

PATHOLOGY AND ORAL DISEASE

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I. CLINICAL ORAL PATHOLOGY:

The structures of the jaws, mouth, tongue and throat reflect the disease conditions manifested by the systemic human whole: Be aware that the mouth and tongue are windows, indicators to the status of systemic function of the human body.

- a. Anemia is often heralded by "Burning Tongue Syndrome"
- b. Aphthous ulcers "canker sores" are the first signs of the onset of female hormones and menses in 10-11-12 year old girls.
- c. Liver dysfunction will manifest clinically as a buccal mucosa "lichenoid" reaction mimicking Oral Lichen Planus (OLP).
- d. Cyclosporin, Procardia, Cardizem and Dilantin medications will cause the development of gingival first sign of the hyperplasia (which may result in a recurring \$5000.00 periodontal surgery bill.)
- e. The first clinical signs of AIDS are oral thrush, oral herpes and White hairy leukoplakia. (a CBC would reveal a CD4 count of 200 to 500).
- f. Systemic fevers will lead to "fever blisters" and viral colds will lead to "cold sores"
- g. Oral ulcerations are the onset of Chron's Disease, ulcerative colitis, and irritable bowel syndromes.

There are over three hundred different disease entities of the oral cavity. Regardless of etiology, the mouth manifests clinical pathology in consistent sets of clinical patterns: ulcers, keratosis, swelling, vesicles or combinations of the listed. Radiographic manifestations will be fractures, radiolucencies and radiopacities.

KEY POINTS:

- a. A patient with significant (and potentially life threatening) oral infections will often have a normal CBC.
- b. The most important radiograph an MD can request to assist the DDS is a panorex radiograph. Labs are: CBC, SMAC, INR, and Vitamins.
- c. The panorex will show all sinus, maxillary bones, mandibular bones, zygoma, and part of the cervical vertebral column.

Dentistry is a system of health care with 10 specialties. DDS doctors provide care through oral and maxillofacial surgery, periodontal surgery, oral medicine, hospital dentistry, oral and maxillofacial pathology, maxillofacial prosthodontics for craniofacial defects, root canal care (endodontics), public health, and general dentistry. If you remain on hospital staff and or enter private practice get to know the dental staff and several dental doctors.

II. CURRENT TRENDS:

The American Academy of Periodontology has reclassified the disease entities in the Oral Cavity (see Armitage paper). Be aware that the DDS will be treating over 300 types of disease conditions and may need to consult with you to the medical ramifications of some of the conditions.

FUNDAMENTALLY, the two primary factors that contribute to oral disease are SMOKING AND DIABETES followed by medications, stress and genetics.

III. DISEASES GROUPINGS:

A. VIRAL: (“fever blisters, cold sores”),

Acute Herpetic Gingivostomatitis: acute herpetic gingivostomatitis with oral mucosal ulcers.

MICRO: HSV1 or HSV2 virus

TX: Anti-viral medications.

Chicken pox- This facial view shows a child with chicken pox, which is caused by the varicella virus.

HX: usually self-limiting in children, forms Herpes Zoster in adult (shingles).

MICRO: VZV (Varicella zoster virus) causes chicken pox and is related to Herpes.

TX: Anti-virals PRN.

Condyloma- This slide shows a condyloma in a 6-year-old child.

MICRO: HPV (human papilloma virus).

TX: anti-viral creams, cryotherapy. Do not use lasers.

Coxsackie viruses Infection (Herpangina)-Vesicles are present on the soft palate.

MICRO: a Picornavirus (not Herpes) called Coxsackie virus

TX: Supportive

Hairy leukoplakia- This is a condition that characteristically involves the lateral borders of the tongue. It is seen almost exclusively in human immunodeficiency disease (HIV)-seropositive patients.

MICRO: Epstein-Barr virus was found in the lesion.

TX: Antiviral therapy. HIV.

Mononucleosis- This disease is caused by the Epstein-Barr virus. Oral mucosal petechiae are sometimes seen in patients with mononucleosis.

MICRO: EBV

TX: supportive

B. HORMONAL

Necrotizing Periodontal Diseases

Clinical picture showing punched out papillae, which are characteristic of this gingival condition.

HX: Smoking, elevated cortico-steroids from physical/mental stress, poor oral hygiene.

MICRO: Spirochetes, bacteroides

TX: RP and S, antibiotics, smoking cessation, stress reduction, life style changes.

ANUG-Clinical picture of the posterior area.

Pregnancy tumor-A tumor that is histologically the same as a pyogenic granuloma and is a reactive inflammatory lesion. This patient exhibits a pregnancy tumor on the tongue.

TX: Treat, as needed, ideal therapy after lactation has ceased.

Recurrent Aphthous Ulcers (RUA)- These ulcerations are characteristic of recurrent aphthous stomatitis.

C. FUNGAL

Angular cheilitis- This condition is most often bilateral. The ulcerated, crusted, erythematous area of the right commissure is most often caused by *Candida*.

MICRO: Candidiasis

TX: Anti-fungal , Diflucan, Nystatin,

Black Hairy Tongue- This condition is characterized by the elongation of the filiform papillae, which affects the dorsal surface of the tongue anterior to the circumvallate papillae. This clinical picture shows the black to brown discoloration caused by chromogenic bacteria.

MICRO: often fungus overgrowth.

TX: Tongue brushing, increased oral hygiene, anti-fungal prn.

Papillary hyperplasia- This condition is also referred to as pseudopapillomatosis. It results from irritation to the palate from an ill-fitting denture. This clinical view shows glistening red papillary projections.

MICRO: Usually *Candida*

TX: new denture (?), anti-fungals. Thrush

D. BACTERIAL:

Chancre- The lesion of primary syphilis of the tongue and secondary syphilis of the hands and palate.

HX: Syphilis remains a significant infectious disease.

MICRO: ***Treponema pallidum***

TX: Antibiotics

FISTULA- (also parulis or sinus tract):-

Gingivitis-

Periodontitis-

TB-Solitary painless ulcer on top of tongue.

HX: Bacterium

TX: Antibiotics

E. DERMATOLOGICAL:

Allergy- This condition consists of a hypersensitive reaction acquired through exposure to a particular allergen. This series shows edema of the gingival (do to toothpastes), eyelids (associated with an allergic reactions to a cat and clinical picture of the lips showing edema that resulted from penicillin allergy.

Chemical burns- This condition occurs when an exogenous chemical (aspirin, Clorox, nitroglycerin) is placed again on the mucosal tissues. The chemical causes sloughing and necrosis of the epithelial tissue. In this clinical picture, the white area on the buccal mucosa resulted from an aspirin that was placed in the area.

TX: remove aspirin.

Erythema multiforme- This condition affects the skin and oral tissues. Skin lesions have a characteristic "bull's-eye" or target appearance. This clinical view shows erythema multiforme on the hand. Oral clinical characteristics of this condition include crusting and ulceration of the lips and ulceration and erythema to varying degrees on the mucosal tissues involved. This clinical picture shows erythema multiforme affecting the lips and buccal mucosa.

Geographic tongue (migratory glossitis, oral psoriasis)-In this patient, the dorsal and lateral borders of the tongue are affected. Red patches are seen as a result of a lack of filiform papillae, and these patches are surrounded by a yellow or white border. When the filiform papillae

regenerate, the area returns to normal. However, another area will begin to break down, and the filiform papillae will be destroyed.

HX: some authors feel a variant of psoriasis.

TX: palliative.

Lichen planus- This condition commonly affects the mucous membranes (as well as other tissues! of the oral cavity, and oral lesions can appear prior to the skin eruptions. There are several forms or types of lichen planus. This patient's buccal mucosa showed a white plaque-like pattern. The characteristic white, lace-like pattern is seen on the buccal mucosa of this patient with lichen planus is known as Wickham's striae. This patient exhibited erosive lichen affecting the buccal mucosa and lateral border of the tongue. Low-power microscopic examination reveals orthokeratotic stratified squamous epithelium covering fibrous connective tissue. The epithelium exhibits elongated rete ridges, and the inflammatory cells in the connective tissue are located near the epithelium.

HX: always rule out Hepatitis and liver disease first.

TX: topical steroids

Pemphigoid (benign mucous membrane Pemphigoid- This condition is an autoimmune disease characterized by sub epithelial bullae formation that affects mucous membranes, including the oral cavity. It is also referred to as cicatricial pemphigoid, since scarring can result during the healing process. The appearance of the gingiva here is called desquamative gingivitis.

TX: Biopsy and steroids.

Pemphigus vulgaris- This is another autoimmune disease; however, in this condition, the lesions are intraepithelial. Note the ulceration on the mucosa and the inflamed gingiva.

HX; very serious, potentially fatal skin disease.

TX: Biopsy and Oral Medicine or Dermatology.

Recurrent Aphthous Ulcers (RUA)- These ulcerations are characteristic of recurrent aphthous stomatitis.

F. PHARMACEUTICAL: all pharmaceuticals have oral side effects in some manner ranging from xerostomia to lichenoid reactions to hyperplasias.

CLASSICS:

Dilantin

Cyclosporin

Calcium channel blockers

G. SYSTEMIC DISEASE

DIABETES: the number two source of oral disease conditions. Micro vasculature damage of the periodontal tissues, dental pulp and nerves.

Hepatitis-Clinical picture of the ventral surface of the tongue showing pallor and a yellow tone associated with alcoholic hepatitis with jaundice.

HX: yellow tint to tissues, eyes, and skin.

TX: medical work-up.

Iron deficiency anemia-Oral manifestations of iron deficiency anemia include angular cheilitis and a smooth, red tongue with atrophy of the papillae.

TX: medical, B vitamin shots, iron

Vitamin deficiency- This smooth, dark red tongue resulted from a deficiency of the B-complex vitamins. Diabetes

H. GROWTHS:

Exostoses- These are nodular projections of dense compact bone on the buccal and labial aspects of the maxilla or mandible, or both. Note the prominent exostoses in this patient.

Fibroma-A benign lesion with a smooth surface that is thought to be traumatically induced is called a fibroma. It is most often found near the occlusal plane. This patient has a fibroma of the gingiva. It has a sessile base and is seen in the area of the maxillary lateral and cuspid teeth. Low-power microscopic examination of an irritation fibroma reveals stratified squamous epithelium covering a core of fibrous connective tissue. Blood vessels are seen in the connective tissue.

Gingival hyperplasia-Proliferation of the gingival tissues resulting from medications and local irritants associated with periodontal disease is called gingival hyperplasia.

TX: remove medications and or surgery.

Mucocele- This fluid-filled lesion is most commonly seen on the mucosa inside the lower lip. It is filled with salivary gland fluid and ruptures easily. This patient has a mucocele inside the lower lip a few millimeters from the commissure. Low-power microscopic examination reveals a cyst-like structure close to the surface of the epithelium. Some mucin is seen in the lumen. Granulation tissue containing mucin is seen in the subjacent area of the connective tissue. A salivary gland lobule is also present.

Melanoma

Odontoma (complex)- This is a benign structure comprised of tooth structures that have been laid down in a manner in which tooth anatomy cannot be identified. This radiograph shows a complex odontoma observed here as a radiopaque area at the apex of the maxillary central incisor, reveals irregular masses of tubular dentin and enamel matrix.

Odontoma (compound)- This condition is a mixture of ameloblasts and odontoblasts laid down in an organized fashion in which there is more of a resemblance to a tooth. This radiograph shows a radiopaque structure between the roots of the maxillary premolars, which was diagnosed as a compound odontoma. Grossly, the odontoma contains small tooth-like structures. A medium-power microscopic examination reveals discrete structures composed primarily of tubular dentin, one of which contains a central area of pulp tissue. The enamel rods dissolve when the specimen is decalcified so that it can be sectioned. However, the basophilic fibrillar material that is the protein matrix of the enamel rods remains after decalcification.

PAPILLOMA- This is a benign, slow-growing growth of papillary projections with a "cauliflower-like" surface that is usually white. It can be found anywhere intra-orally. This patient has a papilloma on the posterior portion of the palate.

MICRO: PAPOVAVIRUS family PAPILLOMA VIRUS (not herpes)

TX: laser, chryotherapy, chemical.

I. PSYCHIATRIC DISORDERS:

Anorexia nervosa (bulimia)- This disorder is associated with self-induced vomiting in which the gastric acids cause erosion of the dentition. Anterior clinical picture of a patient with anorexia nervosa. Note the decrease in size of the anterior teeth. Erosion is seen on the lingual aspect of the maxillary anterior teeth.

HX; psychiatric and inappropriate "body image" issues, very difficult to cure, can lead to death.

TX: Medical and psychiatric care, prosthetic dental care.

Necrotizing Periodontal Diseases

Clinical picture showing punched out papillae, which are characteristic of this gingival condition.

HX: Smoking, elevated cortico-steroids from physical/mental stress, poor oral hygiene.

MICRO: Spirochetes, bacteroides

TX: RP and S, antibiotics, smoking cessation, stress reduction, life style changes.

ANUG-Clinical picture of the posterior area.

Burning Mouth/Tongue and Atypical Trigeminal (“Ghost”) Neuralgia- 50% of all patients are documented to be clinical depressed.

J. CANCER

Ameloblastoma-Radiograph of an ameloblastoma. This tumor is most commonly found in the mandibular molar region near the ramus. This patient also had a dentigerous cyst. This odontogenic tumor is composed of islands of epithelial cells that infiltrate fibrous connective tissue. Prominent, polarized, and palisaded cells are seen at the periphery of the tumor islands. The central portion of the islands resembles the **stellate reticulum**.

HX: long standing impacted wisdom teeth.

TX: Oral surgery evaluation and removal

Carcinoma-A malignant tumor of epithelium is a carcinoma.

This clinical picture shows a malignant epithelial salivary gland tumor of the tongue (adenoid cystic carcinoma),

basal cell carcinoma near the ala of the nose,

carcinoma metastatic to the jaws,

carcinoma metastatic to the jaws.

Low-power microscopic view of a squamous cell carcinoma reveals islands and strands of neoplastic epithelial cells, which are seen infiltrating the fibrous connective tissue.

HX: 90% of all malignancies of the oral cavity are squamous cell carcinoma. 30,000 new cases each year with 9,000 deaths per year. Five year survival rate remains below 50%. Most all are associated in some way with smoking. Squamous

Hyperkeratosis-low-power microscopic examination reveals orthokeratotic stratified squamous epithelium covering fibrous connective tissue. A granular layer is present in the epithelium when it is covered by orthokeratin .

Kaposi's sarcoma of the skin- This is a vascular malignancy that frequently Occurs in patients with acquired immunodeficiency disease (AIDS). This patient had a lesion on the skin near the ear.

MICRO: Herpes 8 virus found in these lesions

K. GENETICS:

Amelogenesis imperfecta- This is a hereditary condition affecting the enamel formation of both dentitions. There are different types of amelogenesis imperfecta and therefore different ranges of clinical appearances. This clinical pictures show teeth affected with pitted Autosomal-dominant amelogenesis imperfecta, showing multiple pits on the labial surface. Other slides show snowcapped amelogenesis imperfecta, showing uniform whitening of incisal edges, more dramatic pitting, brown-yellow appearance of the enamel and Radiograph showing the lack of enamel A.

HX: usually genetic in origin, can be developmental, sometimes environmental.

TX: dentin bonding materials or full coverage prosthetics.

Commissural lip pit and Median lip pits- This developmental anomaly is an epithelial-lined tract that may vary in depth. This clinical view shows lip pits.

Dentinogenesis imperfecta- This condition is an inherited Autosomal dominant disorder in which there is abnormal development of the odontoblasts. The teeth have a characteristic brown-blue or opalescent hue. The deciduous teeth are more severely affected. The opalescent bluish hue to brownish opalescent hue in patient's teeth is characteristic of dentinogenesis imperfecta.

Fissured (scrotal) tongue- This condition is considered a variant of normal and is characterized by deep grooves on the dorsal surface of the tongue.

TX: none

Geographic tongue (migratory glossitis)-In this patient, the dorsal and lateral borders of the tongue are affected. Red patches are seen as a result of a lack of filiform papillae, and these patches are surrounded by a yellow or white border. When the filiform papillae regenerate, the

area returns to normal. However, another area will begin to break down, and the filiform papillae will be destroyed.

HX: some authors feel a variant of psoriasis.

TX: palliative.

1. Acute necrotizing ulcerative gingivitis (ANUG, now NPD):

Clinical picture showing punched out papillae, which are characteristic of this gingival condition.

HX: Smoking, elevated cortico-steroids from physical/mental stress, poor oral hygiene.

MICRO: Spirochetes, bacteroides

TX: RP and S, antibiotics, smoking cessation, stress reduction, life style changes.

ANUG-Clinical picture of the posterior area.

2. Acromegaly:

This clinical picture shows mandibular prognathism, which is one of the characteristic features of the condition.

HX: condition caused by hypersecretion of a growth hormone.

MICRO: none known.

TX: Medical work-up for growth hormone levels, surgery to remove tumor if present.

Clinical picture showing macroglossia, which is another characteristic feature of this condition.

3. Agranulocytosis: This clinical picture shows lesions on the buccal mucosa associated with this disease.

HX: Marked decrease in the number of granulocytes, particularly neutrophils.

MICRO: None known.

TX: Medical work-up for growth hormone levels, surgery to remove tumor if present.

Medical work-up for growth hormone levels, surgery to remove tumor if present.

4. Acute Herpetic Gingivostomatitis-series of slides showing clinical picture of acute herpetic gingivostomatitis with oral mucosal ulcers.

MICRO: HSV1 or HSV2 virus (many others possible).

TX: Anti-viral medications.

5. Alcoholic Hepatitis-Clinical picture of the ventral surface of the tongue showing pallor and a yellow tone associated with alcoholic hepatitis with jaundice.

HX: yellow tint to tissues, eyes, skin.

TX: medical work-up.

6. Allergy- This condition consists of a hypersensitive reaction acquired through exposure to a particular allergen. This series shows edema of the gingival (do to toothpastes), eyelids (associated with an allergic reactions to a cat and clinical picture of the lips showing edema that resulted from penicillin allergy).

HX: rash, swollen lips, eyes, throat, airway constriction.

TX: identify allergen and remove form oral cavity.

7. Amalgam tattoo- amalgam tattoo's occur anywhere there is an injection of metal debris following dental procedures. A history pertaining to the cause can be secured from the patient, since there were no amalgam restorations in the area. The patient had a root canal procedure on her deciduous tooth. Colors range from blue-black to brown. Radiographs will sometimes show particles of amalgam in the tissue (radiopaque areas). Microscopic view showing stratified squamous epithelium covering fibrous connective tissue in which black granular material is seen. The black granular material is amalgam.

HX: previous dental work, trauma, self inflicted wounds.

TX: cosmetic

8. Ameloblastoma-Radiograph of an ameloblastoma. This tumor is most commonly found in the mandibular molar region near the ramus. This patient also had a dentigerous cyst. This odonto-

genic tumor is composed of islands of epithelial cells that infiltrate fibrous connective tissue. Prominent, polarized, and palisaded cells are seen at the periphery of the tumor islands. The central portion of the islands resembles the **stellate reticulum**.
 HX: long standing impacted wisdom teeth.
 TX: Oral surgery evaluation and removal

9. Amelogenesis imperfecta- This is a hereditary condition affecting the enamel formation of both dentitions. There are different types of amelogenesis imperfecta and therefore different ranges of clinical appearances. This clinical pictures show teeth affected with pitted Autosomal-dominant amelogenesis imperfecta, showing multiple pits on the labial surface. Other slides show snowcapped amelogenesis imperfecta, showing uniform whitening of incisal edges, more dramatic pitting, brown-yellow appearance of the enamel and Radiograph showing the lack of enamel.

HX: usually genetic in origin, can be developmental, sometimes environmental.
 TX: dentin bonding materials or full coverage prosthetics.

10. Angular cheilitis- This condition is most often bilateral. The ulcerated, crusted, erythematous area of the right commissure is most often caused by Candida.

MICRO: Candidiasis
 TX: Anti-fungal , Diflucan, Nystantin,

11. Ankyloglossia- This condition consists of extensive adhesion of the tongue to the floor of the mouth or the lingual aspect of the anterior portion of the mandible caused by short lingual frenum. This anterior view of a young child shows a very short frenum.

HX: genetic/developmental.
 TX: Surgery PRN.

12. Ankylosis- This term describes a tooth that is fused to surrounding bone preventing exfoliation. Retained deciduous teeth are particularly affected This radiograph shows a retained deciduous molar that is ankylosed.

HX: Trauma or (occasionally associated with Endodontic care).
 TX: Extraction prn.

13. Anorexia nervosa (bulimia)- This disorder is associated with self-induce vomiting in which the gastric acids cause erosion of the dentition. Anterior clinical picture of a patient with anorexia nervosa. Note the decrease in size of the anterior teeth . Erosion is seen on the lingual aspect of the maxillary anterior teeth.

HX; psychiatric and inappropriate "body image" issues, very difficult to cure, can lead to death.
 TX: Medical and psychiatric care, prosthetic dental care.

14. Aspirin (CHEMICAL) Burn- This condition occurs when an aspirin is placed again on the mucosal tissues. The acid causes sloughing and necrosis of the epithelial tissue. In this clinical picture, the white area on the buccal mucosa resulted from an aspirin that was placed in the area.

TX: remove aspirin.

15. Attrition- This condition was caused by physiologic wear of the dentition during mastication. Although there is normal wear, there are also severe factors that can influence the extent of wear. Note the occlusal and incisal wear in this patient.

TX: prosthetics prn.

16. Black Hairy Tongue- This condition is characterized by the elongation of the filiform papillae, which affects the dorsal surface of the tongue anterior to the circumvallate papillae. This clinical picture shows the black to brown discoloration caused by chromogenic bacteria.

MICRO: often fungus overgrowth.

TX: Tongue brushing, increased oral hygiene, anti-fungal prn.

17. Calcified pulp- The pulp chamber is obliterated by calcification. This radiograph shows partial calcification of the mandibular second premolar and complete calcification of the pulp in the mandibular first molar. Partial calcification of the mandibular cuspid is observed in this radiograph.

18. Calculus-Radiograph showing interproximal calculus that appears a radiopaque "spurs."

MICRO: calcified oral bacteria.

TX: Hygiene and periodontal therapy.

19. Carcinoma-A malignant tumor of epithelium is a carcinoma. This clinical picture shows a malignant epithelial salivary gland tumor of the tongue (adenoid cystic carcinoma), basal cell carcinoma near the ala of the nose, carcinoma metastatic to the jaws, carcinoma metastatic to the jaws. Low-power microscopic view of a squamous cell carcinoma reveals islands and strands of neoplastic epithelial cells, which are seen infiltrating the fibrous connective tissue.

HX: 90% of all malignancies of the oral cavity are squamous cell carcinoma. 30,000 new cases each year with 9,000 deaths per year. Five year survival rate remains below 50%. Most all are associated in some way with smoking.

TX: early diagnosis, surgery, chemo and radiation therapy.

20. Caries-Radiograph showing radiolucent areas of interproximal decay.

21. Cementoma (Periapical Cemental Dysplasia)- This condition occurs more commonly in black women after the third decade of life. The most common site is the mandibular anterior region; the teeth associated are vital and the patient is asymptomatic. This radiograph shows multiple radiolucencies in the mandibular anterior region. Although it can resemble PAP, the teeth involved are vital in periapical cemental dysplasia.

22. Chancre- The lesion of primary syphilis of the tongue and secondary syphilis of the hands and palate.

HX: Syphilis remains a significant infectious disease.

MICRO: *Treponema pallidum*

TX: Antibiotics

23. Chemical burn- This burn of the mucosa in the anterior maxillary vestibule was caused by a chemical solution.

TX: remove agent

24. Chicken pox- This facial view shows a child with chicken pox, which is caused by the varicella virus.

HX: usually self-limiting in children, forms Herpes Zoster in adult (shingles).

MICRO: VZV (Varicella zoster virus) causes chicken pox and is related to Herpes.

TX: Anti-virals PRN.

25. Commissural lip pit and Median lip pits- This developmental anomaly is an epithelial-lined tract that may vary in depth. This clinical view shows lip pits.

26. Concrecence- This photograph illustrates concrecence, which consists of two adjacent teeth joined together by cementum.

27. Condensing osteitis- This condition is a reaction of the bone to low grade inflammation (no infection). This radiograph shows the radiopaque area at the apex of the mandibular first premolar.

TX: monitor and eval for endo.

28. Condyloma- This slide shows a condyloma in a 6-year-old child.

MICRO: HPV (human papilloma virus).

TX: anti-viral creams, chyrotherapy. Do not use lasers.

29. Coxsackievirus Infection (herpangina)-Vesicles are present on the soft palate.

MICRO: a Picornovirus (not Herpes) called Coxsackie virus

TX: Supportive

30. Cyclic neutropenia- This condition consists of a cyclic, severe reduction in neutrophils. This patient experienced gingivitis and periodontitis, which are characteristically associated with this condition.

TX; immediate medical work-up.

31. Dens Evaginus- This condition consists of an accessory cusp found on the occlusal tooth surface. This clinical view shows an extra cusp on the occlusal surface of the maxillary second premolar.

32. Dens in Dente (Dens Invaginus)- This is a developmental anomaly that results when the enamel organ invaginates into the crown of a tooth prior to mineralization. This clinical view shows a maxillary left lateral incisor with dens in dente. The maxillary lateral tooth is most frequently affected. Clinical picture of the lingual aspect of the maxillary right lateral incisor showing dens in dente.

33. Dentigerous cyst (follicular cyst)-Radiograph showing a large, well-defined radiolucency around the crown of an un-erupted second premolar. Microscopic view of a dentigerous cyst showing a cystic structure lined by epithelium and surrounded by fibrous connective tissue.

34. Dentinogenesis imperfecta- This condition is an inherited Autosomal dominant disorder in which there is abnormal development of the odontoblasts. The teeth have a characteristic brown-blue or opalescent hue. The deciduous teeth are more severely affected. The opalescent bluish hue to brownish opalescent hue in patient's teeth is characteristic of dentinogenesis imperfecta.

35. Dilacerations- This condition consists of a sharp bend or curve in a root. In this radiograph, the sharp bend is in the mesial root of the mandibular second molar.

36. Enamel pearl-A small, spherically shaped enamel projection on a root surface is called an enamel pearl. It is usually seen on maxillary molars in the furcation area. These photographs show enamel pearls. This radiograph shows an enamel pearl on the distal aspect of the second molar.

37. Erosion- This condition consists of the wearing away of tooth structure from an internal or external chemical source. In this patient, note the erosion on the mandibular posterior teeth.

38. Erythema multiforme- This condition affects the skin and oral tissues. Skin lesions have a characteristic "bull's-eye" or target appearance. This clinical view shows erythema multiforme on the hand. Oral clinical characteristics of this condition include crusting and ulceration of the lips and ulceration and erythema to varying degrees on the mucosal tissues involved. This clinical picture shows erythema multiforme affecting the lips and buccal mucosa.

39. Exostoses- These are nodular projections of dense compact bone on the buccal and labial aspects of the maxilla or mandible, or both. Note the prominent exostoses in this patient.

40. External resorption- This condition consists of the destruction of tooth structure from an outside source. It is usually seen on the roots of the teeth. These radiographs show external resorption on a mandibular incisor.

TX: if endo does not stop process, extraction.

41. Fibroma-A benign lesion with a smooth surface that is thought to be traumatically induced is called a fibroma. It is most often found near the occlusal plane. This patient has a fibroma of the gingiva. It has a sessile base and is seen in the area of the maxillary lateral and cuspid teeth. Low-power microscopic examination of an irritation fibroma reveals stratified squamous epithelium covering a core of fibrous connective tissue. Blood vessels are seen in the connective tissue.

42. Fibrous dysplasia- This is a condition in which normal bone is replaced with abnormal bone and fibrous connective tissue. This radiograph shows the alterations in normal bone density.

TX: oral maxillofacial surgery eval, medical management

43. Fissured (scrotal) tongue- This condition is considered a variant of normal and is characterized by deep grooves on the dorsal surface of the tongue.

TX: none

44. Fistula-An abnormal tract from an internal area to the outer surface is called a fistula. This patient had periapical pathosis involving the maxillary first premolar, as well as a fistula on the buccal aspect of the alveolar bone near the apices. Another shows a fistulous tract from an area of periodontal pathosis in the mandibular incisor region to the outside skin on the patient's face.

HX: Rule out diabetic modifier

TX: ENDO care and possible antibiotics, oral surgery consult.

45. Focal enamel hypoplasia (TURNER'S TOOTH). It usually affects a single tooth and is caused by trauma or infection during development.

46. Fusion-When two normally adjacent tooth germs join together, forming one large tooth, fusion occurs. This slide illustrates fusion of two molars, fusion of the mandibular central and lateral incisors, and radiograph showing fusion of the crowns and roots.

47. Gemination- This condition is also referred to as "twinning." It occurs when a single tooth germ splits completely or partially, forming separate crowns. The tooth usually has a single root and root canal. This patient exhibits gemination in both maxillary central incisors.

48. Geographic tongue (migratory glossitis)-In this patient, the dorsal and lateral borders of the tongue are affected. Red patches are seen as a result of a lack of filiform papillae, and these patches are surrounded by a yellow or white border. When the filiform papillae regenerate, the area returns to normal. However, another area will begin to break down, and the filiform papillae will be destroyed.

HX: some authors feel a variant of psoriasis.

TX: palliative.

49. Gingival cyst-A soft tissue lesion histologically resembling a lateral periodontal cyst is seen on the attached gingiva near the cuspid.

50. Gingival fibromatosis- This slide shows an isolated gingival fibromatosis, which is inherited in an autosomal-dominant manner. A superimposed inflammatory reaction is also observed.

HX: genetic, medications or plague induced.

TX; remove agent if possible, surgery.

- 51. Gingival hyperplasia**-Proliferation of the gingival tissues resulting from irritants associated with periodontal disease is called gingival hyperplasia.
TX: remove medications and or surgery.
- 52. Gingivitis**-Irritation of the tissues in this young patient was caused by plaque and calculus.
- 53. Globulomaxillary cyst**- This pear-shaped radiolucency is seen between the maxillary cuspid and lateral incisor teeth.
- 54. Hairy leukoplakia**- This is a condition that characteristically involves the lateral borders of the tongue. It is seen almost exclusively in human immunodeficiency disease (HIV)-seropositive patients.
MICRO: Epstein-Barr virus was found in the lesion.
TX: Antiviral therapy.
- 55. Hemangioma**- This deep purple lesion on the buccal mucosa is a benign lesion involving blood vessels. It is usually congenital. Low-power microscopic evaluation of this benign vascular lesion of stratified squamous epithelium covering fibrous connective tissue revealed a congeries of large and small endothelial lined, blood-filled vessels.
- 56. Hematoma**-A hematoma consists of a benign vascular lesion caused by trauma.
- 57. Hemophilia**- This is a genetic bleeding disorder that frequently has oral manifestations. Spontaneous gingival bleeding may occur.
- 58. Herpes simplex**- This patient has primary herpetic gingivostomatitis. Note the ulceration on the lower lip, which is characteristic of the condition.
- 59. Herpetic whitlow**-When herpes simplex involves the fingers, it is referred to as herpetic whitlow.
- 60. Human immunodeficiency virus (HIV)**- This patient's tongue exhibits herpetic lesions. In immunodeficient patients, these ulcers may occur in any oral mucosal location.
- 61. Hutchinson's incisors**- This slide shows the characteristic screwdriver-shaped incisors with a notched incisal edge (maxillary centrals!), resulting from congenital syphilis.
- 62. Hypercementosis**-Radiograph showing excessive cementum on the roots, causing them to appear bulbous.
- 63. Hyperkeratosis**-low-power microscopic examination reveals orthokeratotic stratified squamous epithelium covering fibrous connective tissue. A granular layer is present in the epithelium when it is covered by orthokeratin .
- 64. Hypodontia**-Clinical example of hypodontia showing missing teeth.
- 65. Hypohidrotic ectodermal dysplasia**- This patient had only these three abnormally shaped teeth. Note the dryness of the skin.
HX: Origins of the vampire(?).
- 66. Hypoplasia (enamel hypoplasia)**- This condition consists of inadequate development of the enamel. Discolored pitting is observed in the incisal third of the affected teeth in this patient.
- 67. Impacted teeth**- Several examples of teeth.

68. Internal resorption-It is thought that internal resorption is traumatically induced and develops from an inflammatory response of the pulp. The resorption occurs from inside the pulp and works its way to the outer surface of the tooth. A diffuse radiolucency is seen in the crown and root of this patient's maxillary first molar. This was the first sign of the condition and, unfortunately, the patient lost the tooth.

TX endo or extraction.

69. Iron deficiency anemia-Oral manifestations of iron deficiency anemia include angular cheilitis and a smooth, red tongue with atrophy of the papillae.

TX: medical, B vitamin shots, iron

70. Irritation-Inflammation of the palate resulting from a flipper (a removable prosthesis with very few teeth!).

71. Kaposi's sarcoma of the skin- This is a vascular malignancy that frequently occurs in patients with acquired immunodeficiency disease (AIDS). This patient had a lesion on the skin near the ear.

MICRO: Herpes 8 virus found in these lesions.

72. Leukemia- This is a malignancy characterized by excessive production of immature white blood cells. Gingival enlargement is due to an infiltration of these cells.

73. Leukoedema- This is a condition characterized by a generalized opalescent hue of the buccal mucosa that is considered a variant of normal. The whiteness disappears when the tissue is stretched.

74. Leukoplakia- This white lesion was histologically characterized by dyskeratosis and epithelial dysplasia. Microscopic examination is essential for the diagnosis. Smoking, tobacco chewing, and many other factors need to be accounted for in these conditions.

75. Lichen planus- This condition commonly affects the mucous membranes (as well as other tissues!) of the oral cavity, and oral lesions can appear prior to the skin eruptions. There are several forms or types of lichen planus. This patient's buccal mucosa showed a white plaque-like pattern. The characteristic white, lace-like pattern is seen on the buccal mucosa of this patient with lichen planus is known as Wickham's striae. This patient exhibited erosive lichen affecting the buccal mucosa and lateral border of the tongue. Low-power microscopic examination reveals orthokeratotic stratified squamous epithelium covering fibrous connective tissue. The epithelium exhibits elongated rete ridges, and the inflammatory cells in the connective tissue are located near the epithelium.

HX: always rule out Hepatitis and liver disease first.

TX: topical steroids

76. Linea alba- This elevated white line on the buccal mucosa extends from the anterior to a posterior position along the occlusal plane.

77. Mandibular tori- This is a benign hereditary condition involving exostosis of bone on the lingual aspect of the mandibular premolar area. Mandibular tori may be single, multiple, or lobulated and are usually bilateral. This clinical view shows bilateral lobulated tori.

78. Median rhomboid glossitis- This is a condition in which an area in the midline of the tongue, just anterior to the circumvallate papillae, is devoid of filiform papillae. The area is smooth and erythematous. *Candida albicans* has been associated with this lesion.

79. Melanin pigmentation- This can be a normal hereditary and developmental dark pigmentation in the skin or soft tissues. This clinical picture shows melanin pigmentation on the various portions of the oral cavity.

HX: rule out melanoma

TX: biopsy.

80. Mesiodens-Clinical view of a mesiodens, which is a supernumerary tooth that is usually seen between the maxillary central incisors.

81. Microdont- This is a small tooth. In this clinical view it can be seen distal to the maxillary molar. Radiograph of microdont distal to the maxillary molar.

82. Mononucleosis- This disease is caused by the Epstein-Barr virus. Oral mucosal petechiae are sometimes seen in patients with mononucleosis.

MICRO: EBV

TX: supportive

83. Mottled enamel- The discoloration of the enamel seen in this slide resulted from fluoride ingestion.

84. Mucocele- This fluid-filled lesion is most commonly seen on the mucosa inside the lower lip. It is filled with salivary gland fluid and ruptures easily. This patient has a mucocele inside the lower lip a few millimeters from the commissure. Low-power microscopic examination reveals a cyst-like structure close to the surface of the epithelium. Some mucin is seen in the lumen. Granulation tissue containing mucin is seen in the subjacent area of the connective tissue. A salivary gland lobule is also present.

85. Mulberry molars- This is a congenital defect caused by syphilis. The occlusal surface of the molar has many small globules of enamel, not cusps. This developmental anomaly is due to congenital syphilis.

86. Multiple neurofibromas- This condition is characteristic in this patient with von Recklinghausen's disease.

87. Nutrient canals-Normal radiographic landmarks that are radiolucent and extend from the apices are prominently seen in this radiograph.

88. Odontogenic keratocyst- This multilocular, radiolucent odontogenic keratocyst has unique histologic characteristics that confirm the diagnosis.

89. Odontoma (complex)- This is a benign structure comprised of tooth structures that have been laid down in a manner in which tooth anatomy cannot be identified. This radiograph shows a complex odontoma observed here as a radiopaque area at the apex of the maxillary central incisor, reveals irregular masses of tubular dentin and enamel matrix.

90. Odontoma (compound)- This condition is a mixture of ameloblasts and odontoblasts laid down in an organized fashion in which there is more of a resemblance to a tooth. This radiograph shows a radiopaque structure between the roots of the maxillary premolars, which was diagnosed as a compound odontoma. Grossly, the odontoma contains small tooth-like structures. A medium-power microscopic examination reveals discrete structures composed primarily of tubular dentin, one of which contains a central area of pulp tissue. The enamel rods dissolve when the specimen is decalcified so that it can be sectioned. However, the basophilic fibrillar material that is the protein matrix of the enamel rods remains after decalcification.

91. Osteogenesis imperfecta- This syndrome is inherited in both an autosomal- dominant and an autosomal-recessive manner. Teeth in a patient with osteogenesis imperfecta can be yellowish with chipped enamel.

92. Osteoma- This is a benign neoplasm that is characterized by proliferation of compact or cancellous bone. Note the radiopacity in this radiograph mesial to the mandibular second molar.

93. Osteomyelitis-Low-power microscopic examination reveals nonviable bone. There is irregular resorption of the surface of the bone. Inflammatory cells, primarily neutrophils, are seen in the connective tissue at the periphery of the bone. Bacterial colonies are also present.

94. Paget's disease of bone-Clinical view showing expansion of the maxilla. The radiographic appearance of this condition depends on the stage of the disease. The patchiness often observed has been described as a "cotton wool" appearance and is especially characteristic in the jaws. This radiograph illustrates the "cotton wool" appearance in the mandible. It is important to note that the serum alkaline phosphatase level is significantly elevated in Paget's disease. Thus a laboratory test is extremely relevant to the diagnosis.

95. Papilloma- This is a benign, slow-growing growth of papillary projections with a "cauliflower-like" surface that is usually white. It can be found anywhere intra-orally. This patient has a papilloma on the posterior portion of the palate.

MICRO: PAPOVAVIRUS family PAPILLOMA VIRUS (not herpes)

TX: laser, chryotherapy, chemical.

96. Papillary hyperplasia- This condition is also referred to as pseudopapillomatosis. It results from irritation to the palate from an ill-fitting denture. This clinical view shows glistening red papillary projections.

MICRO: Usually *Candida*

TX: new denture (?), anti-fungals.

97. Peg lateral- The maxillary lateral incisor that develops as a microdont is called a peg lateral. This is a clinical view of a peg lateral.

98. Pemphigoid (benign mucous membrane pemphigoid)- This condition is an autoimmune disease characterized by subepithelial bullae formation that affects mucous membranes, including the oral cavity. It is also referred to as cicatricial pemphigoid, since scarring can result during the healing process. The appearance of the gingiva here is called desquamative gingivitis.

TX: Biopsy and steroids.

99. Pemphigus vulgaris- This is another autoimmune disease; however, in this condition, the lesions are intraepithelial. Note the ulceration on the mucosa and the inflamed gingiva.

HX; very serious, potentially fatal skin disease.

TX: Biospy and Oral Medicine or Dermatology.

100. Periapical PATHOSIS: Observe the radiolucency at the apex in this radiograph. Microscopic examination is necessary to determine the final diagnosis of the lesion.

TX: Endo.

101. Pleomorphic adenoma- This is a benign salivary gland tumor, which in this patient is located on the posterior portion of the palate.

TX: Oral Surgery.

102. Peutz-Jeghers syndrome-Oral pigmentations associated with intestinal polyposis.

TX: medical work-up for polyps.

103. Pregnancy tumor-A tumor that is histologically the same as a pyogenic granuloma and is a reactive inflammatory lesion. This patient exhibits a pregnancy tumor on the tongue.
TX: Treat, as needed, ideal therapy after lactation has ceased.

104. Primordial cyst- This is a cystic lesion that develops in place of the tooth.
Note the radiolucency in the mandibular third molar area.
TX: Oral Surgery.

105. Pulp polyp- This is also referred to as chronic hyperplastic pulpitis. It is a reactive lesion usually seen in a carious molar. Note the pink mass of inflammatory tissue on the occlusal surface of the mandibular second molar.
TX: ENDO

106. Pyogenic granuloma- This is an inflammatory response to an irritant. Note the pyogenic granuloma on the labial papillae between the maxillary central and lateral incisors in this 11-year-old child undergoing orthodontic therapy. Low-power microscopic examination reveals ulcerated, stratified squamous epithelium covering a core of well-vascularized, edematous, and inflamed fibrous connective tissue.

107. Radicular cyst- This cyst is usually a result of dental caries. Note the well-circumscribed radiolucency around the apex of the mandibular premolar.

108. Radiographic artifact- The radiopaque objects, shotgun pellet, seven-carat cubic zirconia (round stone) that was glued to the tooth on the labial aspect.

109. Ranula- This is a soft tissue cyst-like lesion found in the floor of the mouth caused by trauma or blockage of one of the major salivary ducts. This is a lesion with a characteristic blue-purple hue seen in the floor of the mouth.

110. Recurrent Aphthous Ulcers (RUA)- These ulcerations are characteristic of recurrent aphthous stomatitis.

111. Resorption of the roots- This radiograph illustrates short, blunted roots, which occurred following orthodontic tooth movement.

112. Retained deciduous tooth- This radiograph of an adult dentition shows a retained deciduous tooth. The deciduous tooth also has an amalgam restoration.

113. Skin graft- This is an anterior clinical view of a patient with her dentures in place.

114. Stafne's bone cyst (static bone cyst, lingual mandibular bone concavity -This well-circumscribed radiolucencies near the angle of the ramus filled with salivary gland tissue is a Stafne's bone cyst.

115. Supernumerary roots-Radiograph showing extra teeth.

116. Taurodont-Radiograph showing a molar that appears elongated and has large pulp chambers and short roots. Bull-like teeth is a term used to describe this developmental anomaly.

117. Thyroglossal duct cyst-Clinical picture of the patient's face and neck profile showing swelling from the cyst.

118. Torus palatinus-Clinical picture of a large lobulated torus palatinus.

119. Traumatic ulcer- This is an ulcer on the posterior mandibular alveolar ridge caused by irritation from a denture.

- 120. Trisomy 13-** This slide of a newborn demonstrates the characteristic cleft lip, frontal hemangioma, and abnormal position of the fingers in trisomy 13.
- 121. Turner's syndrome-** This clinical picture shows webbing of the neck.
- 122. Ulcerative colitis-**Clinical picture of oral ulcerations on the soft palate associated with ulcerative colitis.
TX: Medical work-up
- 123. Varices-** These are prominent lingual veins.
- 124. Vitamin deficiency-** This smooth, dark red tongue resulted from a deficiency of the B-complex vitamins.
- 125. White hairy tongue-** This is a condition that is characterized by the elongation of the filiform papillae affecting the dorsal surface of the tongue just anterior to the circumvallate papillae. These projections are white.
MICRO: Candidiasis and normal flora.
- 126. White Spongy Nevus-** variation of normal
- 127. Diabetes modified disease: number two modifier of oral disease.**
- 128. Keratoacanthoma**
- 129. Medication Induced Lesions: metronidazole, gold salts etc.**
- 130. Oral Sex: trauma secondary to oral sex.**
- 131. Necrotizing sialometaplasia-** This is a benign inflammatory reaction of salivary gland tissue resulting from local ischemia. This patient exhibits the condition in the most frequent site of occurrence (the palate) and initial ulceration.
- 132. SMOKING:** Number one modifier of oral disease.
- 133. Wheel (Angio-neurotic edema of the face).**