Unit #4- Oral Disease with Immunologic Pathogenesis

Aphthous Ulcers: Canker Sores, (R.A.S) Recurrent Aphthous Stomatitis
- Most common seen ulceration affecting unkeratinized tissue such as the buccal mucosa, labial mucosa, floor of mouth, ventral of tongue, soft palate and posterior oropharynx
- Ulcers have a distinct size, shape and location
- Painful
- Elapsed time between recurrence is extremely variable. Some unfortunate clients have continuous disease whereas others may go for months or years between episodes

Demographics of Aphthous Ulcers
- 20% prevalence of general population
- More incidence in professional school population approx. 57%
- Affects all age groups from young to old but young adults mostly affected
- First episode usually occurs in adolescence
- Somewhat more common in females
- Diagnosis based on clinical signs and location and patient history
- Reported to occur more frequently in non-tobacco users-smoke causes more keratinized tissues, lowering susceptibility
- 3 stages: prodomal, ulcerative, healing

Suggested Causes
- Trauma is most common precipitating factor—often reported following dental procedure (film placement or cotton roll placement site, injection site, dental hygiene treatment); consuming hot liquids
- Emotional stress, food allergies
- Hypersensitivity reaction
- Hormonal fluctuations: Menstruation, pregnancy decreases occurrence
- Vitamin B12 deficiency

Evidence: Immunologic Pathogenesis
- Slightly elevated level of antibodies to oral mucous membranes. Histologically there is an infiltrate of lymphocytes in the lesion suggesting that cell-mediated immunity is important in development of ulcers
### Differential Diagnosis Associated with Aphthous Ulcers
- Hand, Foot, Mouth disease
- Herpangina
- Behcet’s syndrome
- Crohn’s disease
- Ulcerative colitis
- Cyclic neutropenia
- Sprue- (gluten intolerance)
- Intestinal lymphoma
- AIDS/HIV infection

### Three forms of Recurrent Aphthous Ulcers
- Minor
- Major
- Herpetiform

### Minor Aphthous Ulcer
- Most common of the 3 types - making up 70-80% of all forms of RAS
- Discrete, round to oval ulcers
- Up to 1 cm in diameter
- Less than 5 ulcers present at any one time

### Location of Minor Aphthous Ulcers
- On movable oral mucosa (mucosa not covering bone)
- Labial and buccal and vestibular mucosa
- Ventral and lateral borders of the tongue
- Soft palate and oropharynx
- Sometimes extends to gingiva
- More common in anterior of mouth than posterior

### Development and Healing
- Prodromal period (1-2 days)
- Burning sensation or soreness in area
- Craterlike ulcer will develop a fibrinous membrane cover appearing white or yellow, surrounded by a halo of erythema
- Ulcers heal spontaneously in 7-10 days
- Treatment: none. In severe cases - application of topical steroids during prodromal period
- Topical analgesics or anti-inflammatory agents such as Orabase with Benzocaine

### Minor Aphthous Ulcer
Major Aphthous Ulcers

- “Sutton’s disease” or “periadenitis mucosa necrotica recurrens”.
- Is the largest of the 3 types; less common in occurrence (7-20% of RAS).
- Ulcers are crater form, asymmetrical.
- Larger than 1 cm; deeper; last longer (several weeks): Pain is severe with a depressed necrotic center.
- More common in posterior of the mouth: soft palate, tonsillar fauces, labial and buccal mucosa, and the tongue.
- Frequently results in scarring.
- Patient may suffer with the chronic disease for years.

If Persistent:

- Requires biopsy to rule out other causes of ulceration (e.g., Squamous cell carcinoma).
- Deep and persistent lesions may become secondarily infected with bacterial and fungal organisms—antimicrobial rinses.

Major Aphthous Ulcer

Immunological Link

- Ulcers resembling major aphthous ulcers seen in association with HIV infection.

TREATMENT

- Treatment: Short term systemic and topical steroids to accelerate healing and reduce scarring.
- Topical anesthetics to allow nutritional intake.

Herpetiform Aphthous

- Least common of R.A.S.
- Very tiny (1-2mm), widely distributed, gray-white erosions that enlarge, coalesce and become irregular ulcers.
- Frequently mistaken for primary herpes simplex infections.
- Painful.
- May develop anywhere in the mouth (more commonly in unattached gingiva).
- Occur in groups of 10 and more, tend to appear in cluster formation; coalescing to produce the appearance of a larger lesion.
Diagnosis Made on the Basis of:
- Clinical appearance
- Recurrent nature and the absence of vesicles and gingivitis is distinguishing factor
- No systemic symptoms (unlike herpes virus)
- Therapeutic diagnosis—respond to topical application of liquid tetracycline (unlike Herpes Simplex Virus)

Clinical Features of Urticaria and Angioedema (allergic reactions)
- **URTICARIA**—hives
  - Localized multiple areas of well-demarcated swelling of the skin accompanied by pruritis (itching)
  - Swelling caused by permeability of blood vessels in superficial connective tissue
- **ANGIOEDEMA**—Appears as diffuse swelling of tissue from permeability of deeper blood vessels
  - Skin covering the swelling appears normal with no itching
  - Both can be one acute episode or can recur

- cont:
  - May be due to the release of histamine from mast cells stimulated by activation of IgG or IgM antibodies
  - Also aspirin and ibuprofen can cause a non-specific effect of vascular permeability
  - Treatment: Antihistamines are of limited benefit in Hereditary Angioedema
  - Long term drugs such as androgens can reduce the frequency and severity of attacks
  - Severe cases: adrenaline injection

Treatment
- Use of systemic steroids and oral rinses of liquid tetracycline
- Low-dose steroid treatment for prolonged attacks to prevent rapid recurrence

Etiology (Urticaria and Angioedema)
- In many cases the cause is unknown
- Associated with trauma, stress, allergies, infection, systemic diseases
- Rare hereditary form of Angioedema (Hereditary Angioedema) swelling develops after mild trauma (ie. Extraction) causing gastrointestinal and respiratory reactions which could result in medical emergency
- May develop rapid swelling of hands, feet, limbs face, intestinal tract (pain, diarrhea) or airway (deadly)
- Unlike allergic reaction there is no itching or hives

Diagnosis and Treatment
- Based on clinical appearance and patient history
- Avoidance of causative agent to prevent future episodes
- Antihistamine drugs
- Angioedema involving larynx/pharynx can cause asphyxiation creating medical emergency
Angioedema/Urticaria

- Angioedema from latex
- Urticaria

Erythema Multiforme

- Affects skin and mucous membranes
- Called erythema multiforme because it refers to the “multiple forms” that it appears in. Skin lesions ranging from macules to plaques to bullae therefore it has been divided into two subgroups: EM minor or Steven Johnston Syndrome
- Cause is unclear
- (hypersensitivity???) Possibly associated with exposure to herpes simplex virus, tuberculosis, fungal infections;
  medications: sulphas, penicillin, barbiturates, phenytoin.
- Commonly occurs in young adults
- Men more than women

Clinical Appearance of Erythema Multiforme (minor) on Skin

- Skin lesion called Target, Iris, or Bull’s Eye lesion
- Concentric rings of erythema alternating with normal skin color
- Most intense on backs of hands or feet
- Can occur on skin alone or along with oral lesions
- Explosive onset, mild or no systemic symptoms

Clinical Appearance Intraorally

- Diagnosis based on clinical appearance and exclusion of other diseases
- Oral lesions are usually ulcers
- Frequently on lateral borders of tongue
- Crusted and bleeding lips frequently seen
- Gingival involvement - rare

Skin Lesions of Erythema Multiforme

- Client previously had herpes simplex infection

Erythema Multiforme
Stevens-Johnson Syndrome

- Most severe form of Erythema Multiforme
- Mortality rate 5-15%
- Severe mucosal lesions
- Genital mucosa and mucosa of eyes involved (conjunctiva)
- Lips have black hemorrhagic crust
- Mucosal lesions are raw and red in appearance
- Severe pain
- Medications are thought to be main causative factor: antibiotics, NSAID’s, anti-seizure medications

Treatment

- Palliative, but short term
- Usually systemic corticosteroids; topical corticosteroids in mild cases
- Stevens-Johnson eye lesions may lead to scarring/blindness
- Systemic antiviral meds for episodes stimulated by herpes simplex infection
- Lesions usually subside within a few weeks, but recurrent lesions are possible in 25% of cases

Clinical Appearance of Fixed Drug Eruption

- Type of allergic reaction to a drug
- Lesions appear in same site each time a drug is introduced; with each exposure however, the number of involved sites may increase
- Lesions appear within days of taking the drug
- Lesions subside when drug is discontinued
- Lesions begin as a itching erythematous patch, then becomes edematous and sometimes bullous

Single or multiple slightly raised round or oval reddish patches on the skin, sometimes involving a blister
- As healing occurs crusting and scaling is followed by a persistent purplish or brown color
- Type of allergic reaction; drug identified and discontinued (sulphas, barbiturates, oral contraceptives, tetracycline)

Contact Mucositis

- Local reaction from direct contact of an allergen with mucosa
- Involves cell-mediated immunity; hypersensitivity of lymphocytes to additives
- Flavouring agents in dentifrices may be a possible cause, chewing gum,
- Dental materials such as acrylics and metal-based alloys
Clinical Features of Contact Mucositis

- Erythematous and edematous mucosa often accompanied by itching/burning
- Tissue is smooth, shiny, firm to palpation
- May have small vesicles/ulcers in affected area
- Sloughing of tissue (hypersensitivity to toothpaste)

Dermatitis

- Lesions may be erythematous with swelling and vesicles
- Area then becomes encrusted with scaly, white epidermis
- May be in response to material such as latex or powder in gloves
- Skin testing for sensitivity
- Topical/systemic corticosteroids

Lichen Planus

- **ORALLY** the most frequently affected site is the buccal mucosa; Lips, tongue, gingiva and floor of mouth may also be affected
- Lesions are frequently distributed symmetrically in oral cavity
- **SKIN LESIONS** are 2-4 mm papules. Wickham Striae and itching may also be present. Most common area is lumbar region, wrist, and ankles.
- Diagnosis based on clinical appearance and histologic appearance of biopsy

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Lichen Planus

- Benign, chronic inflammatory disease affecting skin and oral mucosa (one or both may be affected)
- “Lichen” refers to lichen plant which grows on rocks and trees; “planus” means flat
- More common in middle aged females
- Cause unknown however stress, anxiety, hypersensitivity to certain drugs and chemicals have been known to cause lesions
- Predominately in women with average age of 57
- Controversy exists about malignancy potential. May begin as lichen planus – becoming dysplastic or cancerous

Types of Lichen Planus

Reticular (Wickham Striae): Most common. Several white lines and tiny papules arranged in lacy, web-like pattern; asymptomatic. They may involve a large area. Buccal mucosa is most common; tongue, floor of mouth, lips, palate and gingiva may also be affected. Lesions are frequently distributed symmetrically.

Erosive: The epithelial surface is completely lost and results in erosion. (Bullae or vesicle breaks causing erosion). Mature lesions has irregular borders; is red, raw and ulcerative – yellow necrotic center with a white patch at periphery (painful). Buccal mucosa and tongue are most commonly affected areas. Erosive form associated with increased malignancy potential. Chronic form should be monitored with biopsy when changes occur.
3. Atrophic: appears as red patches with very fine white straie. This form also appears on the gingiva with varying patterns of redness and straie.

4. Plaque-form is least common type. Asymptomatic solid white patch or plaque, smooth-slightly raised surface. Common on buccal mucosa or tongue. May resemble leukoplakia.

TREATMENT
- Chronic disease
- Treatment indicated when lesions are symptomatic
- Erosive lesions respond to topical corticosteroids
- Meticulous oral hygiene shows improvement
- Drug identification and discontinuation if deemed as causative agent
- Regular examinations for increased risk of squamous cell carcinoma (erosive LP)
- Biopsy for lesions not responding to treatment or those that show growth or mass changes
- Diff. Diagnosis may include Candidiasis, Leukoplakia

REITER SYNDROME
- Syndrome is a group of signs and symptoms which occur together.
- Reiter’s is also referred to as reactive arthritis - triad of arthritis, conjunctivitis, urethritis, psoriasis
- “Can’t see, Can’t pee, Can’t climb a tree”
- Effects people with certain body tissue (HLA-B27) derived genetically from parents in same way hair color and blood type is established
- Syndrome is related to an abnormal immune response

- Affect men more than women - 6-10% are Caucasian, less common in African decent
- Caused by some types of bacteria which travel through body affecting joints and bones. Also affects skin, eyes and muscles
- Benign syndrome includes:
  A) Arthritis involves lower extremities - knees, ankles, wrists - redness and swelling
  B) Fever, malaise, weight loss may be associated with arthritis
  C) Urethritis - pain upon urination, genital sores may become infected; pain in pelvic area
  D) Conjunctivitis: red sore eyes, blurred vision, eyelids may stick together in morning
  E) Psoriasis - sores on palms of hands and soles of feet
  F) 10% develop cardiac manifestations: aortic regurgitation and pericarditis
**Oral manifestations**
- Lesions occur anywhere in oral cavity
- Aphthous-like ulcers, erythematous lesions, geographic tongue-like lesions
- DIAGNOSIS: develop warning signs after exposure to a venereal disease or a gastrointestinal infection (food poisoning)
- Based on clinical signs and symptoms along with (HLA-B27) antigenic marker

**Treatment**
- Disease lasts from weeks to months and approx. of clients affected for years
- More than 40% of clients will have chronic disabling arthritis, heart disease and impaired vision
- May require prophylactic antibiotic (heart)
- Patient may experience remission with recurrent episodes
- 15-20% develop progressive arthritis
- Aspirin or other nonsteroidal anti-inflammatory drugs
- Cortisone injections for long term joint pain

**Autoimmune Diseases that Affect the Oral Cavity**

**Etiology of Sjogren’s Syndrome**
- Autoimmune disorder
- Cause is unknown
- Is the second most common connective tissue disorder after Lupus Erythematous
- Predominately in women 30-65 yrs
- Chronic condition requiring long term management and lifestyle adaptations

**Sjogren’s Syndrome**
- Chronic condition requiring long term management and lifestyle adaptations
- Symptoms:
  - Affects the salivary and lacrimal glands
  - This combination is called :Sicca syndrome
  - Xerostomia and xerophthalmia (dry mouth and eyes)

**Other Diseases Associated with Sjogren’s Syndrome**
- Two forms of the disease:
  - **Primary** Sjogren’s syndrome-lacrimal and salivary gland involvement alone
  - **Secondary** Sjogren’s syndrome-combined with another autoimmune disease
- 50% of clients with Sjogren’s also have another autoimmune disease (rheumatoid arthritis or systemic lupus)
Oral Manifestations of Sjogren’s Syndrome

- Xerostomia from deceased salivary flow
- Mouth feels sticky, difficulty swallowing, altered taste,
- Lips are cracked and dry
- Generalized loss of filiform and fungiform papillae on dorsal of tongue, fissuring
- Difficulty wearing prosthetic appliances-dentures
- High risk for development of caries, periodontal disease and oral Candidiasis
- What salivary gland disorder may be affected by Xerostomia in Sjogren’s?
- Parotid gland enlargement (bilateral and symmetric in 50% of clients)

Eye Signs and Symptoms

- Burning and itching eyes, blurred vision
- Photophobia (intolerance to light) and a feeling that there is something in their eyes
- May have ulceration and opacification of the cornea

Diagnosis and Management of Sjogren’s Syndrome

- Diagnosis made when two of its three components are present:
  - Xerostomia
  - Keratoconjunctivitis sicca (confirmed by eye examination)
  - Rheumatoid arthritis or another autoimmune disease

Other Complications

- Raynaud’s phenomenon-affects fingers and toes
- Cold temperatures and emotional stress trigger the reaction
- Initial pallor of skin, after rewarming skin becomes red, skin eventually returns to normal colour

Treatment

- Management of symptoms of disease
- Nonsteroidal inflammatory drugs for arthritis
- In severe cases: corticosteroids and immunosuppressive drugs
- Saliva substitutes, humidifier for sleeping, sugarless gum, candy, to stimulate salivary flow (Xylitol). Bacteria ingest Xylitol over sucrose, but they are unable to metabolize it so the number of bacteria and acid level in the mouth drop
- Artificial tears for dry eyes
- Meticulous oral hygiene including fl. Rinses, pastes, frequent recare visits (perio., caries prevention)
- If severe arthritis oral hygiene aids modified for home care
- 6-10% associated with malignant transformation of altered glandular tissue to lymphoma
Systemic Lupus Erythematosus

- Acute and chronic inflammatory autoimmune disease of body's connective tissue. Affects tissues throughout body but the cause is a mystery.
- Classified into 2 groups: discoid Lupus Erythematosus (chronic form 70% of cases), Systemic Lupus Erythematosus (acute form 10% of cases)
- Most common is chronic with periods of remission
- Affects women 8x more than men
- Predominately during childbearing years
- Occurs 3x more frequently in black women than white women
- Ranges from lesions confined to the skin (discoid LE) to widespread life-threatening systemic disease (SLE)

Oral Lesions

- Present in approx 25% of patients
- Lesions are erythematous plaques, erosions, ulcerations surrounded by a rim of white keratotic Striae
- Lesions resemble lichen planus, pemphigus
- Gingival Lesions can desquamative and very painful
- Most common sites are the hard/soft palate, buccal mucosa, vermillion border of the lips
- Petechia and gingival bleeding may be present in clients with severe thrombocytopenia
- Patient may complain of dryness
- If corticosteroids are used, Candidiasis may be present
- Biopsy required for definitive diagnosis

Clinical Features:

- Most common sign: Skin lesions in 85% - DLE
- Red rash involving areas exposed to sunlight (intensifies with increased sunlight)
- Classic “butterfly” rash occurs over bridge of nose and cheeks (approx. 25-40% of clients)
- May have red lesions on fingertips
- Lesions heal with scarring in center and continue to spread at periphery
- Atrophy, hyperpigmentation can follow lesions (usually in pigmented skin)

Systemic Lupus Erythematosus

- Erythematous Systemic Lupus
- Rash of Lupus
- Typical Facial “Butterfly” Rash of Lupus

Treatment of Lupus Erythematosus

- Treatment of symptoms will vary depending on severity of disease:
  - Oral and skin lesions respond to topical and systemic corticosteroids
  - Anti-inflammatory agents
  - Antibiotic prophylaxis for clients with heart valve involvement
  - Antimalaria drugs
  - Renal failure is the most common cause of death
  - 20 yr survival rate is approx 70%
- SLE may include other autoimmune diseases such as Sjogren’s and rheumatoid arthritis, weight loss, muscle pain, Raynaud phenomenon, retinal vasculitis causing loss of vision, depression, shortness of breath, celiac disease, facial parotid swelling, pericarditis, cardiac arrhythmias, kidney involvement, thrombocytopenia and potential malignant changes.
- Complex disease treated with many drugs.
- No cure. Lifelong disease requiring attention and management
Pemphigus Vulgaris
- Progressive autoimmune disease affecting skin and mucous membranes
- Characterized by intraepithelial blister formation from a breakdown of cellular adhesion between cells. This epithelial cell separation is called acantholysis

Oral Lesions of Pemphigus Vulgaris
- In more than 50% first signs of disease occur in the oral cavity
- Lesions range from shallow lesions to fragile vesicles or bullae
- Bullae rupture and gray membrane remains
- Ulcers are painful and range in size
- Gentle finger pressure produces cleavage on epithelium resulting in Bulla (Nikolsky Sign)

Demographics of Pemphigus Vulgaris
- No sex predilection
- Broad age range affected
- Most occurs in 4th and 5th decade of life
- Individuals of Jewish or Mediterranean descent more commonly affected

Skin lesions include erythema, vesicles, bullae, erosions and ulcers

Treatment and Prognosis
- High doses of corticosteroids and autoimmunosuppressive drugs
- Life threatening condition: Mortality rate - 8%-10%
- Other autoimmune diseases associated with pemphigus vulgaris - SLE (lupus), rheumatoid arthritis, Sjogren’s syndrome

Diagnosis
- Biopsy, microscopic examination
Cicatricial Pemphigoid
- Cicatricial: healing with scarring
- Also called mucous membrane pemphigoid and benign mucous membrane pemphigoid
- Chronic autoimmune disease affecting people 50-60 years of age (predominantly females)
- Affects oral mucosa, eyes, genital mucosa and skin
- Not as severe as pemphigus vulgaris; bullae are short-lived, break quickly and desquamate leaving raw erythematous surface (Nikolsky sign)
- Lesions may scar on skin, but rarely in the oral cavity

Oral manifestations
- Occurs on gingiva (free and attached)
- Gingiva is a target site for this disease exhibiting erythematous, shiny red tissue
- Lesions range from erythema to ulceration similar to pemphigus, lichen planus; Nikolsky sign can be produced
- Gingiva is very friable and even gentle oral hygiene can cause the tissue to slough

Treatment
- Avoid substances that my cause discomfort or worsen the mucosal condition
- Discontinue oral products that burn such as alcohol based mouth washes, spicy foods, cinnamon, soft drinks and strong flavoring agents
- Dietary analysis for clients
- Susceptible to caries and perio disease
- Frequent maintenance visits performed with caution

Diagnosis and treatment
- Biopsy and histologic examination
- Topical corticosteroid application in mild cases
- Systemic corticosteroids if severe—monitor for Candidiasis

Bullous Pemphigoid
- Similar to Cicatricial pemphigoid however skin lesions usually occur first
- Oral lesions less common in Bullous Pemphigoid
- Occurs in patients older than 60 years
- Cutaneous bullae develop slowly and last for weeks to months before breaking
- Chronic course with remission
**Treatment**
- High doses of systemic corticosteroids and nonsteroidal anti-inflammatory drugs
- Disease is chronic with periods of remission

**Behcet’s Syndrome**
- Chronic, recurrent autoimmune disease
- Consists primarily of oral ulcers (RAS), genital ulcers, and ocular inflammation
- No sex predilection
- Average age of onset is 30 years
- More severe in Eastern Mediterranean and Asian decent

**Oral lesions of Behcet’s**
- Similar to aphthous ulcers
- Painful and recurrent
- Range in size

**Diagnosis and treatment**
- Is a rare multisystem disorder noted for a triad of (1) RAS oral, (2) genital ulcers, (3) ocular lesions
- Requires the presence of at least 2 or principal manifestations (oral, genital, ocular)
- Other problems may exist such as gastrointestinal, vascular, muscular, and hematologic abnormalities
- A pustular lesion that develops after local injection is highly indicative of Behcet’s Syndrome
- Systemic/topical corticosteroids
- Occasionally immunosuppressive drugs: cyclosporine
- Dental implication: gingival hyperplasia from use of cyclosporine: monitor tissues at each visit

**Infectious Diseases**

**Bacterial**

**ACTINOMYCOSIS:**
- Is a chronic bacterial disease that manifests in the formation of an abscess, sometimes draining externally. Lesion may be observed extraorally as a draining lesion in the lower facial region.
- Caused by Actinomyces israelii, an anaerobic gram-positive bacterium which are forced into the tissue and proliferate following tissue trauma from surgery, tooth extraction or an abrasion of the mucosa.
- The primary characteristic is the abscess formation and the subsequent draining **fistula** outside the body.
The exudate produced is a yellow puslike substance containing what is known as **sulfur granules**.

**Actinomycosis**

- Microscopic examination show yellowish sulfur granules in fluid and presence of actinomyces bacteria
- Treatment is long term, high doses of antibiotics (6mths to 1 yr)
- Surgical drainage of lesion may be required
- Diff. Diagnosis: AIDS
  - Osteomyelitis, other bacterial/ fungal organisms

**SYPHILIS**

- Caused by the microorganism spirochete "Treponema Pallidum".
- Transmitted by direct contact through break in skin, sexual contact, transfusion of infected blood, Tran placental inoculation of a fetus from infected mother

**Three stages of Syphilis**

- 3 Stages: primary, secondary, tertiary
- PRIMARY, lesion is called “Chancre” and it forms at the site at which it entered the body. (1wk.-3Mths)
- Cervical Lymphadenopathy accompanies chancre.

**“Chancre”: primary lesion**

- Commonly on the lips, followed by the tongue, palate, gingiva and tonsils
- Initially appears a small papule that elevates, enlarges, erodes and ulcerates
- The lesion is usually punched-out, indurated and 2 to 3 cm in diameter -painless
- Surface is covered by a yellowish, highly infectious serous discharge
- Chancre typically persist for 2 to 4 weeks and heal but a latent period of the disease has started and moves to the secondary stage of syphilis
- Clients may believe no need for treatment as result of chancre healing
SECONDARY—occurs 6 weeks after primary; eruptions of skin and mucous membranes. Oral lesions are mucous patches: painless, gray-white plaques covering ulcerated mucosa. Highly infectious.

Flu-like symptoms: Fever, Weight loss, headaches, Lymphadenopathy

May be rash on trunk of infected person
Saliva highly infective

TERTIARY—occurs years after initial infection if left untreated

Produces serious complications affecting multiple organs

This oral lesion is called a gumma (noninfectious)

Most common site is tongue, palate

Appears as firm mass that can become ulcer and can lead to perforation of palatal bone into nasal cavity

Diagnosis

Blood tests to confirm diagnosis

Treated with penicillin

Outcome depends on the stage of disease when detected

Tertiary stage may last for yrs and severe damage of organs may have occurred if left untreated

Differential Diagnosis

Since incidence is low, may go unnoticed and undiagnosed when seen clinically.

Termed the “great imitator” – multiple clinical manifestations

Necrotizing Sialometaplasia

Aphthous ulcers, Mucoepidermoid carcinoma, squamous cell carcinoma

Necrotizing Ulcerative Gingivitis (NUG, ANUG, TRENCH MOUTH)

Infectious disease of gingiva, causing gingival bleeding, ulceration, tissue necrosis and pain. Foul odor and metallic taste

Usually in young adults

Predisposing Factors: stress, lower resistance to disease, poor nutrition, poor OH

Characteristics may include fever, Lymphadenopathy

Dental Implications

Debridement of teeth and affected soft tissue

Proper diet, rest and stress reduction

No ultrasonic devices—minimizing aerosol production (infectious)

Salt water rinses, peroxide chlorhexidine
Osteomyelitis
- Is an inflammatory process of the bone and bone marrow caused by infection: staphylococci, streptococci, actinomyces
- Condition may be Acute or Chronic, due to the absence of treatment or the use of improper treatment
- Acute is highly destructive and most commonly from periapical abscess or it may follow a fracture of bone or surgery and also result from bacteremia
- Chronic is a long standing inflammation of bone as a result of inadequate treatment of acute condition or from long term inflammation such as Paget's disease, sickle cell disease or bone irradiation

Treatment
- Remove source of irritation: removal of tooth or teeth or Endodontic treatment and use of antibiotics may be required

Candidiasis
- Also called Moniliasis and Thrush occurring as an overgrowth of yeast like fungus Candida albicans
- Can result from many different conditions
- Most common oral infection associated with immunodeficiency

Radiographically
- Acute: no change unless disease has been present for more than 1 wk
- Chronic: diffuse irregular radiolucency that becomes radiopaque with time (Chronic Sclerosing Osteomyelitis)

Oral Diseases with Immunological Pathogenesis: Fungal Infections

Types of Oral Candidiasis
- Pseudomembranous
- Erythematous
- Chronic atrophic (denture Stomatitis)
- Chronic hyperplastic (candidal leukoplakia)
- Angular Cheilitis
Pseudomembranous Candidiasis
- White curd-like material present on mucosal surfaces - “can be wiped off”
- Underlying mucosa is erythematous, raw
- Burning sensation, metallic taste

Chronic Atrophic Candidiasis
- Most common type affecting oral mucosa (denture Stomatitis)
- Erythematous mucosa which is limited to the mucosa covered by a UPD/FUD
- May be petechiae-like of more generalized and granular
- Commonly found on palate and max. alveolar ridge
- Asymptomatic

Angular Cheilitis
- Caused by Candida organisms
- Appears as erythema or fissuring at labial commissures
- Causes: may be nutritional deficiency however most common cause is fungal

Erythematous Candidiasis
- Erythematous, painful mucosa
- May be localized or generalized

Chronic Hyperplastic Candidiasis
- Appears as a white lesion that does not wipe off the mucosa
- May appear as leukoplakia plaques
- Diagnostic feature is its response to antifungal medication
- If no response to treatment - biopsy
- No treatment may result in dysplasia and oral carcinoma

Chronic Mucocutaneous Candidiasis
- Rare, Severe condition associated with severe immunocompromised patients and fungus
- Affects skin, nails and mucous membranes
- May have chronic oral and genital Candidiasis and skin lesions
- Oral lesions appear as Pseudomembranous, erythematous, or hyperplastic Candidiasis and angular Cheilitis
**Median Rhomboid Glossitis**

- Appears as an erythematous, often rhombus-shaped flat to raised area on the midline of the posterior dorsal of tongue
- Antifungal treatment is not consistent therefore cause is not yet clear

**Viral Infections**

- Many types of PAPILLOMAVIRUS INFECTION (HPV)
- Identified in oral lesions, normal oral mucosa and implicated in neoplasia

**Appearance**

- Two types: Common and Filiform
- Common: nonpedunculated growth, rugged and whitish surface
- Filiform: White, papillary exophytic lesion
- Histologically consists of fingerlike projections of keratotic, stratified squamous epithelium
- Diagnosis—biopsy/histologic exam
- Treatment—surgical excision
- Lesions may recur

**Diagnosis and Treatment**

- Clinical exam
- Antifungal treatment to confirm diagnosis (topical and systemic)
- Muscosal smear, fungal culture and lab diagnosis

**Verruca Vulgaris**

- Also common wart, is papillary lesion caused by papillomavirus
- Often found in children and adolescents
- Is a common skin lesion, but oral lesions do occur. May be transmitted from skin to oral mucosa
- Lip most common site
- Finger sucking, nail chewing in clients with verruca on hands or fingers
Condyloma Acuminatum
- Also known as venereal wart
- Benign papillary lesion of HPV
- Transmitted sexually to oral cavity through oral-genital contact
- Appears as papillary, bulbous masses occurring anywhere in oral mucosa
- Multiple lesions may be present
- Not as keratinized as the verruca vulgaris (white)

FOCAL EPITHELIAL HYPERPLASIA
- Also called Heck disease; caused by HPV
- Characterized by multiple whitish to pale-pink nodules distributed throughout oral mucosa
- Most common in children
- Asymptomatic lesions
- No treatment—Resolve spontaneously within few weeks

Group of Herpes viruses
- Herpes simplex
- Varicella-zoster
- Epstein-Barr
- Cytomegalovirus

Histologically
- Composed of fingerlike projections of epithelium covering cores of connective tissue
- Treatment is surgical excision, recurrence is common, avoidance of oral-genital contact with infected partner

Focal Epithelial Hyperplasia

Herpes Simplex Virus
- Two major forms:
  1. Herpes simplex 1 - oral infections
  2. Herpes simplex 2 - genital infections
Oral infection occurs in an initial (primary) form and a recurrent (secondary) form
**Primary Herpetic Gingivostomatitis**

- Systemic symptoms such as:
  - Fever
  - Malaise
  - Cervical lymphadenopathy
  - These usually occur before oral manifestations

**Oral Lesions of Primary Herpetic Gingivostomatitis**

- Widespread inflammation of the marginal and attached gingiva develops and multiple tiny vesicles erupt on:
  - Perioral skin
  - Vermillion border of lips and oral mucosa
  - Vesicles progress to form ulcers
  - Painful, chewing/swallowing impaired which may result in dehydration,
  - Heal spontaneously in 1 to 2 weeks

**Demographics**

- Children between 6 months and 6 years, however may occur at any age if never been exposed to the virus
- Many individuals have antibodies to herpes simples than have a history of the disease, therefore majority of infections are thought to be undetected

**Recurrent Herpes Simplex Infection**

- HSV persists in a latent state, in the nerve tissue of the trigeminal ganglion causing recurrent infections

**Demographics of Recurrent Herpes simplex**

- One third to one half of the U.S population experience recurrent herpes simplex infection
- Episodes recur from once/month to once/year
Herpes Labialis, Cold Sore, Fever Blister
- Most common type of recurrent herpes simplex infection
- Occurs on the vermillion border of the lip

Triggers
- Sunlight
- Menstruation
- Fatigue
- Fever
- Emotional stress

Intraoral Recurrent Herpes Simplex Lesions
- Occur on attached mucosa that is fixed to bone which distinguishes them from aphthous ulcers
- Painful crops of tiny vesicles and ulcers' can coalesce to a single ulcer with an irregular border
- Pain, burning or tingling prior to vesicle development (prodomal stage)
- Heal in 1-2 weeks without scarring

Transmission of herpes Simplex Virus
- Direct contact with an infected individual
- Lesions of the primary occur at the site of inoculation
- Amount of virus present is highest in the vesicle stage

Herpetic Whitlow
- Is a painful infection of the fingers caused from Herpes Simplex virus
- Can be primary or recurrent
- Can also cause eye infection
- Infection control: mask, eye protection, gloves to prevent transmission of disease
- Do not treat clients in vesicle stages

Herpetic Whitlow
Herpes Simplex Eye Infection

Varicella-Zoster Virus
- Causes chicken pox (varicella) and shingles (herpes zoster)
- Contagious; transmitted by respiratory aerosols and contact with skin lesion secretions

Diagnosis and Treatment
- On basis of clinical characteristics
- TREATMENT: Antiviral drugs - acyclovir
- Sunscreen to prevent herpes labialis

Chickenpox
- Oral lesions occur but do not cause severe discomfort
- Skin lesions - pustular eruptions
- Systemic symptoms - headache, fever, malaise
- Usually occurs in children

Herpes Zoster/Shingles
- Same virus; different form of the disease
- Occurs in adults
- Skin lesions are:
  Unilateral painful eruption of vesicles along distribution of sensory nerve
Three branches of trigeminal nerve may be affected: Ophthalmic, maxillary, mandibular

Oral Lesions of Herpes Zoster
- Begin as vesicles that progress to ulcers, unilaterally
- Oral lesions occur when the maxillary or mandibular branches are affected
- Prodromal symptoms (pain and burning, paresthesia)
- Disease lasts for several weeks, neuralgia may take months to revolve
**Herpes Zoster**

- Based on clinical features
- Biopsy may show same type of virally altered epithelial cells as in herpes simplex infection
- Treatment of Herpes zoster:
  - Corticosteroids to prevent pain of neuralgia
  - Antiviral drugs for immunocompromised clients
- Varicella - no treatment-supportive

**Other Viral infections that may have Oral Manifestations**

- Measles (paramyxovirus)-red macules with white necrotic centers
- Mumps (paramyxovirus)-bilateral swelling of parotid glands

**Infectious Mononucleosis**

- Infectious disease caused by Epstein-Barr virus
- Characterized, sore throat, fever, lymphadenopathy, enlarged spleen, malaise, fatigue
- Oral lesions-palatal petechiae
- Contact with saliva (kissing disease)
- Resolves in 4-6 weeks

**EPSTEIN-BARR VIRUS INFECTION**

- Implicated in several diseases that occur in oral region.
- Infectious mononucleosis
- Nasopharyngeal carcinoma
- Burkitt lymphoma
- Hairy leukoplakia

**Nasopharyngeal carcinoma and Burkitt lymphoma**

- Two Rare forms of malignant neoplasms
Hairy Leukoplakia
- Irregular, corrugated, white lesion occurring on lateral border of the tongue
- Identified in patients infected with HIV

Hand - Foot and Mouth Disease
- Occurs in children under the age of 5
- Oral lesions are painful vesicles and ulcers occurring anywhere in oral cavity
- Caused by Coxsackie virus
- Skin Lesions: multiple macules or papules on feet and hands
- Lesions resolve in approx. 2 weeks

- Oral lesions resemble herpes simplex
- Clinical: Skin lesions, oral lesions, and mild systemic symptoms aid in diagnosis
- No treatment: disease of short duration