

Viral Infections

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Human Herpes Viruses

- HHV-1: Human Simplex Virus-1 (HSV-1)
- HHV-2: Human Simplex Virus-2 (HSV-2)
- HHV-3: Varicella-Zoster Virus (VZV)
- HHV-4: Epstein-Barr Virus (EBV)
- HHV-5: Cytomegalovirus (CMV)
- HHV-6: Roseolovirus
- HHV-7: Similar to HHV-6
- HHV-8: Kaposi sarcoma, lymphomas, Castleman's dz

Human Herpes Viruses

- Only in humans
- Reside for life
- Periods of latency and reactivation
- Endemic worldwide
- HSV-1,2 and VZV: neurotropic; replicate in epithelial cells
- EBV, CMV, HHV-6: lymphotropic
- HHV-6: Secreted in saliva of ~all children and in lymphoproliferative diseases of adults
- HHV-8: Identified in Kaposi sarcoma

Herpes Simplex Virus

- HSV-1 (above the waist) and 2 (genital area)
- Single-stranded DNA
- Lytic to epithelial cells; latent in nerves
- Epithelial cell death releases virions; very short life
- Can enter through areas of trauma; there is evidence that it can penetrate intact mucosa

Primary Infection

- Young age
- Low socioeconomic societies ~100% by age 30
- Higher socioeconomic societies 50-60% in adults
- Young: gingivostomatitis
- Adults: pharyngotonsillitis
- Often asymptomatic, no significant morbidity
- Transportation to the sensory ganglion (rarely autonomic)

Primary Infection

- Acute herpetic gingivostomatitis
- 12% of infected patients had recalled clinical symptoms
- 2-3 years; as old as 60 years
- Anterior cervical lymphadenopathy
- Chills and fever (104° F)
- Numerous vesicles that collapse and form small red lesions; ulcerations covered with fibrin
- Both masticatory and non-masticatory mucosa
- Edematous gingiva
- Self inoculation to other areas can occur
- Resolution: 5-15 days



Secondary Infection

- Reactivation triggered by: emotional stress, trauma, cold, sunlight, gastric upset, fever, menstrual cycle, other factors suppressing the immune system
- Incubation: 1-26 days (3-9 days)
- Altered sensation: fullness, lack of tactile sensation and sensory perception
- Vesicle formation; highly contagious
- Shedding of virus can occur without clinical disease

Secondary Infection

- Herpes labialis
- Recurrent intraoral herpes
- Prodromal symptoms and signs
 - Pain, burning, itching, tingling
 - Small vesicles





Other Clinical Presentations

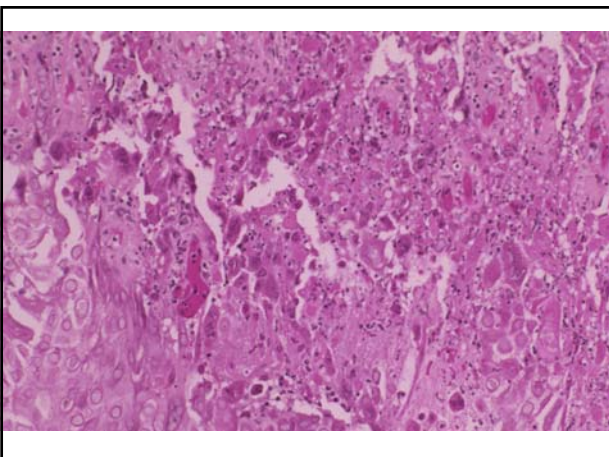
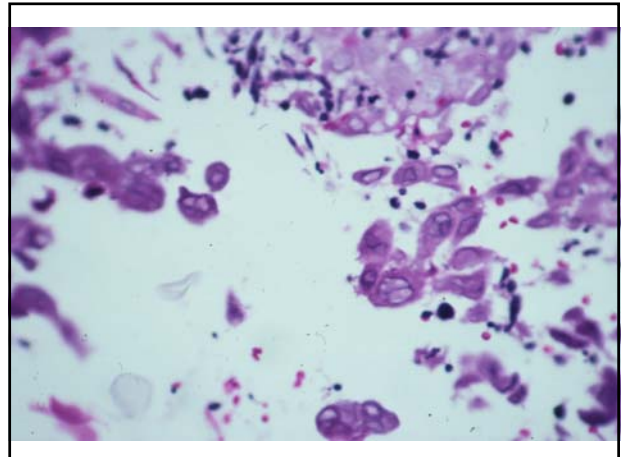
- Herpetic whitlow
- Herpes gladiatorum (scrumbox)
- Areas of chronic skin disease (pemphigus, eczema)
- Immunocompromised patients
- So-called geometric glossitis





Histologic Findings

- **Acantholysis (Tzanck cells)**
- **Ballooning degeneration**
- **Multinucleated epithelial cells**



Treatment

- **Primary**
 - Symptomatically
 - Acyclovir
 - Avoid lidocaine and aspirin in pediatric patients
- **Recurrent lesions**
 - Acyclovir (valacyclovir, famciclovir)

61 yo white female

- Low grade fever
- Malaise
- Slight cervical lymphadenopathy
- Oral “blisters” and ulcerations



Varicella Zoster Virus

- **Varicella (chickenpox)**
 - Generalized maculopapular skin rash, fever, malaise, mouth lesions
 - Rash → Vesicles & Pustules → Crust
 - Contagious until crusts form
 - Mouth; vesicular lesions
 - Adults: Complications that may lead to death
 - Infection during pregnancy may cause abortion and birth defects



Varicella Zoster Virus

- **Vs. Smallpox**
 - The lesions in smallpox are at the same stage of development throughout the body, densely concentrated in the face and extremities and deep.
 - Palms and soles are virtually never affected



Varicella Zoster Virus

- Treatment
 - Warm soap baths and oral diphenhydramine
 - Antiviral medication
 - Vaccination: 95% immunity after 7 years

Varicella Zoster Virus

- Herpes Zoster
 - Latency in dorsal spinal ganglia
 - 10-20% of individuals
 - Neuralgia that precedes rash; fever; headache
 - Affects dermatome
 - Vesicles develop (may be absent: zoster sine herpete)
 - Vesicles, pustules, crusts
 - Oral lesions: Lesions extend to the midline
 - Ocular lesions can lead to blindness



Varicella Zoster Virus

- Herpes Zoster
 - Postherpetic neuralgia
 - Light stroking of the area
 - Contact with clothes
 - Capsaicin
 - Antivirals
 - Corticosteroids for chronic pain

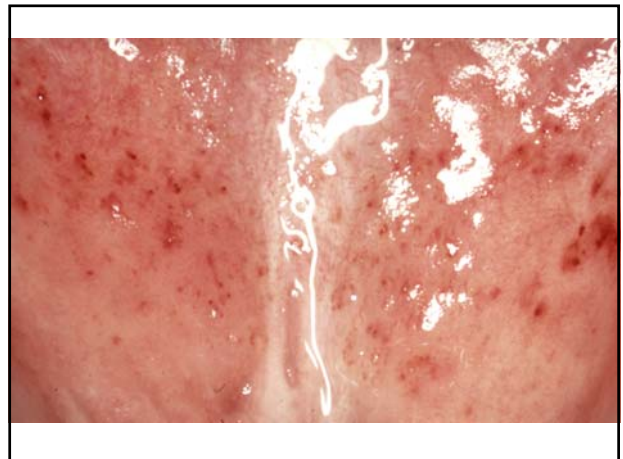
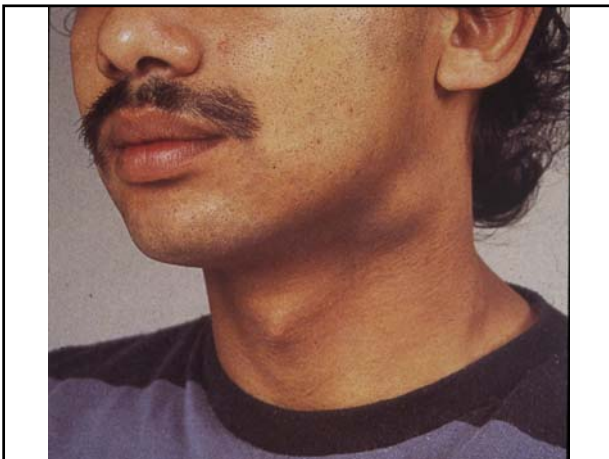
Ramsay Hunt syndrome

- Cutaneous lesions
- External auditory canal lesions
- Facial paralysis
- Hearing deficit
- Vertigo



Epstein Barr Virus

- **Infectious mononucleosis**
 - Affects B cells
 - Heterophile antibody is a byproduct of B cells that binds the Paul-Bunnell antigen of sheep and bovine RBCs.
 - B cell involvement activates T cells
 - “Kissing disease”
 - Asymptomatic in children
 - Lymphadenopathy, fatigue fever, hepatomegaly, splenomegaly
 - 4-6 weeks; lymphadenopathy and fatigue can persist for months
 - Palatal petechiae



Epstein Barr Virus

- **Infectious mononucleosis**
 - Symptomatic treatment
 - Avoid aspirin, sports (splenic rupture), corticosteroids except in life-threatening situations

Epstein Barr Virus

- Hairy leukoplakia
 - HIV(+)
 - HIV(-) immunosuppressed patients
 - HIV(-) immunocompetent patients who use steroids
 - Healthy individuals (?)



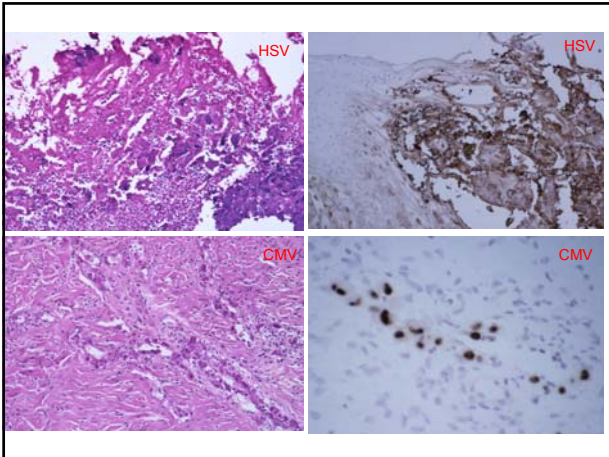
Epstein Barr Virus

- Nasopharyngeal carcinoma
 - Southeast Asia
- Gastric carcinomas
- Smooth muscle tumors
- Lymphoproliferative disorders
 - Atypical lymphoproliferative disorder
 - Lymphomas (Burkitt's lymphoma, African type)

Cytomegalovirus

- Early childhood
- Contraction during fetal development can lead to stillbirth
- Saliva, through blood-to-blood, intimate contact, transplants
- HIV/AIDS: Ulcerative lesions; associated with HSV; gancyclovir





Coxsackie Viruses

- RNA viruses
- Enterovirus family
- Two types: A(1-23) & B (1-6)
- Herpangina
- Hand-foot-mouth disease
- Acute lymphonodular pharyngitis

Herpangina

- Most cases mild and subclinical
- Cough, rhinorrhea, anorexia, diarrhea, myalgia, headache
- Red macules that lead to vesicles that break
- Look like minor aphthae
- Soft palate, tonsils
- Self-limiting



Hand-Foot and Mouth Disease

- Flu-like symptoms
- Oral and hand lesions always present
- Palms, soles, fingers
- Macules that become vesicles that ulcerate
- Mostly self-limiting disease



Acute lymphonodular pharyngitis

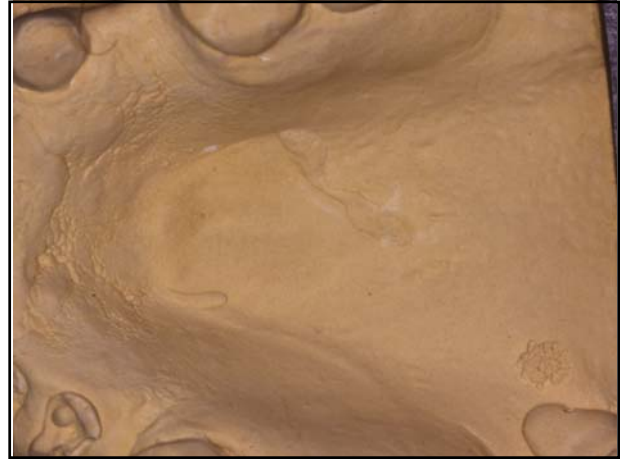
- Controversial condition
- Sore throat
- A few yellow to dark pink nodules on soft palate and tonsils
- No vesicles

Human Papilloma Virus

- Papova virus family
- DNA, double-stranded
- ~ 100 subtypes
- 24 types with lesions of the head and neck
- Tropism for epithelial cells
- Hyperplastic, dysplastic, and neoplastic lesions

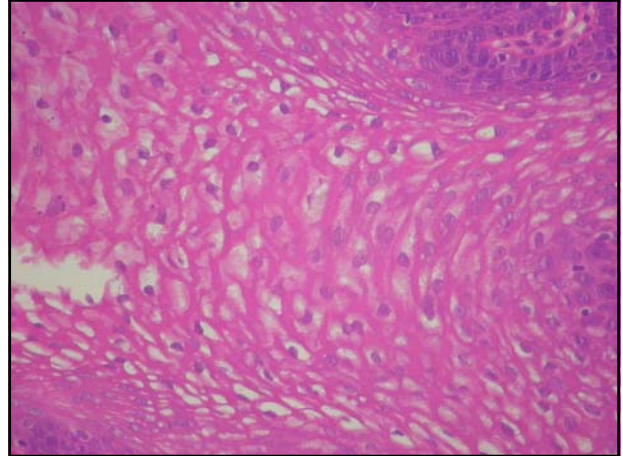
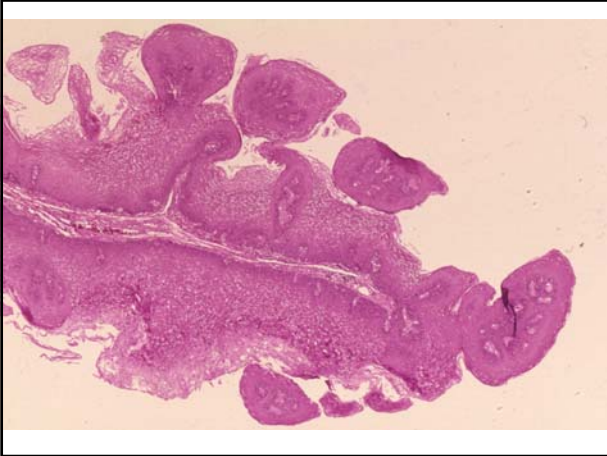
Squamous Papilloma

- HPV 6 and 11
- Most common benign neoplasm
- Soft palate, faucial pillars, uvula
- Pedunculated, exophytic, numerous finger-like projections (pointed or blunted)
- White, red, normal oral mucosa color
- Papillomatosis
- Laryngeal papillomatosis



Squamous Papilloma

- Histopathologic characteristics
 - Epithelial hyperplasia
 - Koilocytosis
 - Rich vasculature
 - Mild to moderate inflammation
- Treatment
 - Excision and histopathologic evaluation



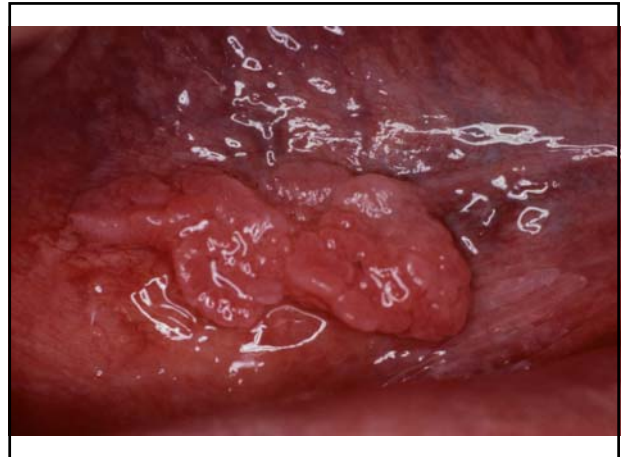
Verruca Vulgaris

- HPV 2, 4, 6 and 40
- Perioral areas, infrequent inside the mouth
- Vermilion, tongue
- Nodule with papillary projections or rough surface
- Cutaneous horn
- Treatment
 - Liquid nitrogen cryotherapy
 - Excision
 - Keratinolytic agents



Condyloma Acuminatum

- HPV 2, 6, 11, 53, 54 & **16, 18 (high risk)**
- Sexually Transmitted Disease
- **If found in children it can be an indicator of sexual abuse**
- Oral and anogenital lesions concurrently
- Lips, soft palate, lingual frenum
- Cluster lesions
- Treatment
 - Excision



Focal Epithelial Hyperplasia (Heck's disease)

- HPV 13 and 32
- Children; immunocompromised patients
- Some populations show high prevalence
- Multiple lesions spread on lips, tongue, gingiva, tonsils
- Papules; pale or white; clustering
- Treatment
 - Spontaneous regression
 - Conservative excision

