1. Medicine I: Introduction to Oral and Maxillofacial Pathology...

Medicine I: Introduction to Oral and Maxillofacial Pathology

2005

Michael A. Kahn, DDS
Professor and Diplomate
Department of Oral and Maxillofacial Pathology
Tufts University School of Dental Medicine

2. Introduction – Four Objectives

Introduction – Four Objectives

1. Description of Soft Tissue Lesions of the Oral Cavity
   - Site, morphology, color, size
2. Premalignant Oral Lesions
   - Leukoplakia, erythroplakia
3. Screening Tools to Detect Oral Cancer
   - Conventional and liquid-based cytology, brush biopsy, toluidine blue, chemiluminescence
4. Diagnostic Tools to Diagnose Oral Cancer
   - Scalpel biopsy, punch biopsy, laser biopsy

3. Definition of Oral and Maxillofacial Pathology

Definition of Oral and Maxillofacial Pathology

- The specialty of dentistry & pathology which deals with the nature, identification, & management of diseases affecting the oral & maxillofacial regions. It is a science that investigates the causes, processes, & effects of these diseases.

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4. Definition of Oral and Maxillofacial Pathology

Definition of Oral and Maxillofacial Pathology

- The practice of oral & maxillofacial pathology includes research, diagnosis of diseases using clinical, radiographic, microscopic, biochemical or other examinations, & management of patients.

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5. Diagnosis of Soft Tissue Lesions

Diagnosis of Soft Tissue Lesions

- Description – "The Big 3 Plus One"
  - ✓Site
  - ✓Morphology
  - ✓Color
  - •Size

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6. Site

Site

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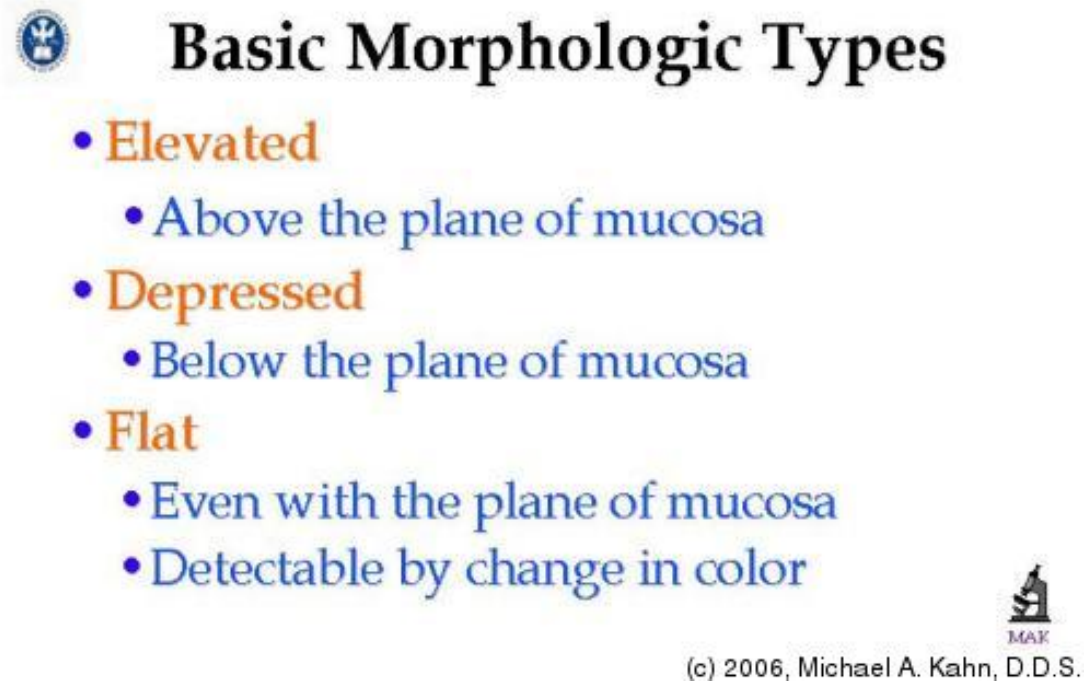
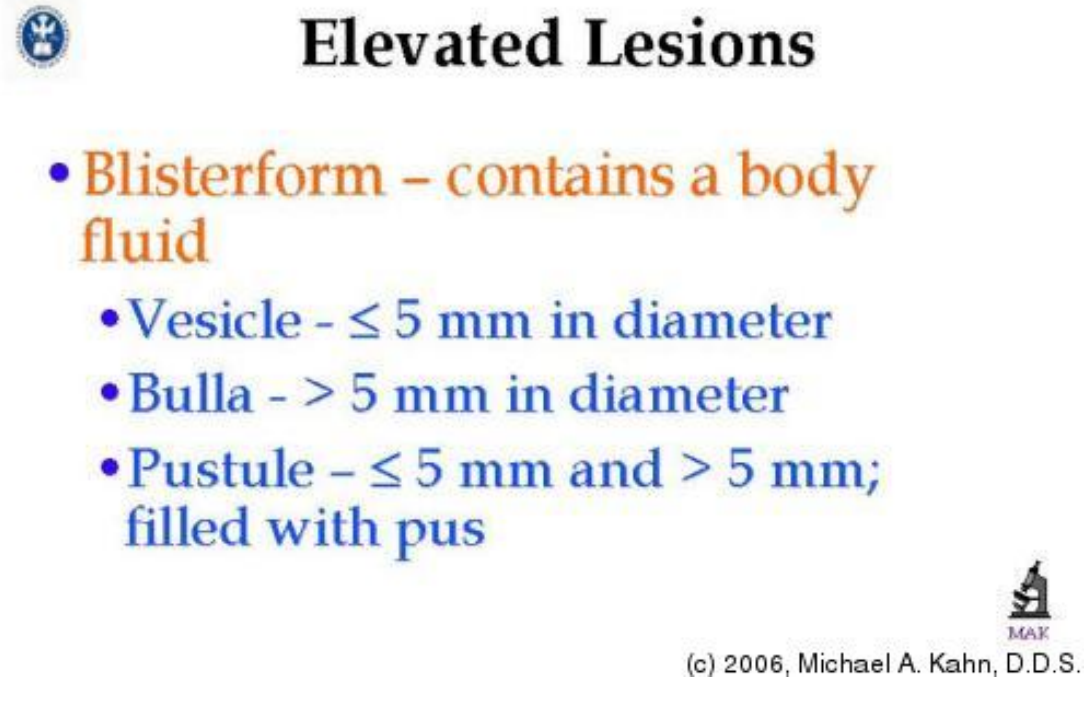
7. Oral Pathology: Physical Examination: Slide 7

8. Oral Pathology: Physical Examination: Slide 8

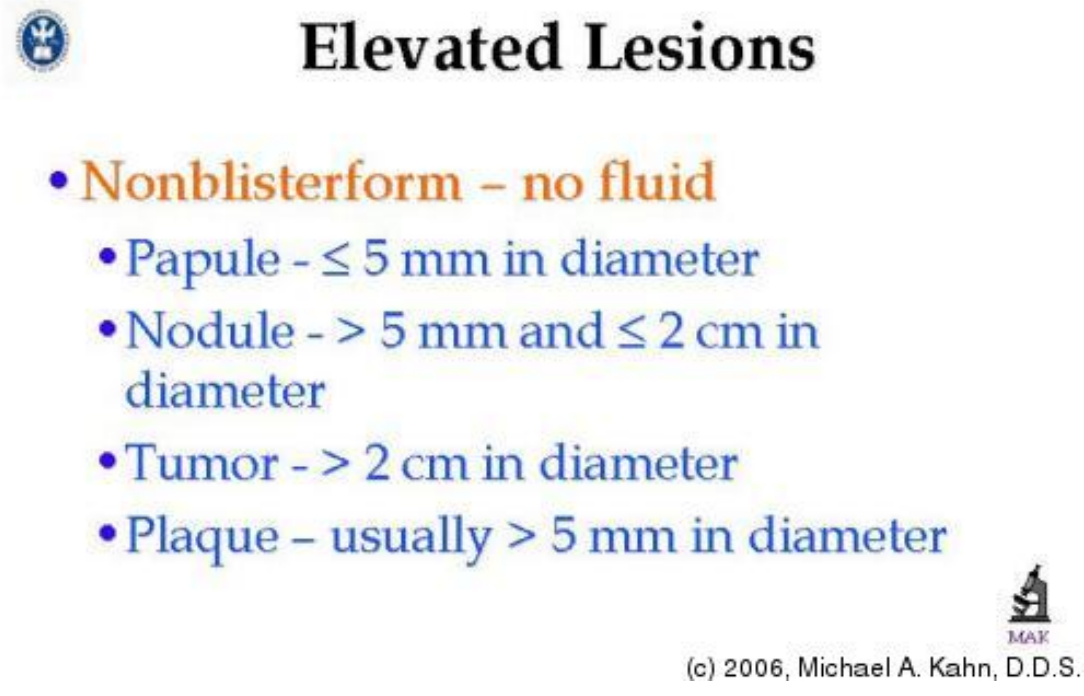
9. Basic Morphologic Types



10. Elevated Lesions

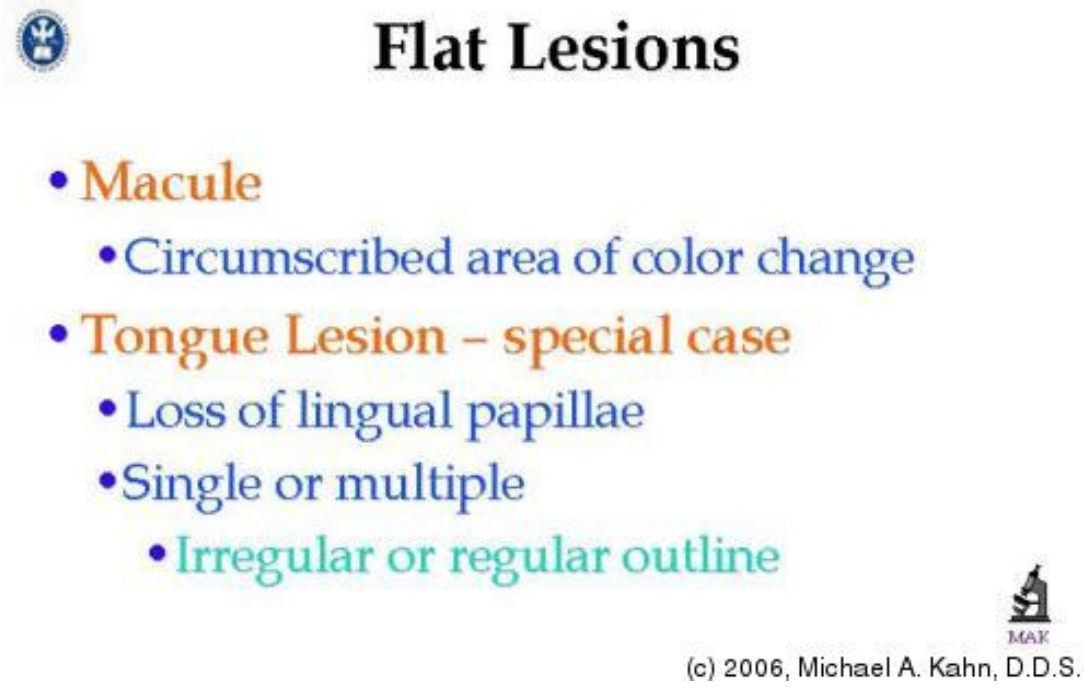


11. Elevated Lesions

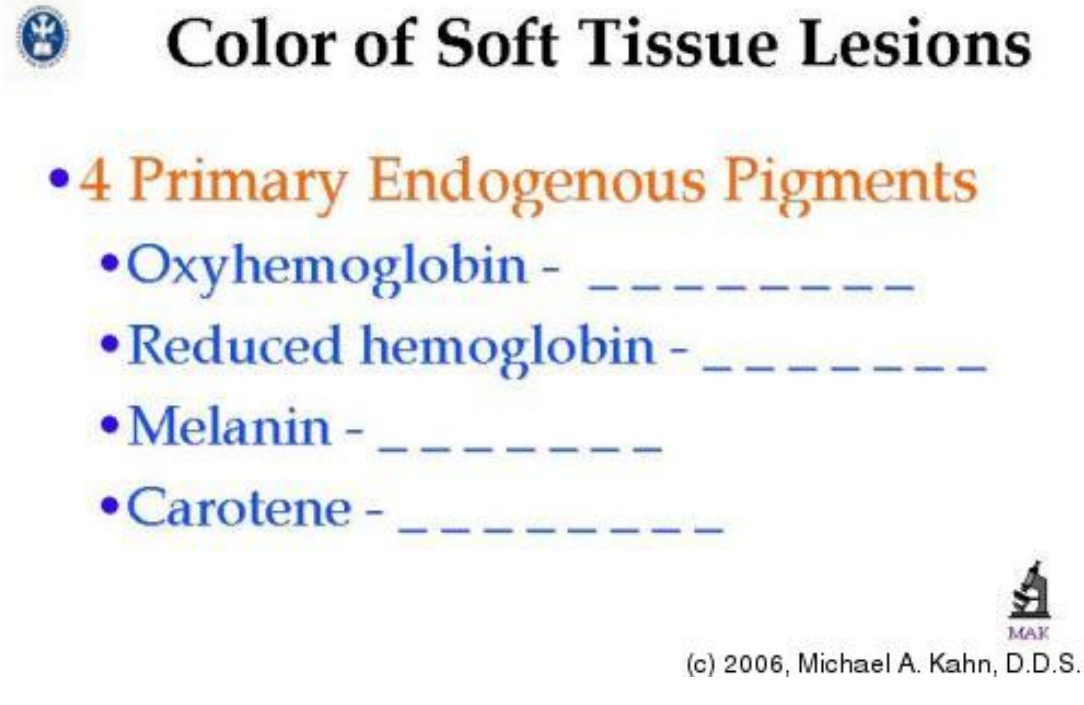


12. Depressed Lesions

13. Flat Lesions



14. Color of Soft Tissue Lesions



15. Color of Soft Tissue Lesions

Color of Soft Tissue Lesions

- Red – 80%
- Pink – 50%
- White – 50%
- Red and White – 34%
- Blue – 13%
- Purple – 8%
- Gray – 7%

- Black – 7%
- Brown – 5%
- Translucent
  - Pink
  - Blue
  - Red or purple

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16. Color of Soft Tissue Lesions

Color of Soft Tissue Lesions

- Extravascular (red and macular)
  - Purpura
    - Petechia – 1-5 mm in diameter
    - Ecchymosis - > 5 mm in diameter
    - Hematoma - > 2 cm in diameter
      - Elevated in early stages

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17. Miscellaneous Terminology

Miscellaneous Terminology

- Ulceration vs. erosion
- Keratosis
- Sessile vs. pedunculated
- Smooth vs. rough
  - Papillary; papillomatous
  - Verrucous; verrucoid

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18. A 4.0 mm Sessile

A 4.0 mm sessile, smooth, yellow vesicle of the right anterior floor of mouth.

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19. A 6.0 mm Gray-black Macule

A 6.0 mm gray-black macule of the left, posterior mandibular vestibule adjacent to tooth #19.

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20. A 2.5 cm x 1.7 cm Sessile

A 2.5 cm x 1.7 cm sessile, smooth, bosselated, pink-red tumor of the left anterior maxillary alveolar ridge.

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21. A 1.0 cm Diameter Deep Ovoid Ulcer

A 1.0 cm diameter, deep, ovoid ulcer of the right posterior hard palate exhibiting raised, regular margins and extending to the midline.

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22. A 1.1 cm, Blue Bulla

A 1.1 cm, blue bulla of the left anterior floor of mouth.

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23. A 5.0 mm, Pedunculated, White, Papillary Papule

A 5.0 mm, pedunculated, white, papillary papule of the left, mid- lateral border of the tongue.

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24. Bilateral, Multiple Individual and Confluent, Red Macules

Bilateral, multiple individual and confluent, red macules (i.e., ecchymosis) at the junction of the hard and soft palate, measuring, in aggregate, 1.2 cm x 0.6 cm.

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25. Classic Warning Signs of Cancer

Classic Warning Signs of Cancer

- Any change in bowel or bladder habits
- Any change in a mole on the skin
- Persistent cough or hoarseness
- Persistent indigestion or dysphagia

- ✓ Difficulty in speaking or chewing
- ✓ A lump or thickening in mucosa, gland or lymph node area
- ✓ An ulcer that does not heal
- ✓ Abnormal bleeding or discharge
- ✓ Pain or numbness

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26. Highest Risk Sites

Highest Risk Sites – Premalignant and Malignancy (Squamous cell carcinoma)

- Lower lip
  - Skin/vermilion
- Tongue
  - Lateral and ventral
- Floor of mouth
- Soft palate complex
  - Uvula
  - Soft palate proper
  - Anterior tonsillar pillar
  - Lingual retromolar trigone

Mashberg, Samit. Early Diagnosis of Oral Cancer, ACS, 1969

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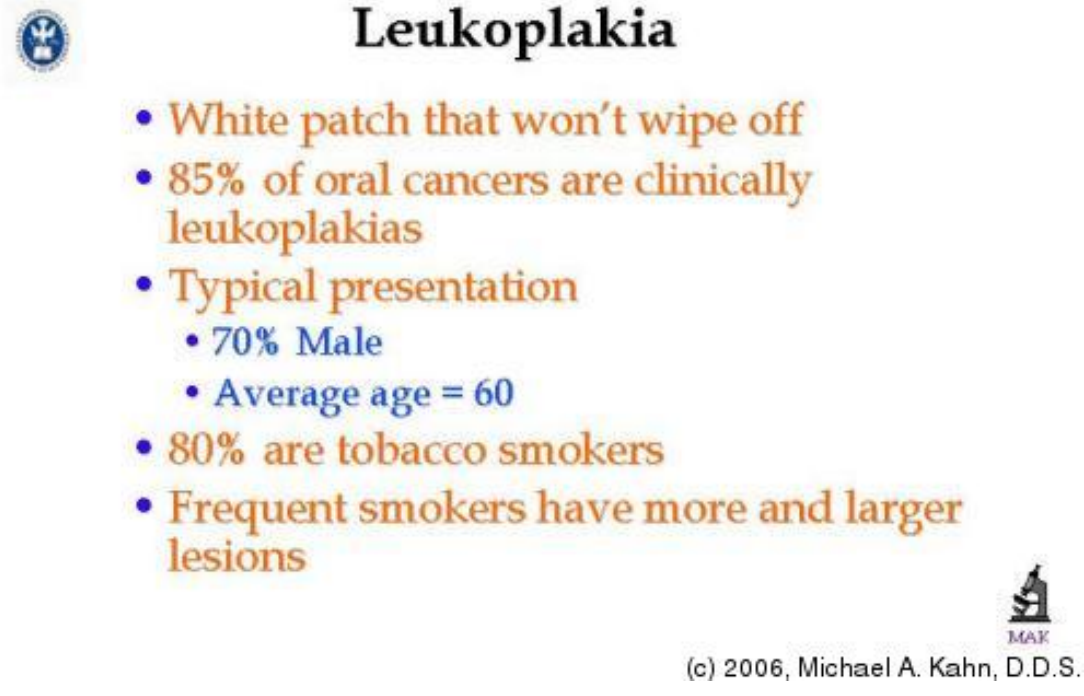
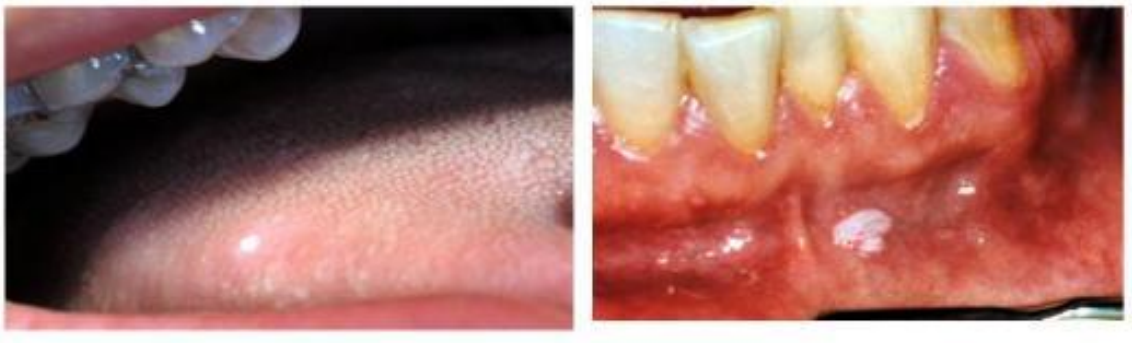
27. Leukoplakia

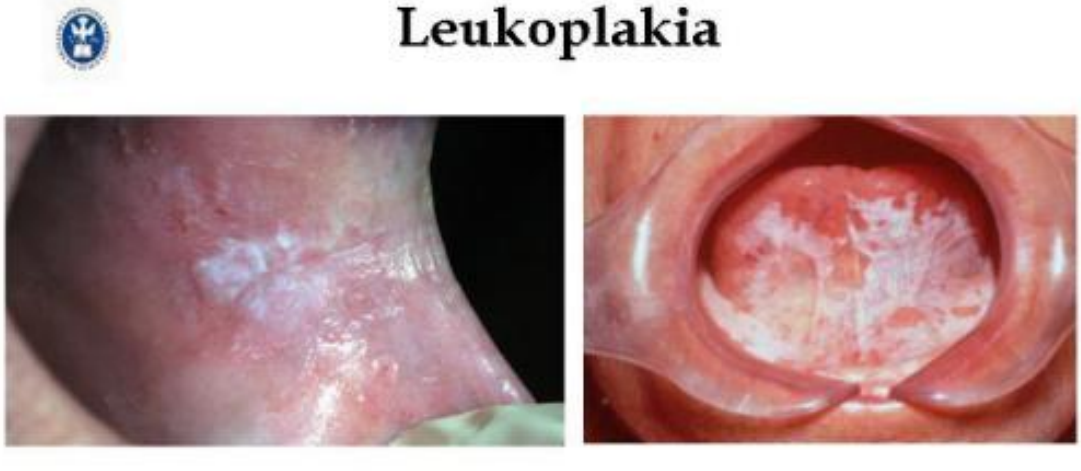


28. Leukoplakia

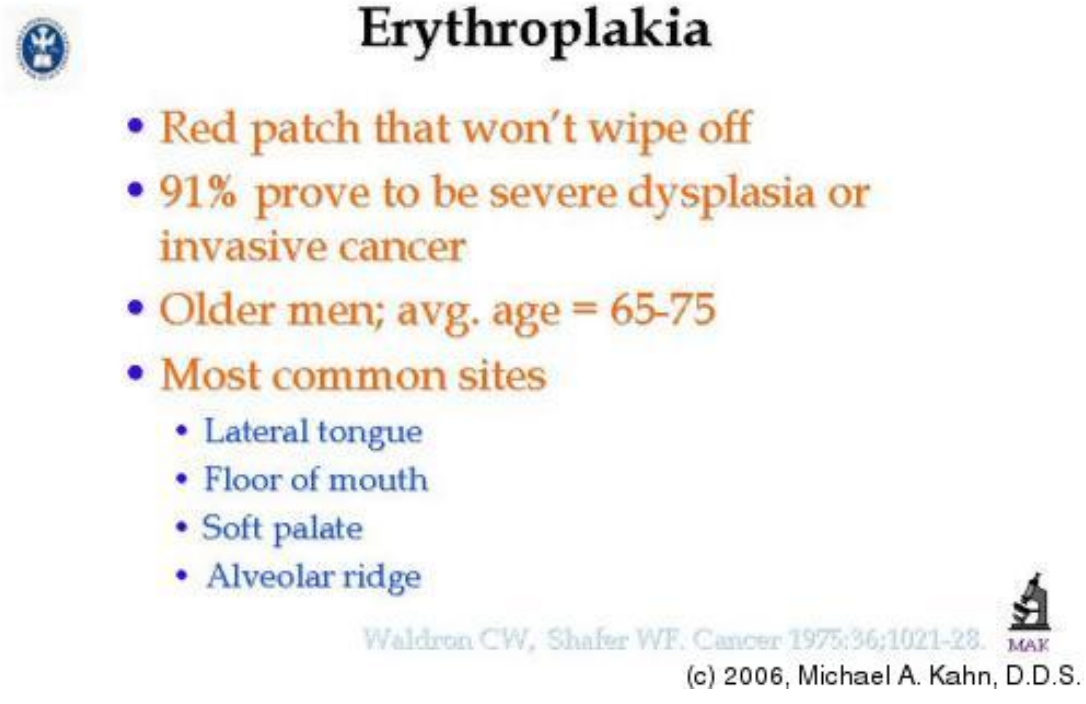
29. Leukoplakia



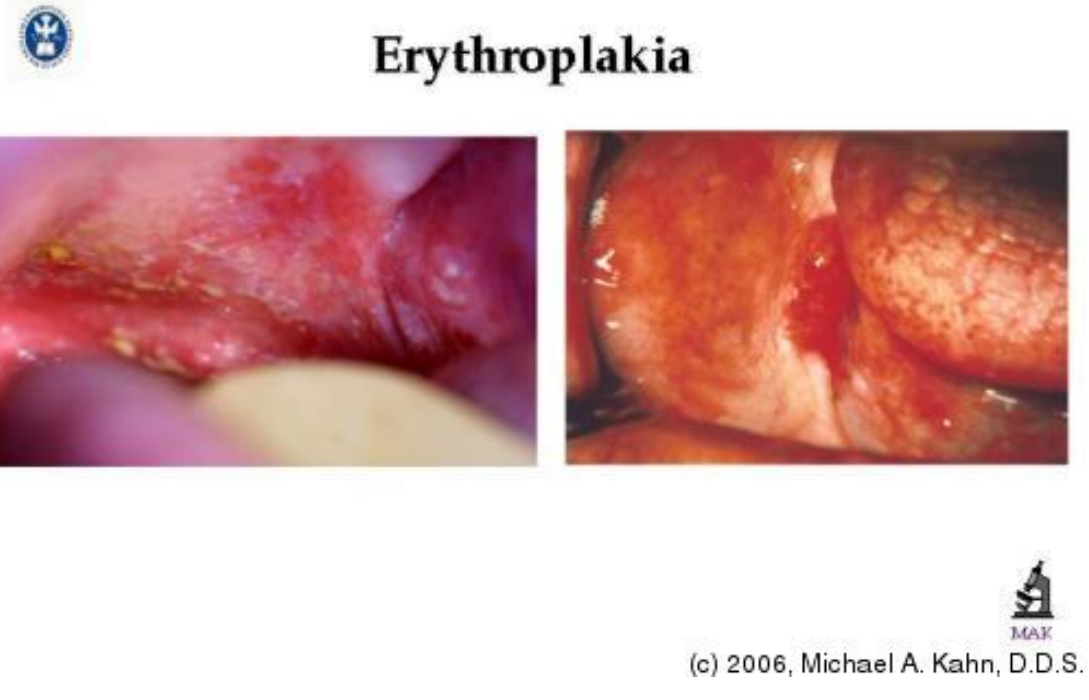
30. Leukoplakia



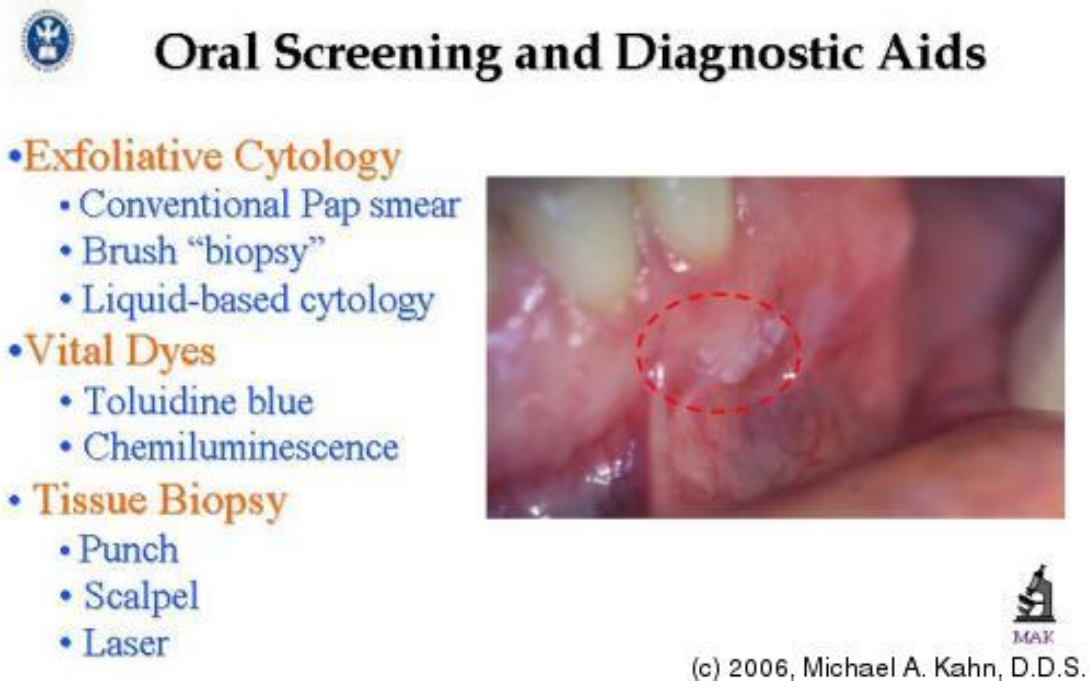
31. Erythroplakia



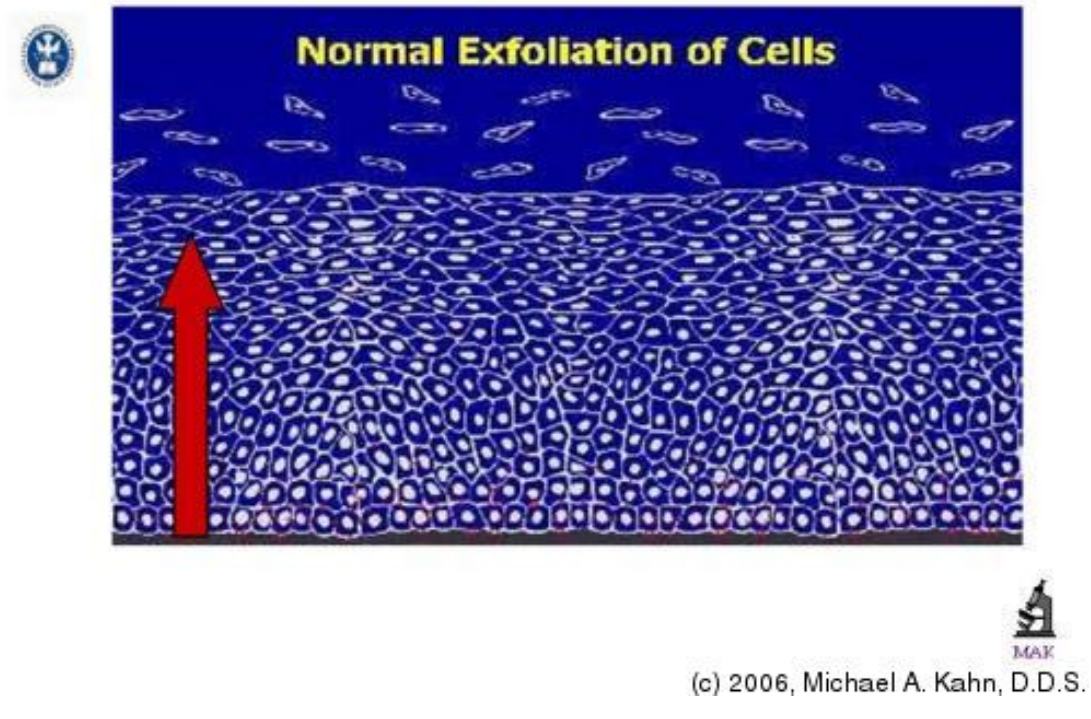
32. Oral Pathology: Physical Examination: Slide 32



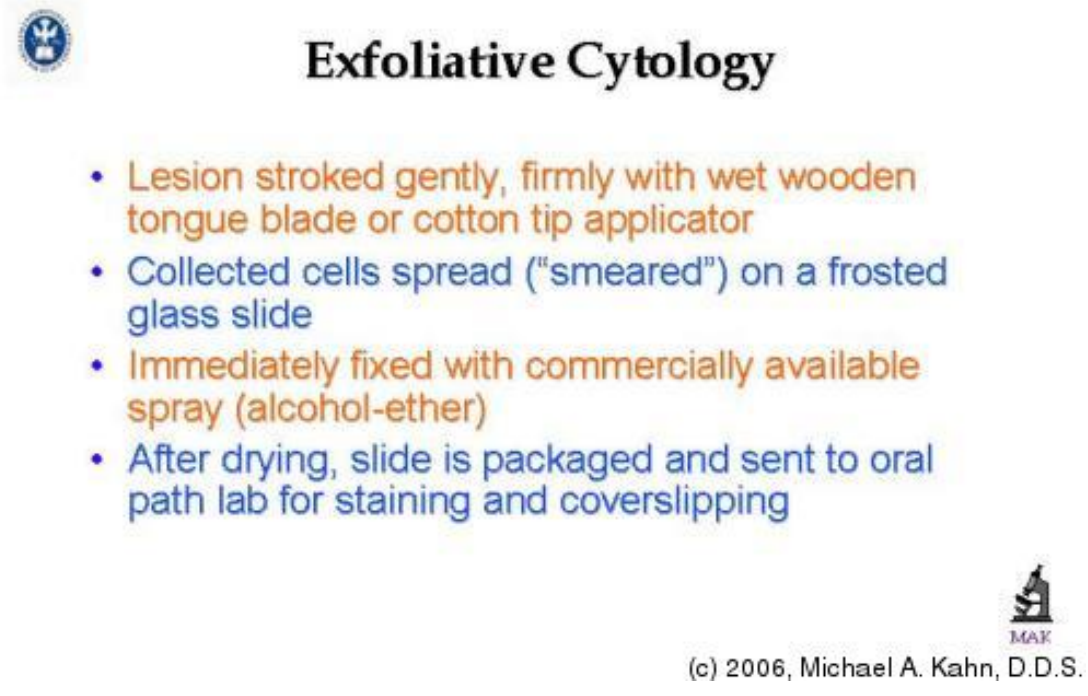
33. Oral Screening and Diagnostic Aids



34. Oral Pathology: Physical Examination: Slide 34

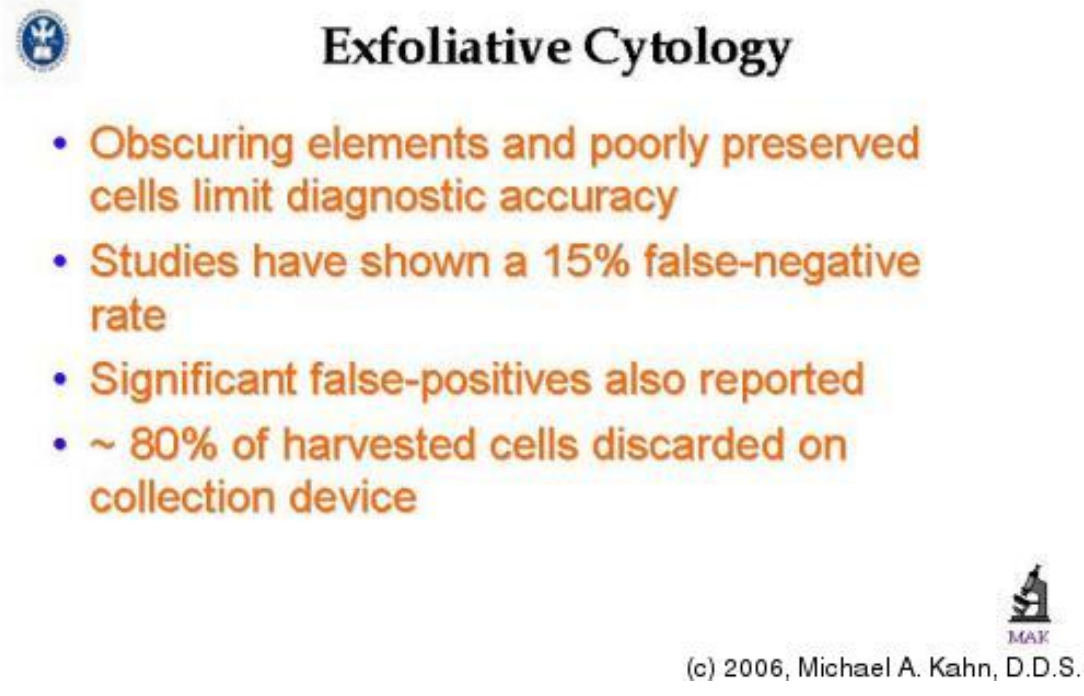


35. Exfoliative Cytology

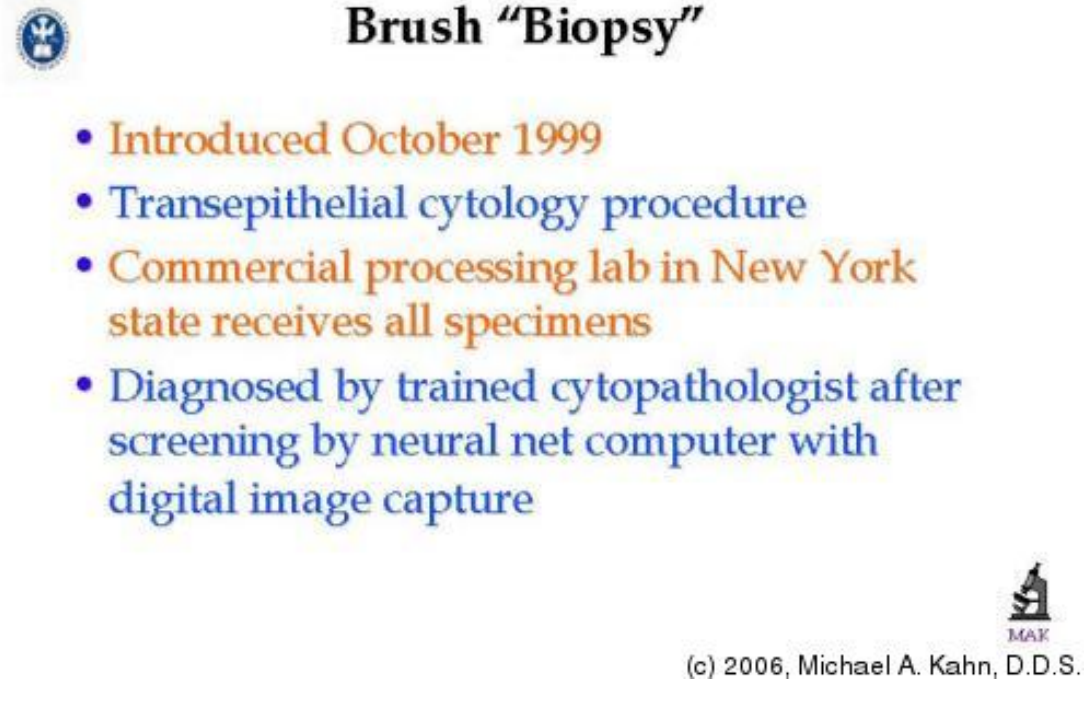


36. Exfoliative Cytology

37. Exfoliative Cytology



38. Brush Biopsy



39. Brush Biopsy

Brush Biopsy

- Transepithelial cell sample obtained by twirling a patented spiral-shaped, stiff nylon bristle brush
- Collected cells transferred to bar-coded, clear glass slide
- Supplied pouch of alcohol fixative is immediately poured over slide
- Specimen mailed in provided box to commercial lab for analysis
- Diagnosis report mailed to clinician

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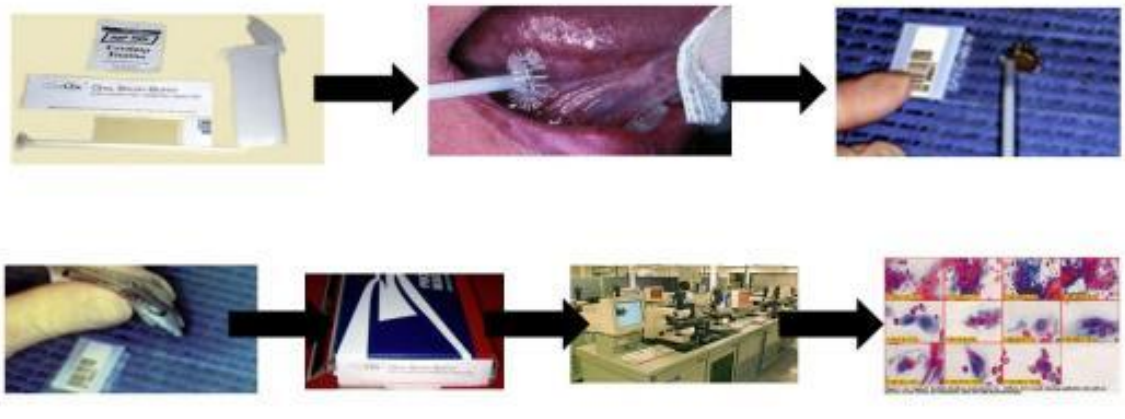
40. Brush Biopsy

Brush Biopsy



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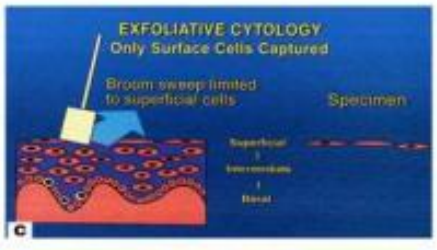
41. Brush Biopsy

Brush Biopsy

- Transepithelial cells harvested
- ~ 80% of harvested cells not transferred to glass slide
- Controversial cost/benefit ratio
  - If positive or suspicious, then biopsy; if negative, but lesion remains then repeat or tissue biopsy



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42. Liquid-Based Cytology

Liquid-Based Cytology

- Past few years, replacing conventional pap smears in hospitals and private OB/GYN offices
- Numerous clinical trials demonstrate superiority over conventional
- FDA-approved and insurance reimbursement

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43. Liquid-Based Cytology

Liquid-Based Cytology

- Transepithelial cells harvested with a nylon bristle brush
- Brush immersed, twirled in liquid preservative container; brush disposed
- Liquid container sent to oral path lab
- Patented machine filters cells from debris and lays cells in a monolayer on glass slide
- Examination by the local oral pathologist following staining and coverslipping

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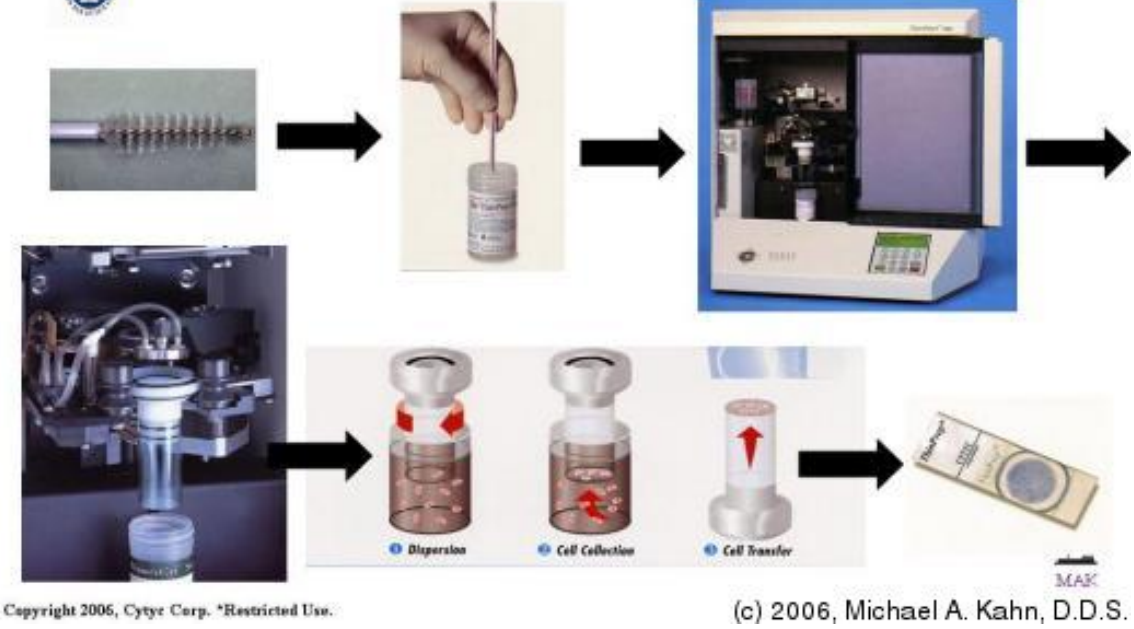
44. Liquid-Based Cytology

Liquid-Based Cytology



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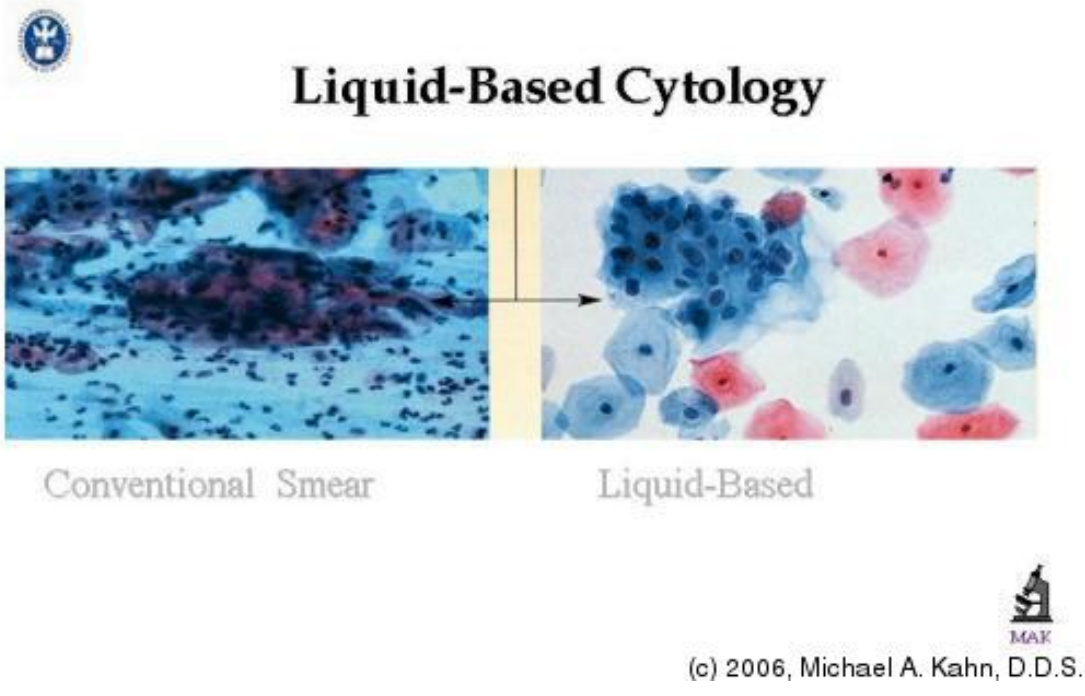
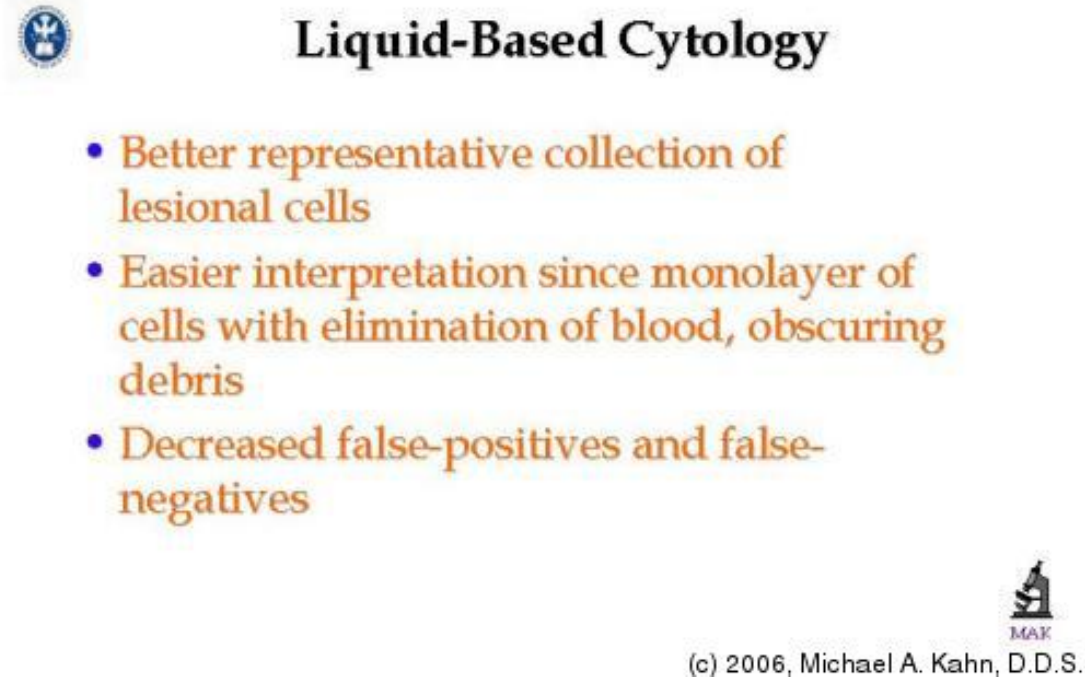
45. Liquid-Based Cytology

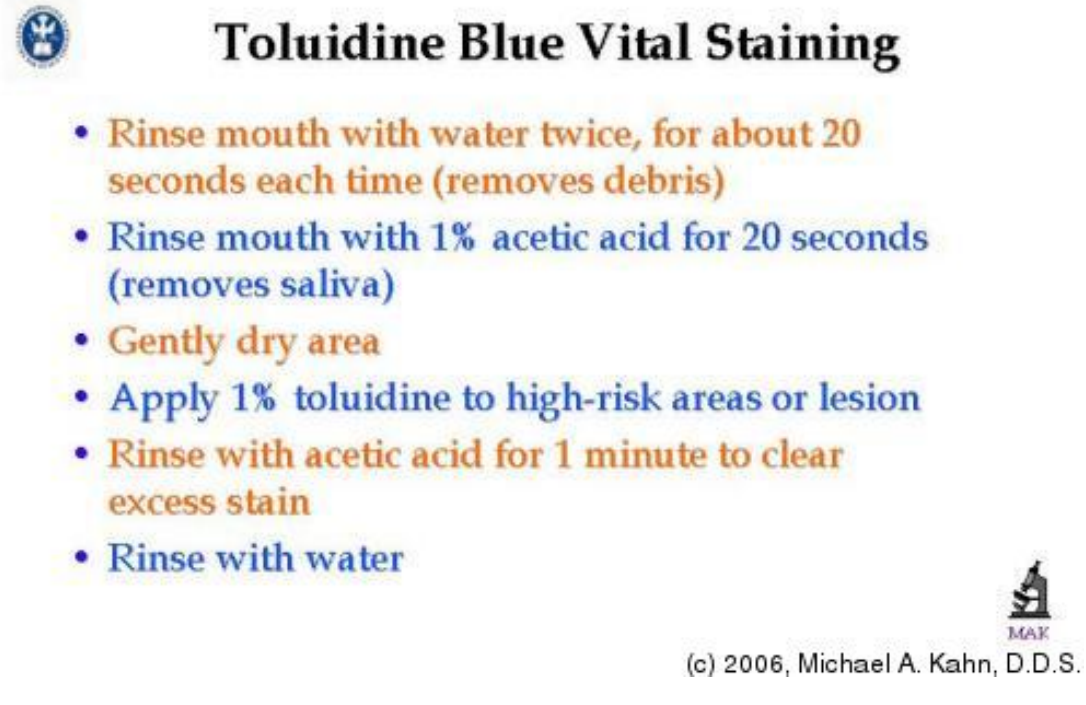


46. Liquid-Based Cytology

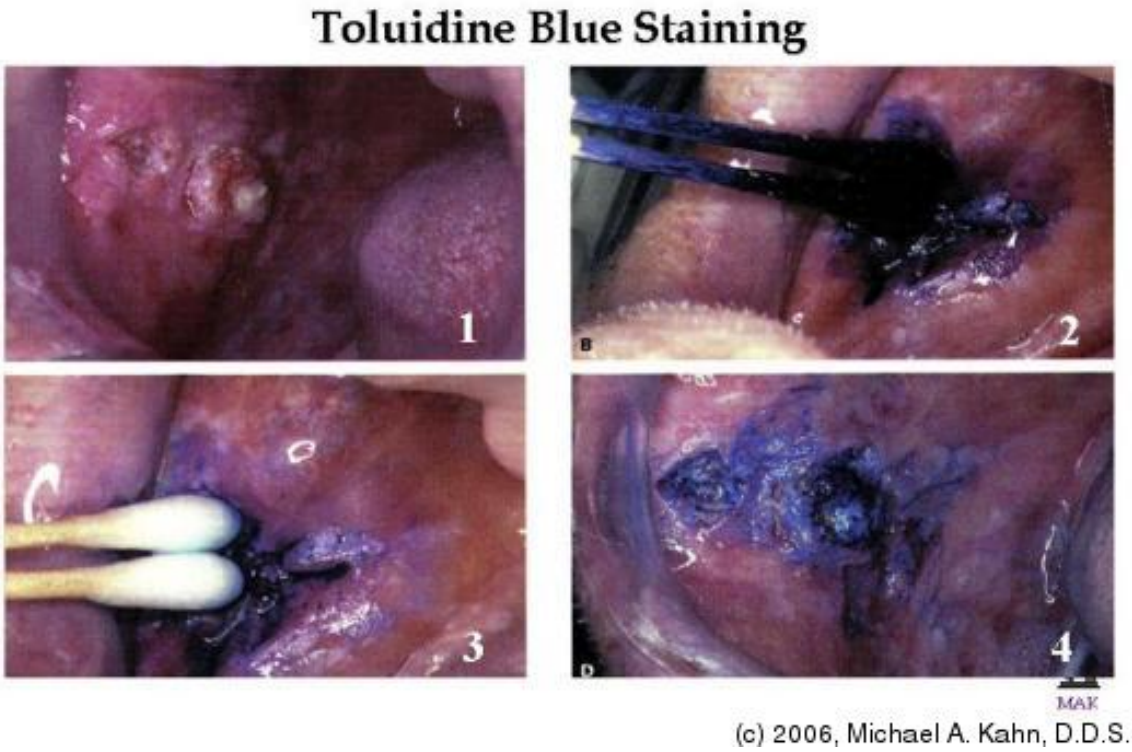


47. Toluidine Blue Vital Staining

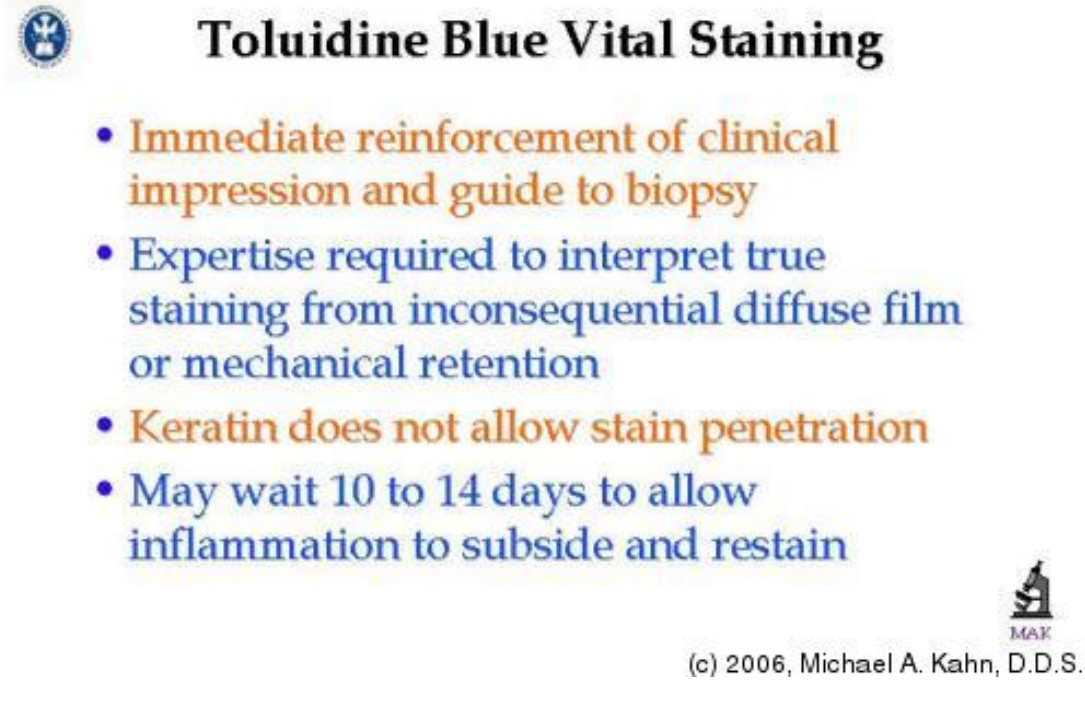
48. Toluidine Blue Vital Staining



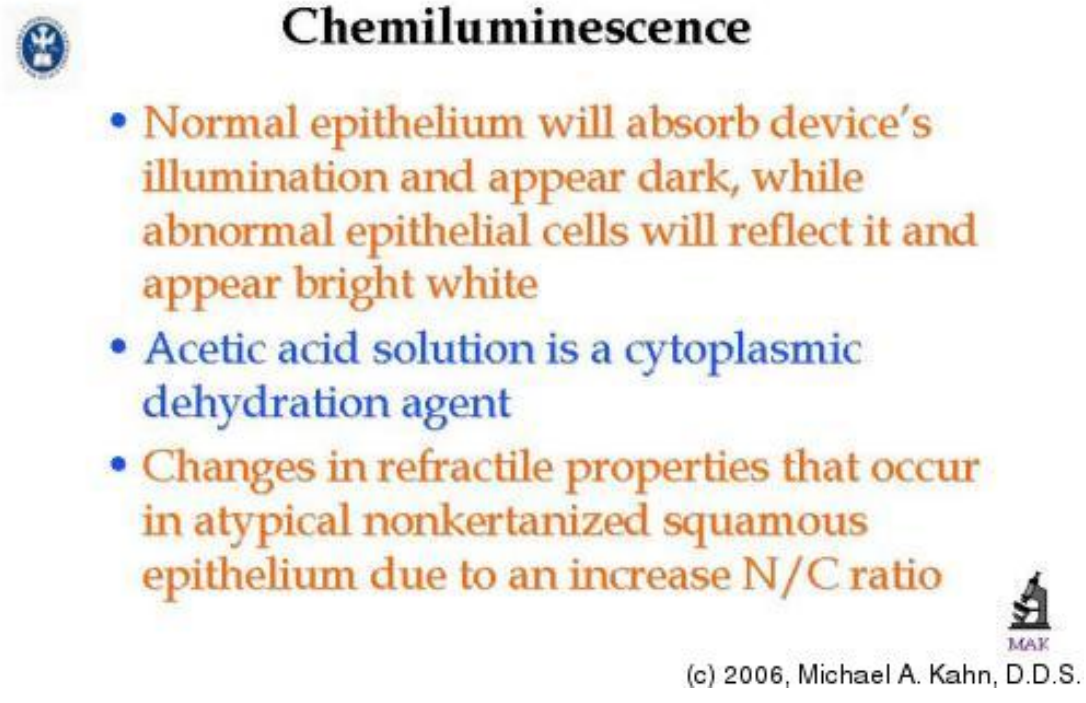
49. Toluidine Blue Staining



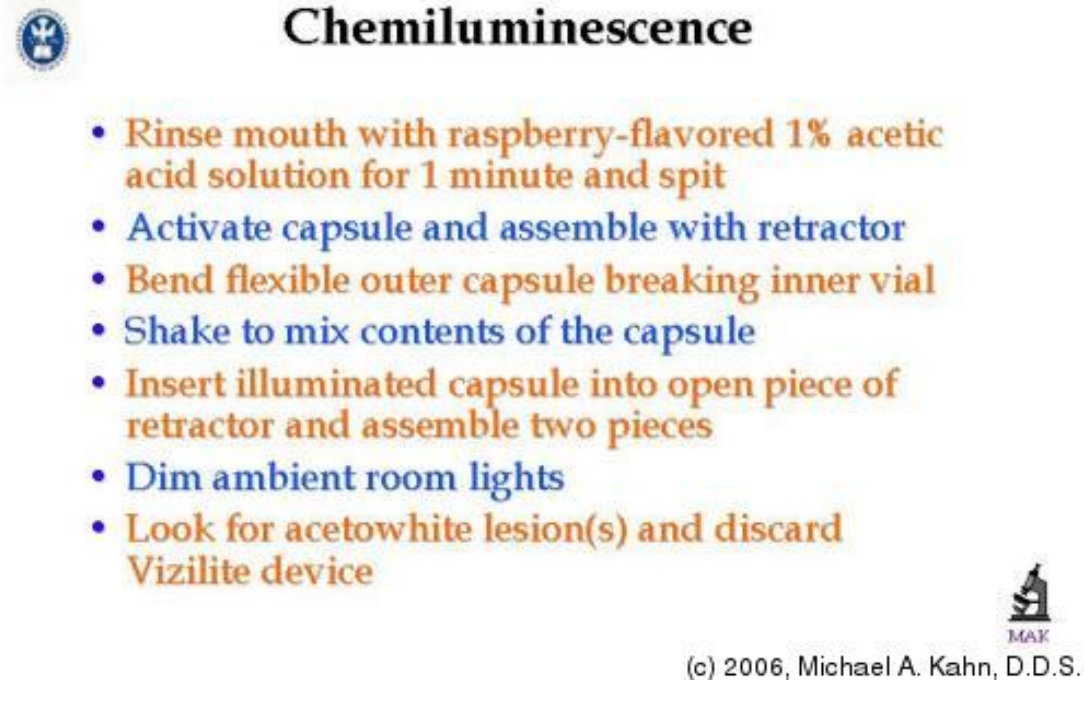
50. Toluidine Blue Vital Staining



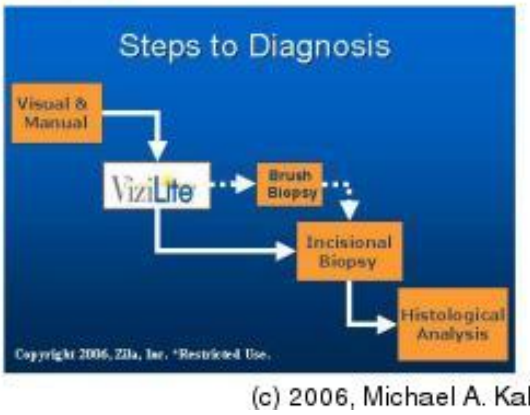
51. Chemiluminescence



52. Chemiluminescence



53. Oral Pathology: Physical Examination: Slide 53



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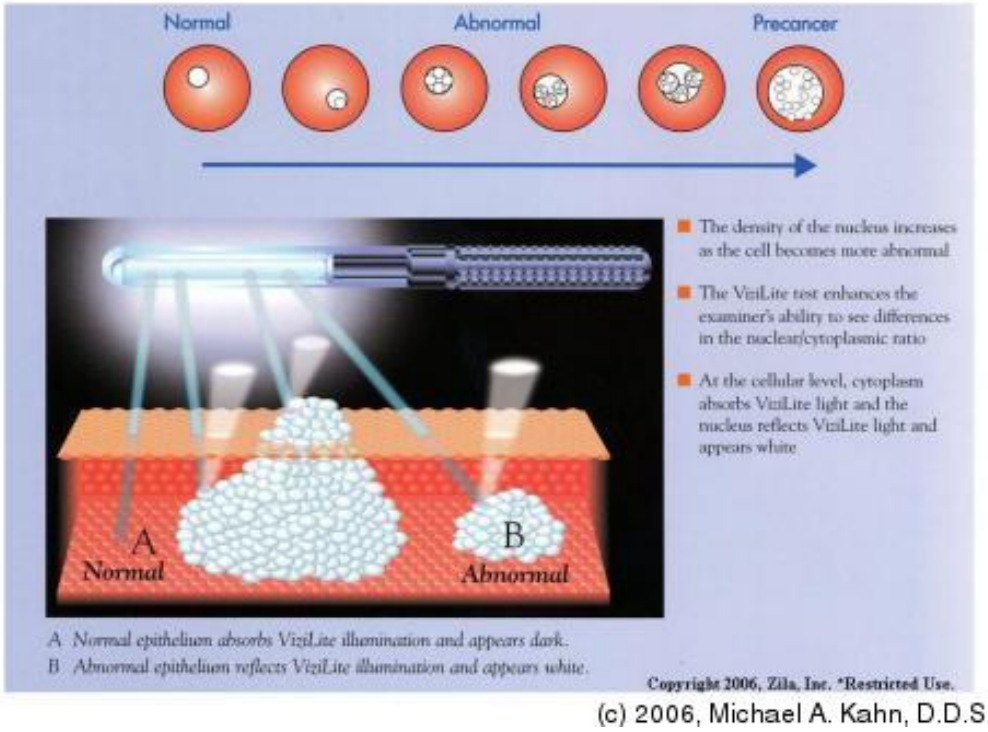
54. Oral Pathology: Physical Examination: Slide 54



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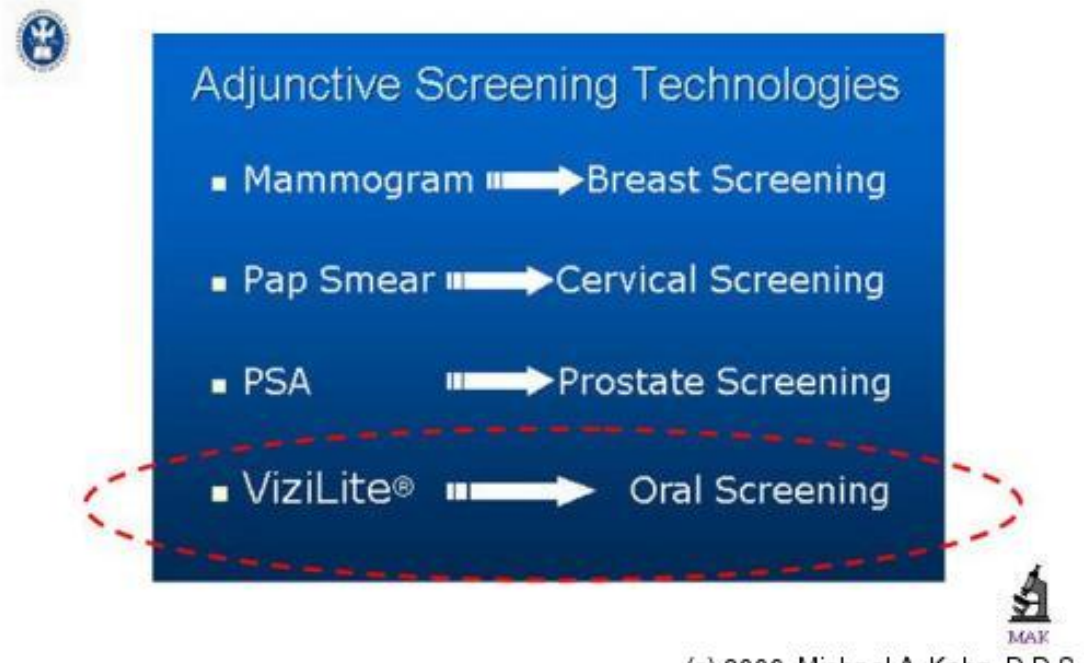
55. Oral Pathology: Physical Examination: Slide 55



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56. Oral Pathology: Physical Examination: Slide 56

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57. Oral Pathology: Physical Examination: Slide 57

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58. Chemiluminescence

Chemiluminescence

- Improves identification, evaluation and monitoring of oral mucosal abnormalities
- Must use within 10 minutes of light activation
- May obtain positive illuminescence of reactive inflammatory lesions

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59. Scalpel Tissue Biopsy

Scalpel Tissue Biopsy

- Introduction
  - The "gold standard" of oral diagnosis
  - Surgical removal of body tissue from the living for pathologic examination
    - Intact orientation and relationship of the removed tissues
  - Indications
    - When a lesion does not respond to therapy
    - When a lesion is suspicious for neoplasia despite negative results with other dx techniques
    - When the clinician is unsure of the clinical diagnosis

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60. Scalpel Tissue Biopsy

Scalpel Tissue Biopsy

- Technique
  - Appropriate local anesthesia injected adjacent to the suspicious lesion
  - Traction suture placed for ease of cutting and retention of specimen
  - Scalpel blade (e.g., #15 or #12) used to incise tissue in an elliptical outline with a V-shaped cross-section
  - Specimen immediately placed in 10% neutral buffered formalin, tissue-side down on a piece of paper
  - Suture(s) placed to promote primary intention wound healing, when possible

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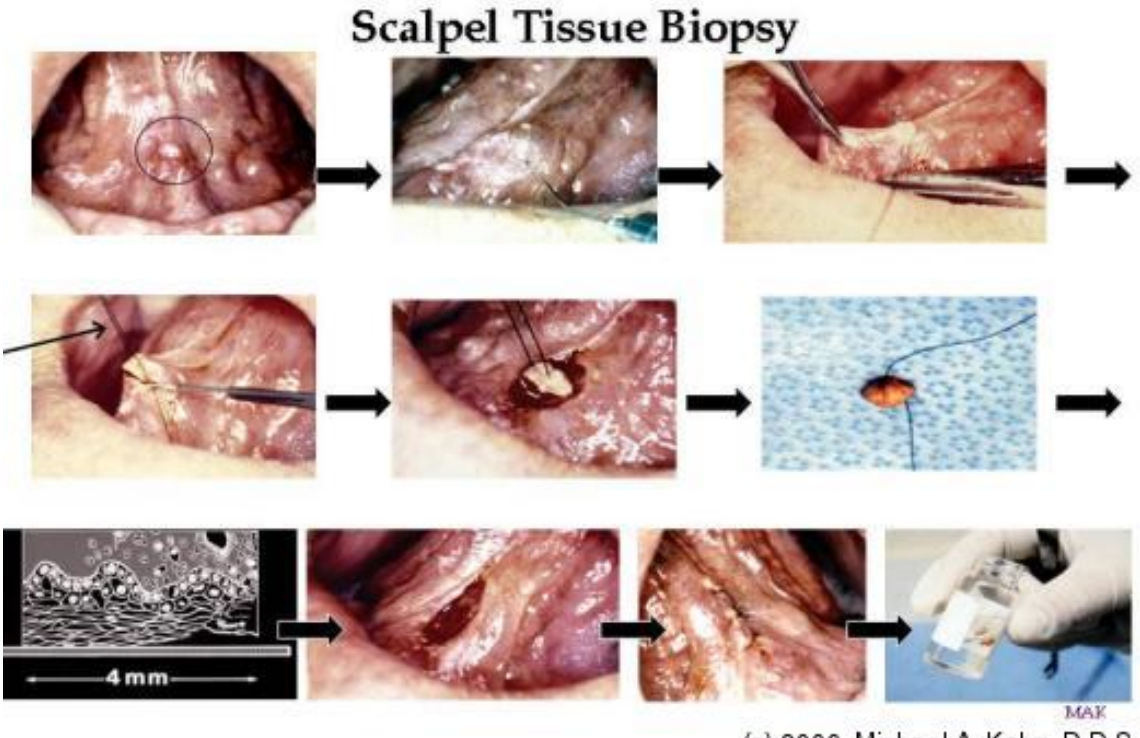
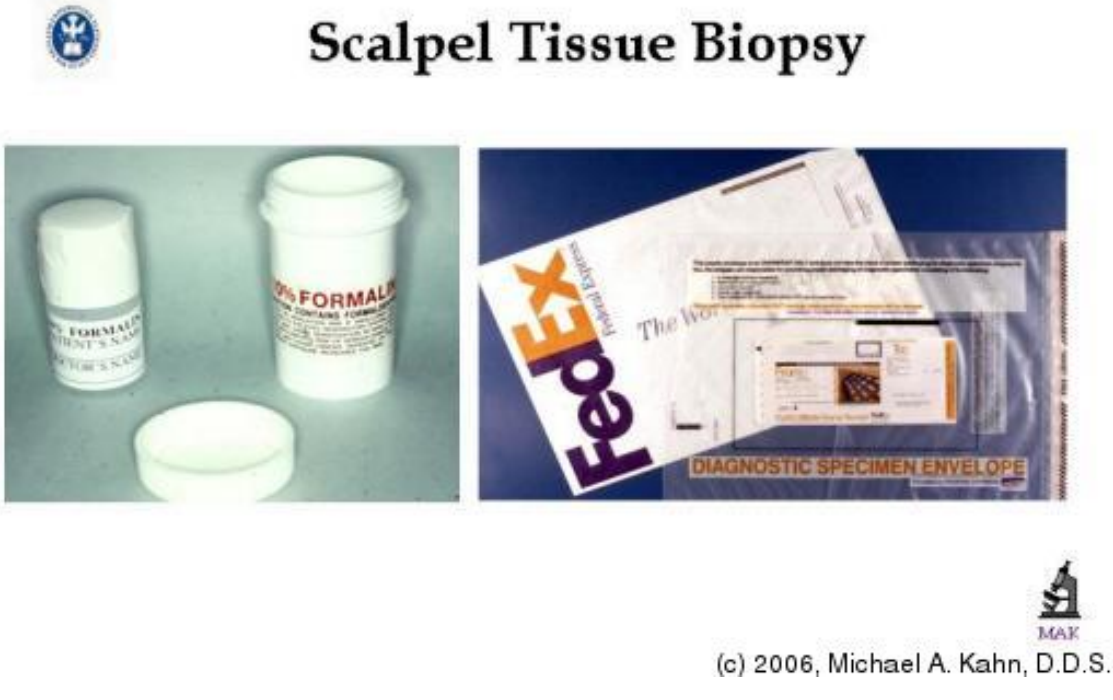
61. Scalpel Tissue Biopsy



62. Scalpel Tissue Biopsy



63. Scalpel Tissue Biopsy

Scalpel Tissue Biopsy – Technical Considerations

- Small lesions should be completely excised
- Large lesions that are incompletely removed incised must include a border of clinically normal tissue (i.e., perilesional)
- Local anesthesia should not be injected into the area to be biopsied (artifact creation)
- Fixation in 10% neutral buffered formalin should be immediate and should completely bathe the specimen
  - Alcohol may be used for fixation as a poor second choice
  - ❖ Never use water or saline (artifact creation)

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64. Scalpel Tissue Biopsy

Scalpel Tissue Biopsy – Technical Considerations

- Attach traction suture for soft tissue retraction rather than clamping mucosa
- Tissue should be handled gently, not crushed with tissue forceps
- Retain suture in specimen once excised and indicate its position for orientation at gross examination by pathologist
- Multiple biopsies from different sites should be submitted in separate containers to allow discrimination if diagnoses different
  - If separate containers are not available then indicate with different length sutures

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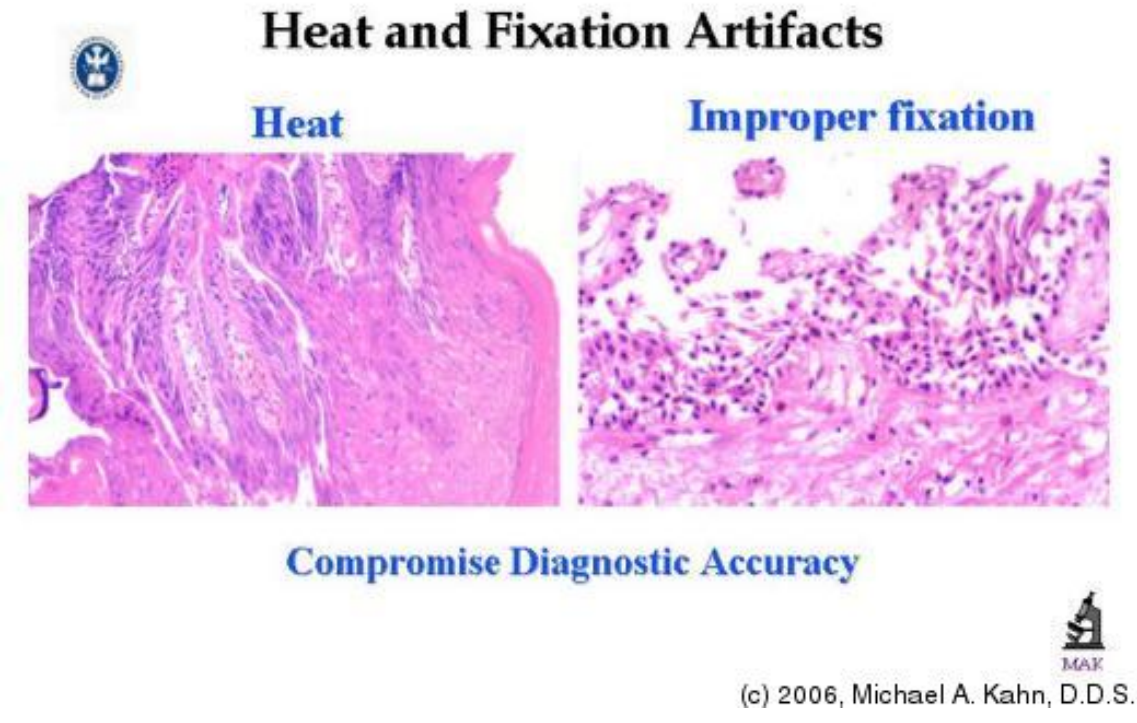
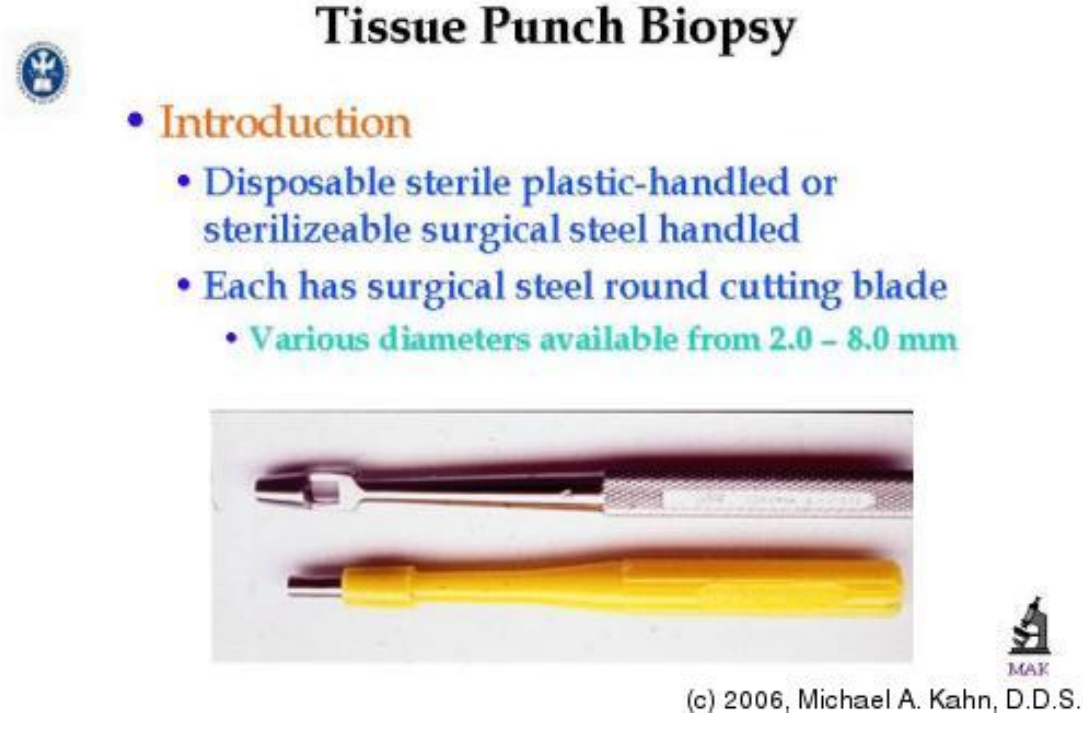
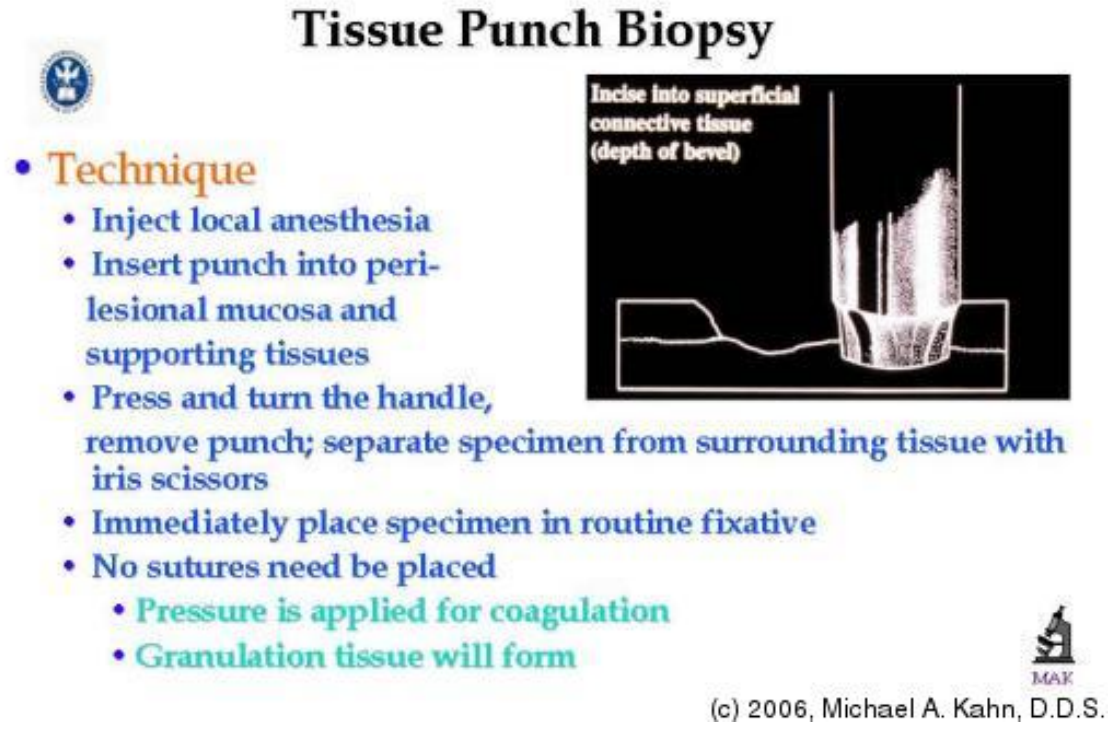
65. Heat and Fixation Artifacts



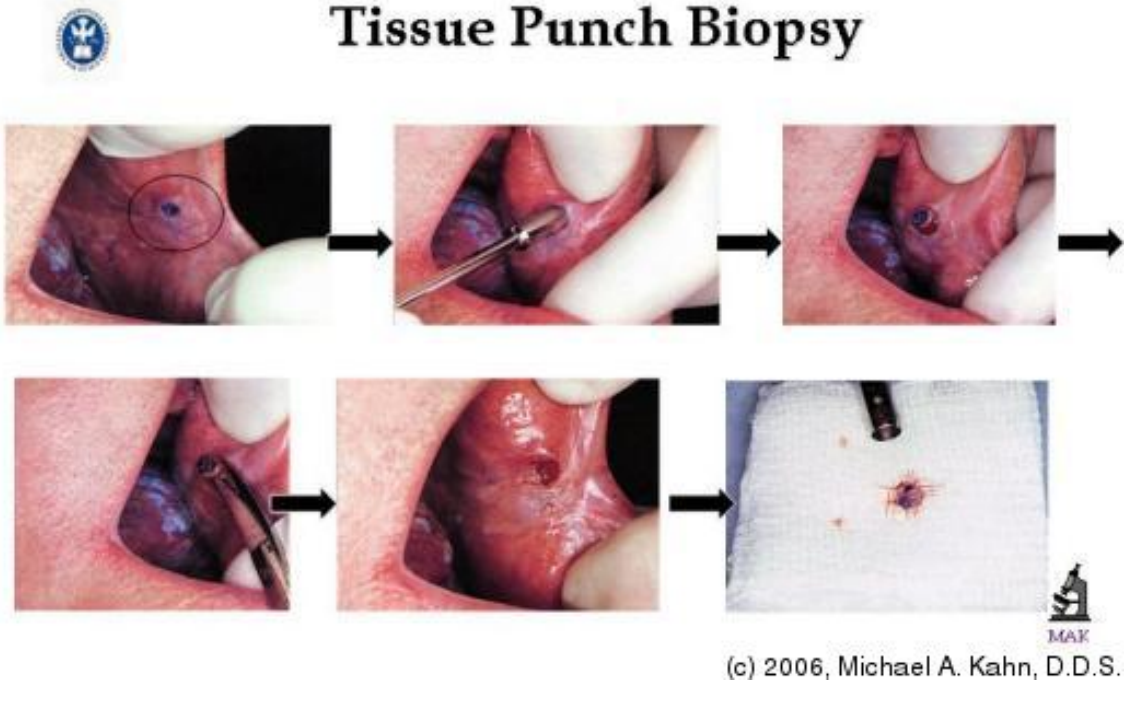
66. Tissue Punch Biopsy



67. Tissue Punch Biopsy



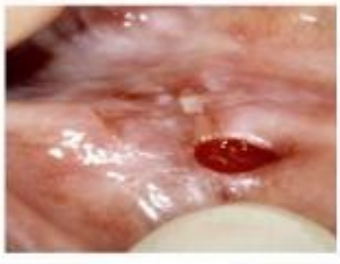
68. Tissue Punch Biopsy



69. Tissue Punch Biopsy

Tissue Punch Biopsy

- Indications and Advantages
  - Small lesions
  - Easier than scalpel
  - Sutures not needed
- Limitations
  - Limited number of anatomic sites suitable
  - Generally, for incisional biopsy only



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70. Laser Soft Tissue Biopsy

Laser Soft Tissue Biopsy

- Hydrolaser
  - Laser Medium: Er,Cr:YSGG
    (Erbium, Chromium, Yttrium, Scandium, Gallium, Garnet)
  - Wavelength = 2780 nm
- Advantages
  - No anesthesia
  - No blood

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71. Oral Pathology: Physical Examination: Slide 71