Texture: no stippling orange peel surface texture

EXPERIMENTAL GINGIVITIS

A health

B

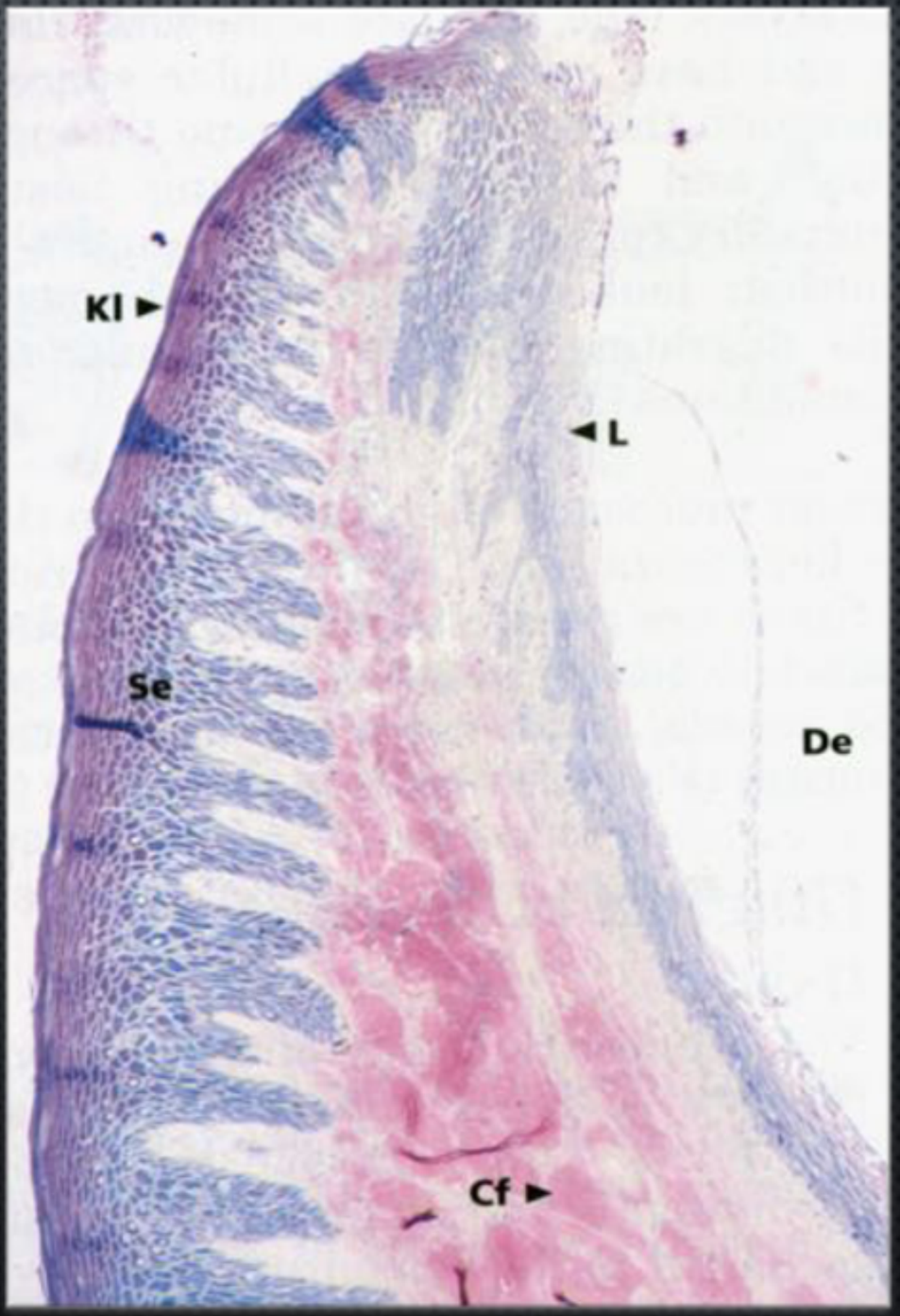


C

D gingivitis

EXPERIMENTAL GINGIVITIS

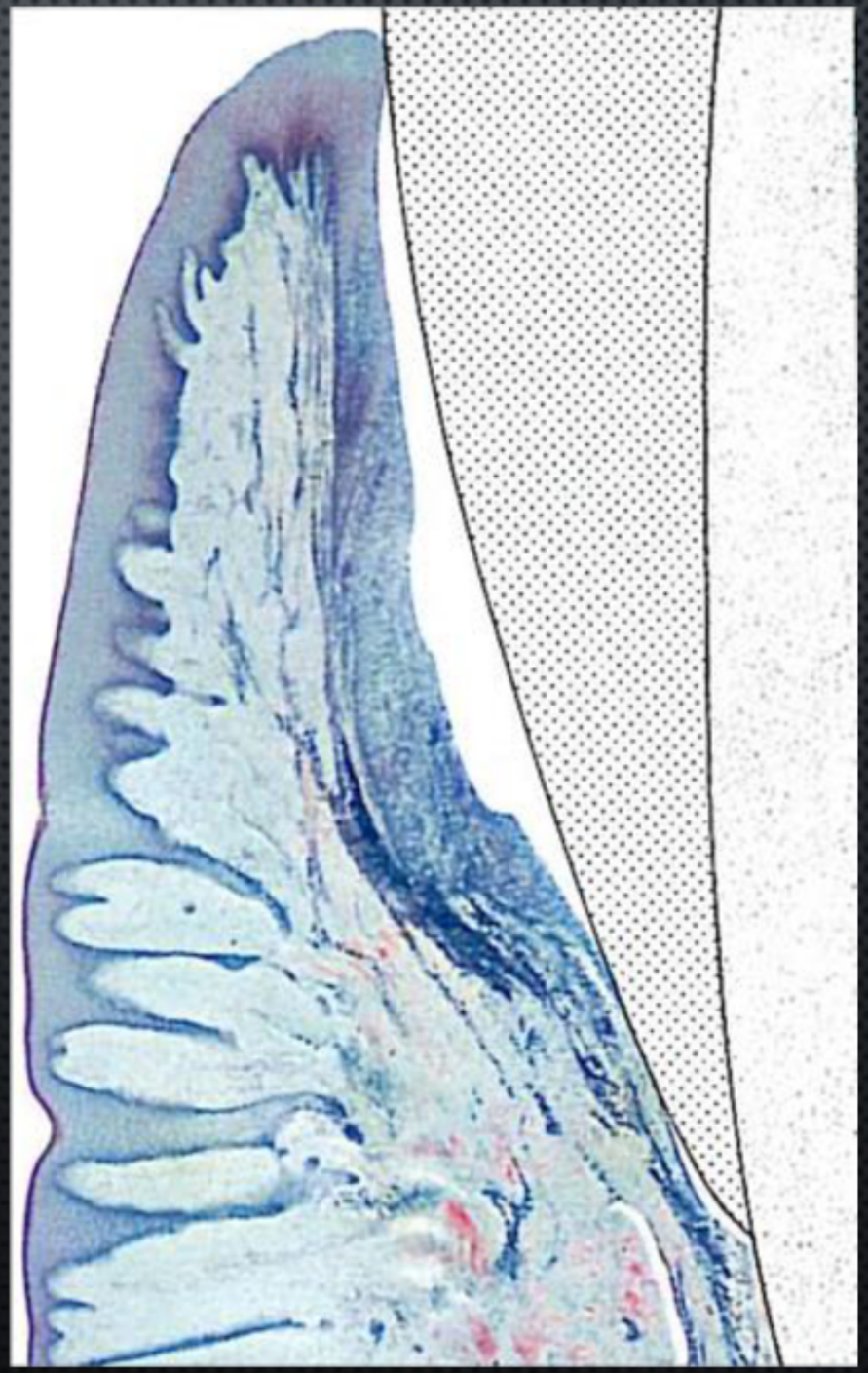
- DAY 0, HEALTH
- DENSE GINGIVAL COLLAGEN FIBERS (Cf)
- VESSELS NOT VISIBLE → not vasodilated
- VERY FEW IMMUNE CELLS
- NORMAL GINGIVAL EPITHELIUM RETE PEGS normal ht.
- SULCULAR EPITHELIUM NORMAL AND INTACT
- JUNCTIONAL EPITHELIUM NORMAL
- LITTLE TO NO GINGIVAL CREVICULAR FLUID IN SULCUS
- NO BLEEDING ON PROBING



EXPERIMENTAL GINGIVITIS

PMN is key cell
acute inflammation
LP → white spc
↓
dilates bv
↑ vasc perm.

- DAY 2-4, INITIAL LESION
- LOSS OF PERIVASCULAR COLLAGEN FIBERS
- VASODILATION, SLIGHTLY ELEVATED VASCULAR PERMEABILITY
- SMALL NUMBERS OF NEUTROPHILS (POLYMORPHONUCLEAR LEUKOCYTES, PMNS) PASS INTO AND THROUGH THE SULCULAR AND JUNCTIONAL EPITHELIA AND INTO THE CONNECTIVE TISSUE
- NORMAL GINGIVAL EPITHELIUM RETE PEGS
- SULCULAR EPITHELIUM NORMAL AND INTACT
- JUNCTIONAL EPITHELIUM NORMAL
- GINGIVAL CREVICULAR FLUID FOUND IN SULCUS
- NO BLEEDING ON PROBING



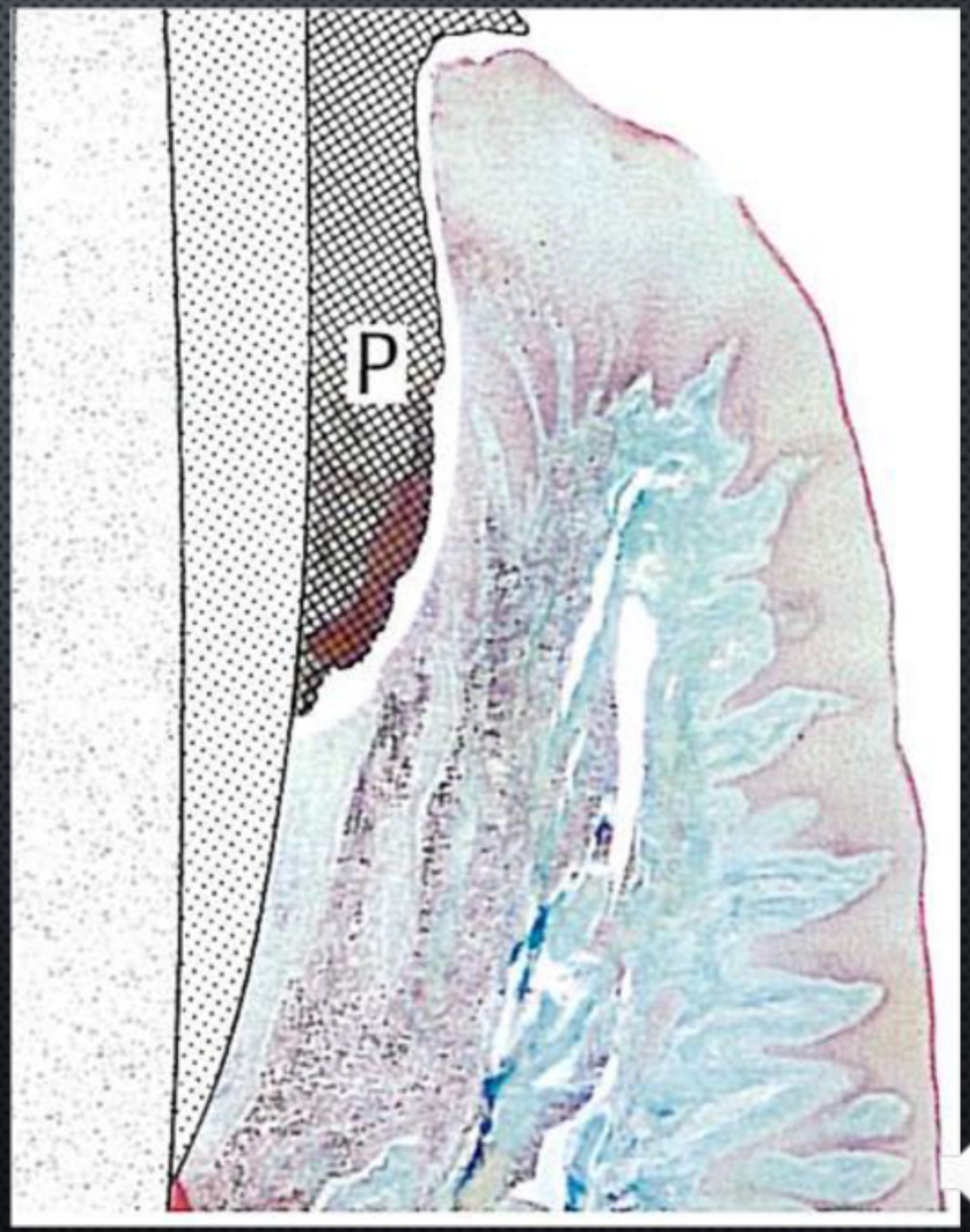
EXPERIMENTAL GINGIVITIS

- DAY 5-7, EARLY LESION
- LOSS OF PERIVASCULAR COLLAGEN FIBERS
- VASODILATION, VASCULAR PROLIFERATION, ELEVATED VASCULAR PERMEABILITY
- LARGE NUMBERS OF NEUTROPHILS AND ALSO LYMPHOCYTES PASS INTO AND THROUGH THE SULCULAR AND JUNCTIONAL EPITHELIA AND INTO THE CONNECTIVE TISSUE
- GINGIVAL EPITHELIUM RETE PEGS PROLIFERATE INTO GINGIVAL CONNECTIVE TISSUE WHERE THERE IS MORE LOSS OF COLLAGEN FIBERS/FEWER FIBROBLASTS
- SULCULAR EPITHELIUM AND JUNCTIONAL EPITHELIUM PROLIFERATE INTO GINGIVAL CONNECTIVE TISSUE, SULCULAR EPITHELIUM IS ULCERATED
- MORE GINGIVAL CREVICULAR FLUID FOUND IN SULCUS
- BLEEDING ON PROBING bc ulcerated sulcular e.

LP ↑ white spc bv vasodilated

- dark dots = PMN, lymphocyte

rete peg extend into CT of gingiva



EXPERIMENTAL GINGIVITIS

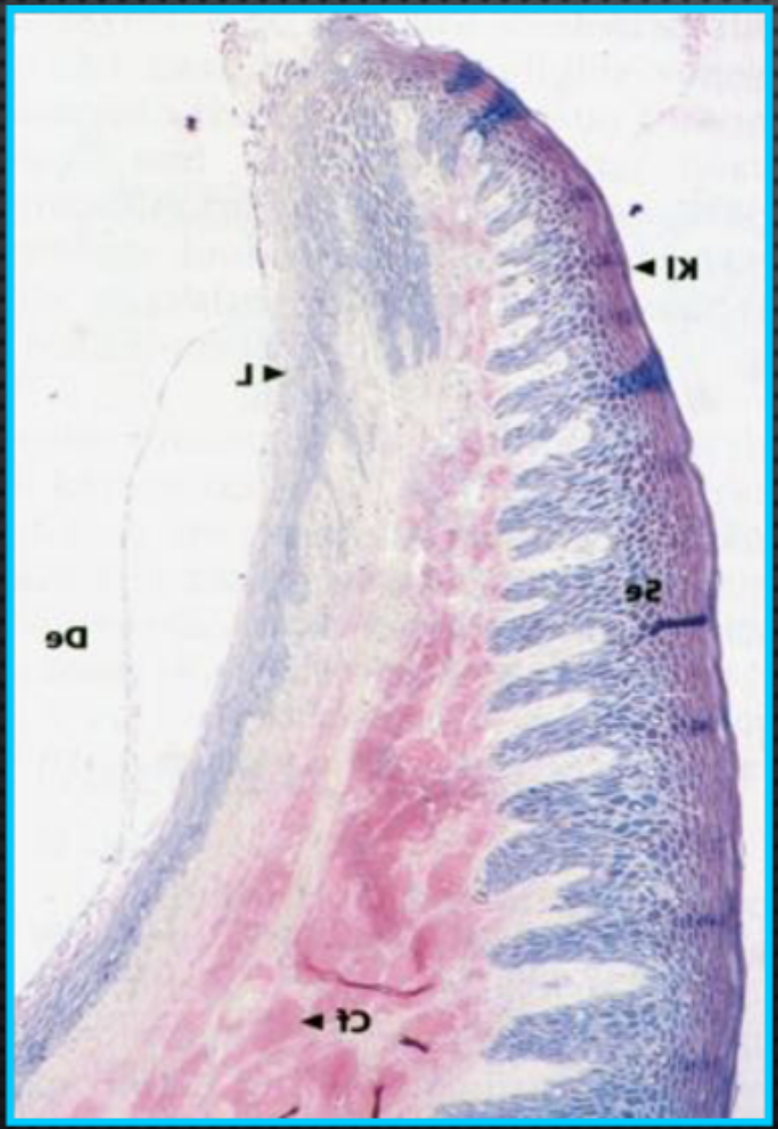
- Day 14-21, Established lesion
- Loss of perivascular collagen fibers
- Vasodilation, Vascular proliferation, elevated vascular permeability
- Dense inflammatory infiltrate (PMNs, lymphocytes, plasma cells), **plasma cells now dominate the lesion**
- Continued loss of collagen fibers and fibroblasts with proliferation of gingival connective tissue rete pegs
- Sulcular epithelium is ulcerated → BOP
- Sulcular epithelium and Junctional epithelium continue to proliferate into gingival connective tissue
- More gingival crevicular fluid found in sulcus
- Bleeding on probing, changes in contour, color, consistency

lots dark blk dots

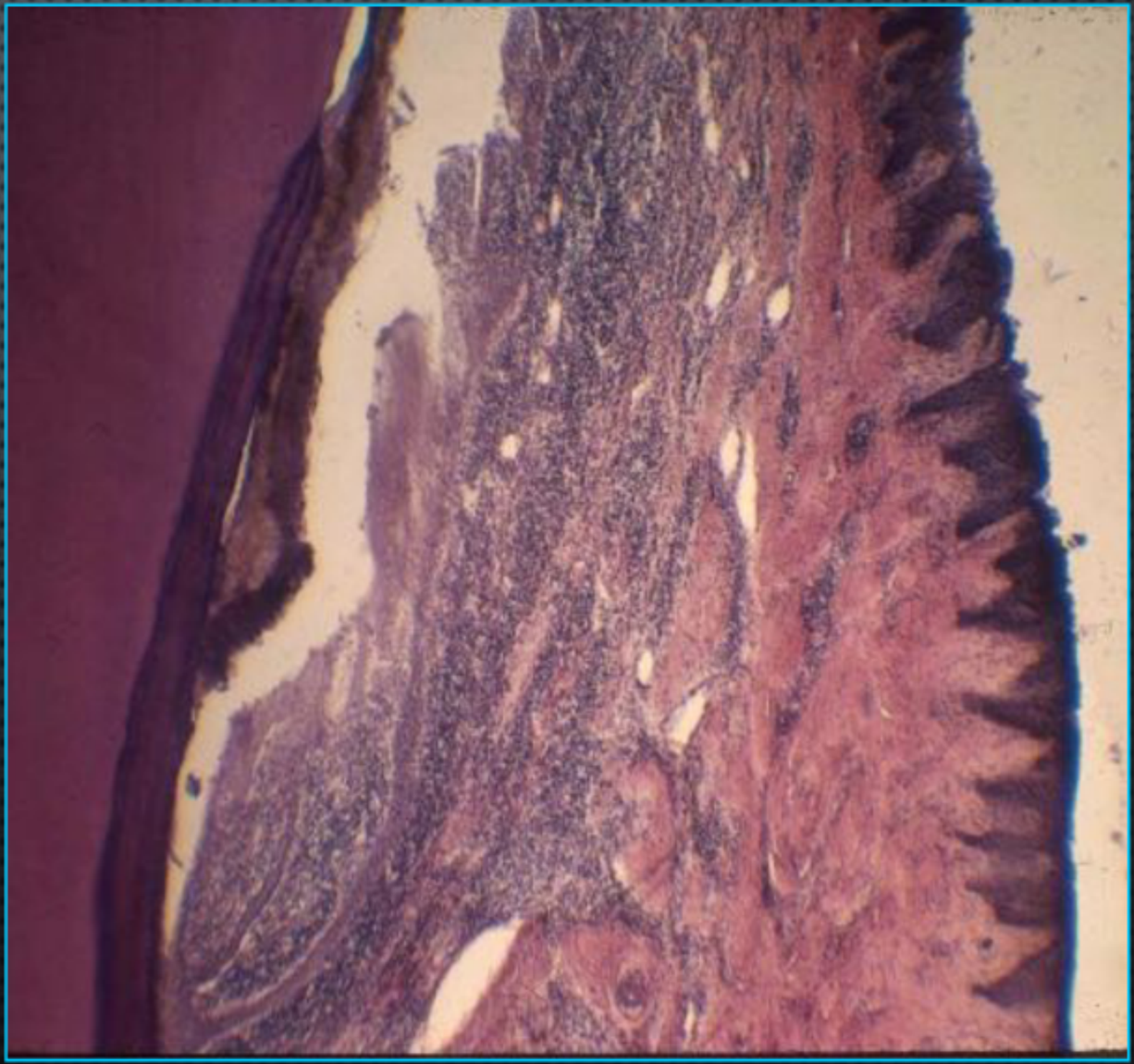
no attachment /bone loss bc gingivitis

same as gingivitis but also → • detached PDL + gingival CT fibers (attachment loss)
~ probe past CEJ - bone loss also

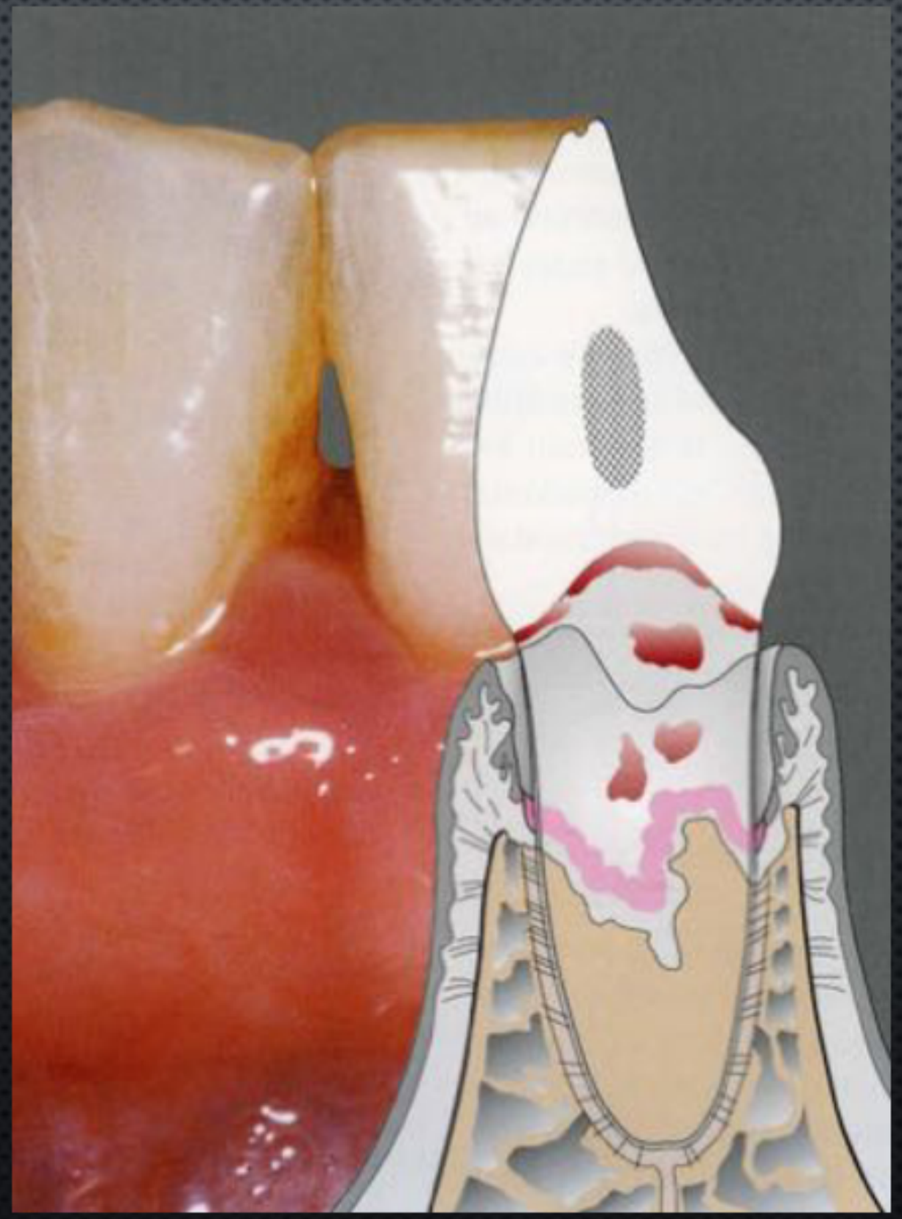
Healthy Gingival Crevice



Periodontal Pocket, Periodontitis



PERIODONTITIS



detachment:
- PDL
- gingival fibers

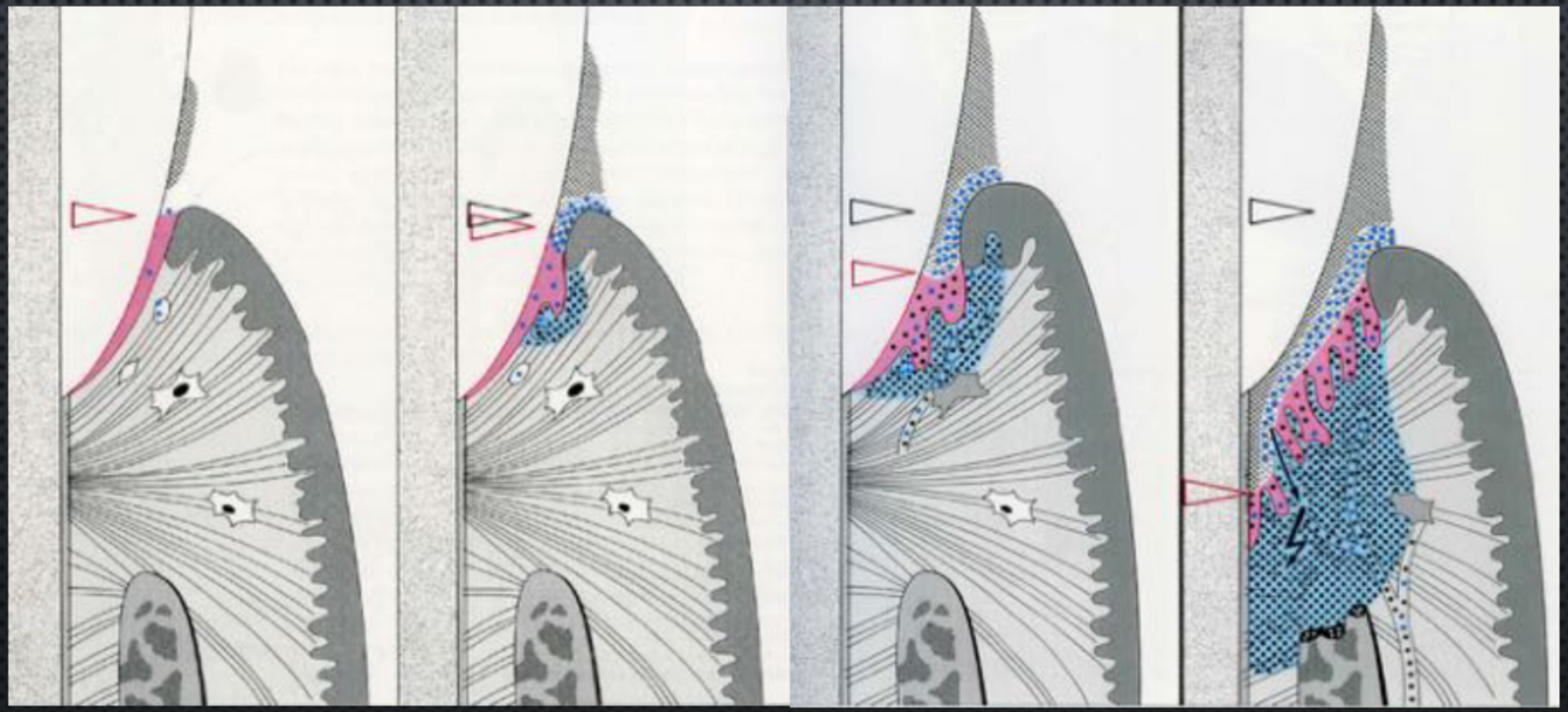
↑

loss of bone + attachment

↓

probe is more apical / deeper

The progression from health to Periodontitis



HEALTH

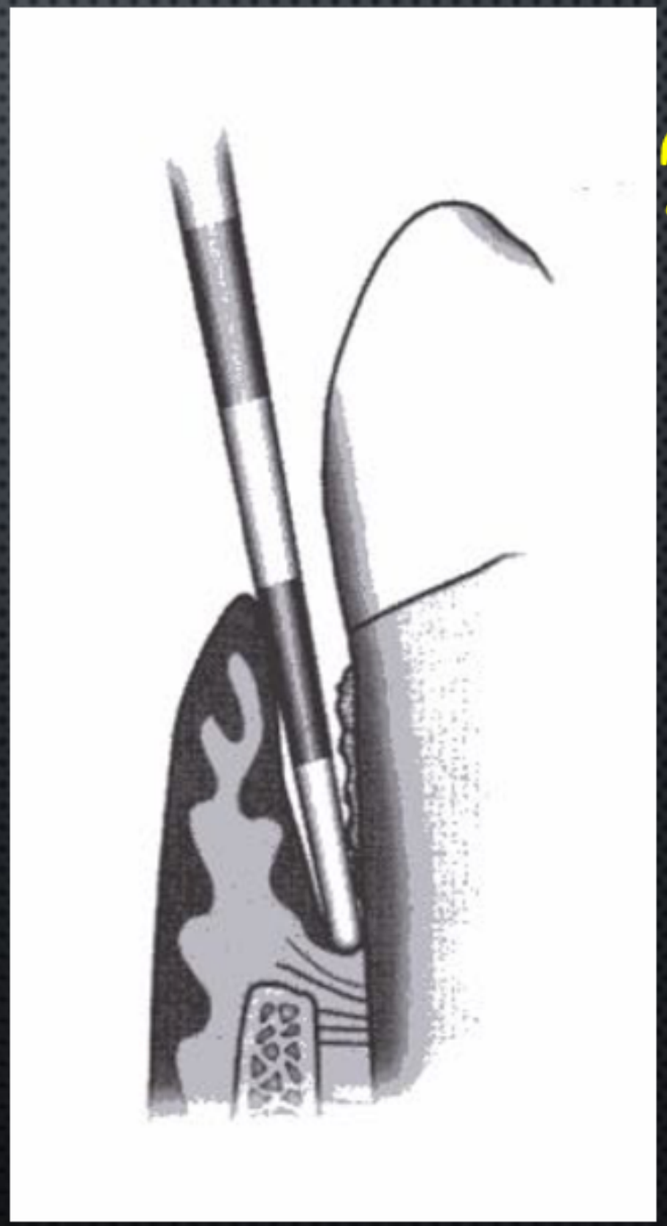
EARLY GINGIVITIS

ESTABLISHED GINGIVITIS

PERIODONTITIS

Rateitschak, et al Color Atlas of Dental Medicine, Periodontology 2nd ed

The basic lesion of Periodontitis is the Periodontal Pocket



PD = 6 mm
probe tip 4-5mm apical to CEJ
attachment loss

probe tip stops coronal to CEJ

probe into epithelium thru CT
~↓ density CT & ulceration epith. → BOP

probe tip apical CEJ

Health

No attachment loss
No bone loss

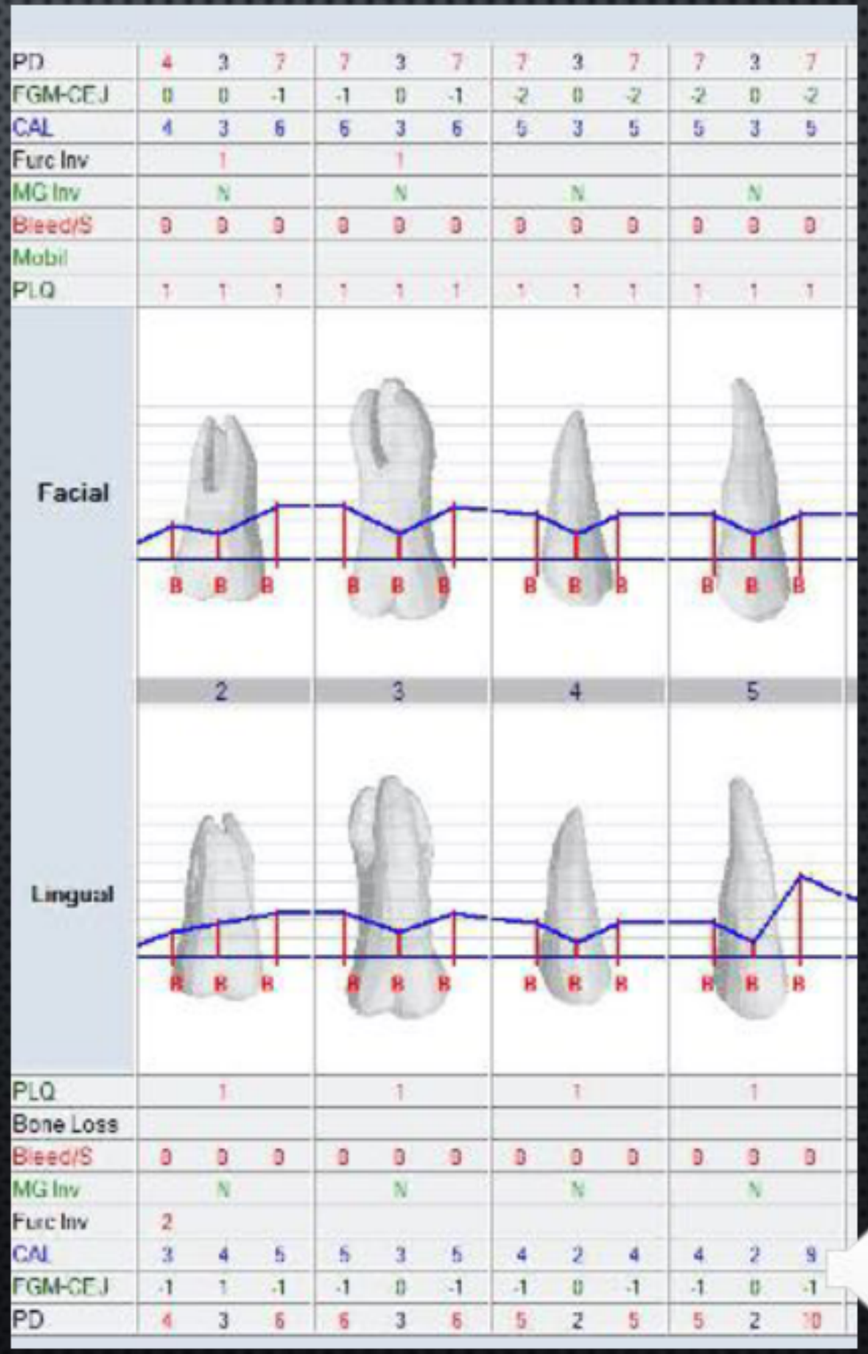
Gingivitis

No attachment loss
No bone loss

Periodontitis

Attachment loss
Bone loss

PERIODONTITIS



GINGIVITIS – DENTAL BIOFILM INDUCED

- MEDIATED BY SYSTEMIC OR LOCAL RISK FACTORS

Poor restoration margins or violation of the supracrestal attached tissues

replaces biologic width

Pregnancy gingivitis

GINGIVITIS – DENTAL BIOFILM INDUCED

- DRUG-INFLUENCED GINGIVAL ENLARGEMENT

2018 AAP/EFP CLASSIFICATION OF PERIODONTAL DISEASES AND CONDITIONS

PERIODONTAL HEALTH, GINGIVAL DISEASES AND CONDITIONS	PERIODONTITIS drop "chronic" and "agressive" terms	DEVELOPMENTAL AND ACQUIRED DEFORMITIES AND CONDITIONS AFFECTING THE PERIODONTIUM

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FORMS OF PERIODONTITIS

STAGES: BASED ON SEVERITY AND COMPLEXITY OF MANAGEMENT also: localized or generalized?

- STAGE I: INITIAL PERIODONTITIS
- STAGE II: MODERATE PERIODONTITIS
- STAGE III: SEVERE PERIODONTITIS WITH POTENTIAL FOR ADDITIONAL TOOTH LOSS
- STAGE IV: SEVERE PERIODONTITIS WITH POTENTIAL FOR LOSS OF THE DENTITION

FORMS OF PERIODONTITIS

EXTENT AND DISTRIBUTION:

- LOCALIZED < 30% OF TEETH WITH ATTACHMENT LOSS AT THE STAGE DEFINING LEVEL OF SEVERITY
- GENERALIZED ≥ 30% OF TEETH WITH ATTACHMENT LOSS AT THE STAGE DEFINING LEVEL OF SEVERITY
- MOLAR-INCISOR DISTRIBUTION

affected teeth : 1st

1st

  - A SPECIAL CASE WHERE YOU HAVE CIRUMPUBERTAL ONSET (10-16 YEARS OLD) AND A FAMILIAL PATTERN OF INHERITANCE

FORMS OF PERIODONTITIS

GRADES: EVIDENCE OF RISK OF RAPID PROGRESSION: ANTICIPATED TREATMENT RESPONSE

- GRADE A: SLOW RATE OF PROGRESSION
- GRADE B: MODERATE RATE OF PROGRESSION
- GRADE C: RAPID RATE OF PROGRESSION

RBL : radiographic bone loss

PERIODONTITIS: STAGING

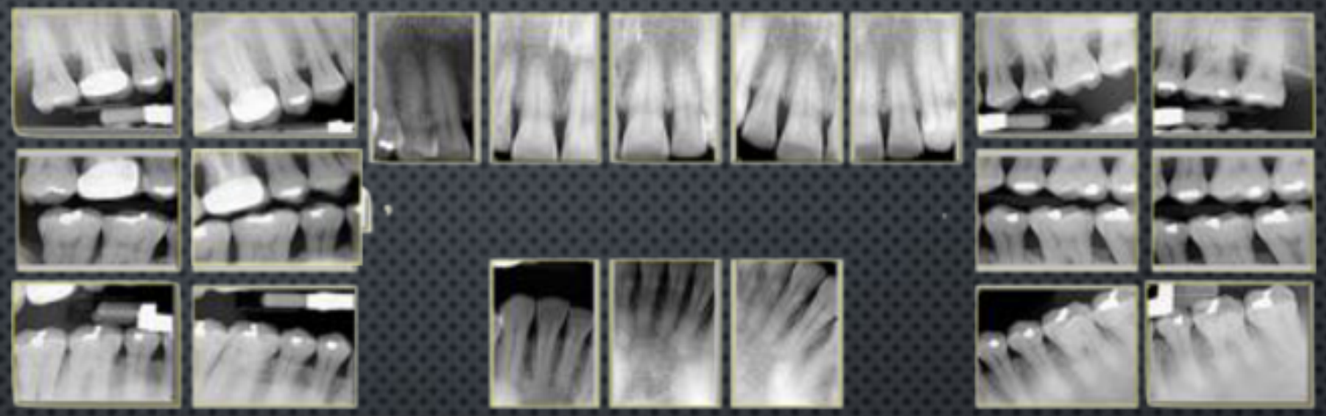
	Periodontitis	Stage I
	Interdental CAL (at site of greatest loss)	1 – 2 mm
Severity	RBL	Coronal third (<15%)
	Tooth loss (due to periodontitis)	No tooth loss
Complexity	Local	• Max. probing depth ≤ 4 mm • Mostly horizontal bone loss

PERIODONTITIS: STAGING

	Periodontitis	Stage II
	Interdental CAL (at site of greatest loss)	3 – 4 mm
Severity	RBL	Coronal third (15% - 33%)
	Tooth loss (due to periodontitis)	
Complexity	Local	• Max. probing depth ≤ 5 mm • Mostly horizontal bone loss

PERIODONTITIS: STAGE II

PERIODONTITIS: STAGE II



PERIODONTITIS: STAGING

	Periodontitis	Stage III
	Interdental CAL (at site of greatest loss)	≥ 5 mm
Severity	RBL	Extending to middle third of root and beyond
	Tooth loss (due to periodontitis)	≤ 4 teeth
Complexity	Local	In addition to Stage II complexity: • Probing depths ≥ 6 mm • Vertical bone loss ≥ 3 mm • Furcation involvement Class II or III • Moderate ridge defects

or risk for loss

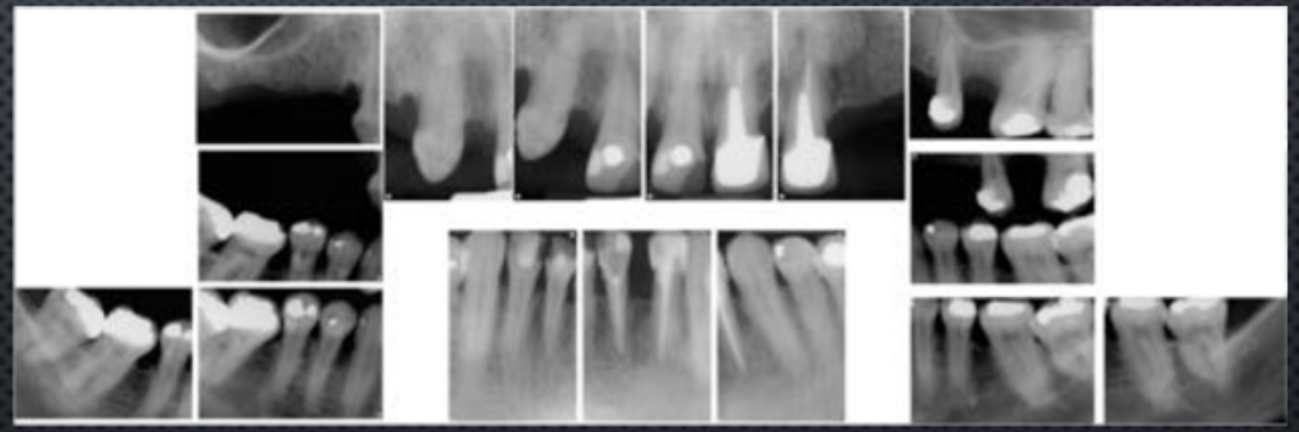
PERIODONTITIS: STAGE III

PERIODONTITIS: STAGING

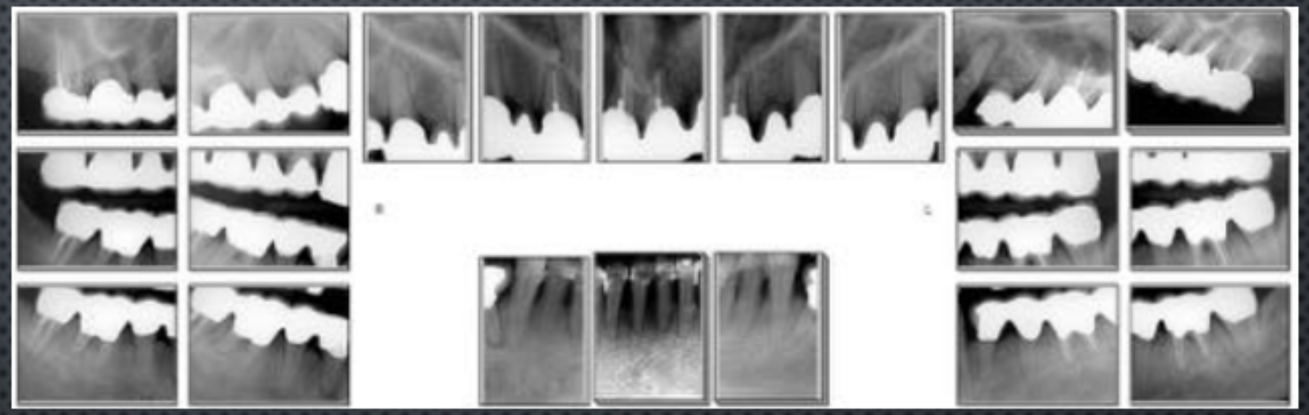
	Periodontitis	Stage IV
	Interdental CAL (at site of greatest loss)	≥ 5 mm
Severity	RBL	Extending to middle third of root and beyond
	Tooth loss (due to periodontitis)	≥ 5 teeth
Complexity	Local	In addition to Stage III complexity: • Need for complex rehabilitation due to: o Masticatory dysfunction o Secondary occlusal trauma (tooth mobility degree ≥2) o Severe ridge defects o Bite collapse, drifting, flaring o < 20 remaining teeth (10 opposing pairs)

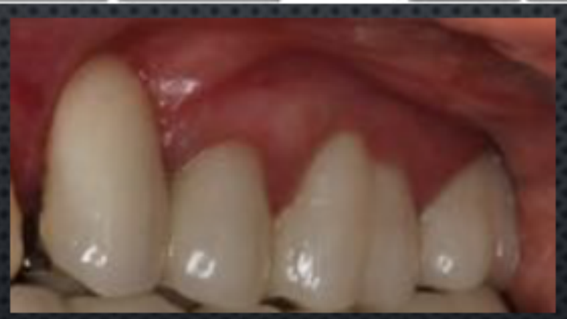
entire dentition @ risk

PERIODONTITIS: STAGE IV



PERIODONTITIS: STAGE IV





PERIODONTITIS: STAGE IV

WHAT ABOUT IF THERE IS ONLY BUCCAL AND LINGUAL ATTACHMENT LOSS??

- BUCCAL OR LINGUAL ATTACHMENT LOSS ASSOCIATED WITH GINGIVAL RECESSION (DUE TO TRAUMA, ANATOMIC CONSIDERATIONS, ETC) IS NOT PERIODONTITIS.
- THOUGH A UNCOMMON SITUATION, IF BUCCAL OR LINGUAL ATTACHMENT LOSS OF ≥3MM WITH NO INTERPROXIMAL ATTACHMENT LOSS OF BONE LOSS **AND** A PROBING DEPTH OF ≥ 3MM WHEN THERE IS NO OTHER NON-PERIODONTITS ETIOLOGY (EXAMPLE: VERTICAL ROOT FRACTURE, ENDONDONTIC LESION, TRAUMA, ETC.), THEN A DIAGNOSIS OF PERIODONTITIS CAN BE CONSIDERED.

rate of destruction

PERIODONTITIS: GRADING

	Progression		**Grade A: Slow Rate**
Primary Criteria Whenever available, direct evidence should be used	Direct evidence of progression	Radiographic bone loss or CAL	No loss over 5 years
	Indirect evidence of progression	% bone loss/age	<0.25
		Case phenotype	Heavy biofilm deposits with low levels of destruction
Grade modifiers	Risk factors	Smoking	Non-smoker
		Diabetes	Normoglycemic/no diagnosis of diabetes

PERIODONTITIS: GRADING

	Progression		**Grade B: Moderate Rate**
Primary Criteria Whenever available, direct evidence should be used	Direct evidence of progression	Radiographic bone loss or CAL	<2 mm over 5 years
	Indirect evidence of progression	% bone loss/age	0.25 to 1.0
		Case phenotype	Destruction commensurate with biofilm deposits
Grade modifiers	Risk factors	Smoking	<10 cigarettes/day (light smoker)
		Diabetes	HbA1c<7.0% in patients with diabetes (well-controlled)

PERIODONTITIS: GRADING

	Progression		**Grade C: Rapid Rate**
Primary Criteria Whenever available, direct evidence should be used	Direct evidence of progression	Radiographic bone loss or CAL	≥2 mm over 5 years
	Indirect evidence of progression	% bone loss/age	>1.0
		Case phenotype	Destruction exceeds given biofilms deposits; specific clinical patterns suggestive of periods of rapid progression and/or early onset disease
Grade modifiers	Risk factors	Smoking	≥10 cigarettes/day
		Diabetes	HbA1c ≥7.0% in patients with diabetes poorly controlled

ASSIGNING GRADE BY ATTACHMENT LOSS OR RADIOGRAPHIC BONE LOSS

- WHEN THE GRADE IS ASSIGNED BASED ON DIRECT EVIDENCE OF ATTACHMENT LOSS OVER TIME THEN THIS IS DONE BE ASSESSING CHANGES IN THE MOST SEVERE SITE.
- WHEN THE GRADE IS ASSIGNED BASED ON INDIRECT EVIDENCE RADIOGRAPHIC BONE LOSS/AGE, THIS IS DONE BE ASSESSING THE MOST SEVERE SITE.

Caveat: Classification of Periodontal Diseases and the NBDE

- The NBDE currently uses the 1999 AAP Workshop Classification
- When will the exam be updated to the current classification????
- Therefore you need to know both classifications as they relate to gingivitis and periodontitis

CAVEAT: CLASSIFICATION OF PERIODONTAL DISEASES AND THE NBDE

puberty/young adults; genetic

2 subforms

(old) (1)

- THE 1999 CLASSIFICATION RECOGNIZES "AGGRESSIVE PERIODONTITIS"
  - (a) THE MOLAR – INCISOR PATTERN OF THE 2018 CLASSIFICATION WAS "LOCALIZED AGGRESSIVE PERIODONTITIS"
  - (b) THERE WAS ALSO A DIAGNOSIS OF "GENERALIZED AGGRESSIVE PERIODONTITIS" WHICH IS NOT RECOGNIZED IN THE 2018 CLASSIFICATION

Workshop:	2015			2018			
	Slight	Moderate	Severe	Stage I slight	Stage II moderate	Stage III severe	Stage IV
Probing Depth	>3 to <5mm	≥5 to <7mm	≥7mm	Max ≤4mm	Max ≤5mm	Max ≥6mm	Max ≥6mm
Radiographic Bone Loss	Up to 15% of root length or ≥2- ≤3mm	16-30% of root length or ≥3 - ≤5mm	>30% or >5mm	<15%, coronal 1/3 mostly horizontal	15-33%, coronal 1/3 mostly horizontal	Extending to the middle 1/3 and beyond	Extending to the middle 1/3 and beyond
Clinical Attachment Loss	1-2mm	3-4mm	5+mm	1-2mm interdental	3-4mm interdental	≥5 interdental	≥5 interdental
Complexity						• Vertical bone loss ≥3mm • Class II or III furca • Moderate ridge defects	• Same as stage III plus: • Masticatory dysfunction • 2° occlusal trauma (mobility ≥2) • Severe ridge defects • Bite collapse, flariong, drifting • <20 remaining teeth(10 opposing pairs)

1999 VS 2018 CLASSIFICATION

- Slight Periodontitis = Stage I Periodontitis
- Moderate Chronic Periodontitis = Stage II Periodontitis
- Severe chronic Periodontitis = Stage III or State IV Periodontitis depending on extent and case complexity
- Localized aggressive periodontitis = Stage I – Stage III periodontitis molar – incisor pattern
  - Stage is dependent on attachment loss
  - Probably grade C as rate of bone loss given circumpubertal onset is likely >1
- Generalized aggressive periodontitis = Stage I – Stage IV periodontitis
  - Stage dependent on attachment loss
  - Probably grade C as rate of bone loss given circumpubertal onset is likely >1

1999/2015 VS 2018 CLASSIFICATION

- Key Points from the 1999/2015 Classification regarding aggressive periodontitis
  - Circumpubertal onset- attachment loss usually starts 10– 12 years of age but in the teenage years in any case before the age of 25 years
  - Familial- about ½ of the siblings in an affected family have aggressive disease (localized or generalized)
  - May be associated with elevated levels of *Aggregatibacter actinomycetemcomitans* and *Porphyromonas gingivalis*
  - In some cases the amount of plaque and calculus is inconsistent with the amount of destruction
  - Some cases have phagocyte abnormalities to phagocytose + kill bacteria
  - African Americans are 10X as likely to have this disease- gene frequency estimated as 1% of the population as opposed to 0.1% for Caucasians.

THREE STEPS TO STAGING AND GRADING A PATIENT

Step 1: **Initial Case Overview to Assess Disease**	Screen: • Full mouth probing depths • Full mouth radiographs • Missing teeth Mild to moderate periodontitis will typically be either Stage I or Stage II. Severe to very severe periodontitis will typically be either Stage III or Stage IV.

THREE STEPS TO STAGING AND GRADING A PATIENT

Step 2: **Establish Stage**	For mild to moderate periodontitis (typically Stage I or Stage II): • Confirm clinical attachment loss (CAL) • Rule out non-periodontitis causes of CAL (e.g., cervical restorations or caries, root fractures, CAL due to traumatic causes) • Determine maximum CAL or radiographic bone loss (RBL) • Confirm RBL patterns

THREE STEPS TO STAGING AND GRADING A PATIENT

Step 2: **Establish Stage**	For moderate to severe periodontitis (typically Stage III or Stage IV): • Determine maximum CAL or RBL • Confirm RBL patterns • Assess tooth loss due to periodontitis • Evaluate case complexity factors (e.g., severe CAL frequency, surgical challenges)

THREE STEPS TO STAGING AND GRADING A PATIENT

Step 3: **Establish Grade**	• Calculate RBL (% of root length x 100 divided by age) • Assess risk factors (e.g., smoking, diabetes) • Measure response to scaling and root planing and plaque control • Assess expected rate of bone loss • Conduct detailed risk assessment • Account for medical and systemic inflammatory considerations

THANKS FOR YOUR ATTENTION