

## Sexually Transmitted Diseases and Dentistry

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# Some of the many oral manifestations of HIV/AIDS

#### Infections

- Bacterial especially NUG
- Fungal especially Candidiasis
- Viral especially Herpes, EBV (Hairy Leukoplakia), HPV
- Enlargements
  - Parotid
  - Lymph nodes

- Aphthous-like ulcers
- Dry mouth
- Malignancies
  - Squamous cell CA
  - Lymphoma
  - Leukemia
  - Kaposi Sarcoma

#### HIV and Salivary Glands

- 5% of HIV+ patients have painless bilateral parotid enlargement
  - Parotid lymph nodes enlarge during HIV disease, may become cystic
- Also, independently, there may be low salivary flow with or without HAART

Kumar and Sharma. *Parotid lymphoepithelial cysts as an indicator of HIV.* J Can Dent Assoc. 2011;77:b28 Navazesh et al. *Effect of HAART on salivary gland function in the Women's Interagency HIV Study (WIHS).* Oral Dis. 2009 Jan;15(1):52-60. Epub 2008 Nov 11

### Lab tests – get latest from MD

#### Infection risks

– HIV Status Update: CD4 Count, Viral Load

- Blood Cell Status: CBC with Differential

#### • Bleeding risks

- Platelet Count (may be depressed in HIV)
  - Clinical signs of thrombocytopenia including bruising of skin and/or oral mucosa, and prolonged bleeding after a minor cut
- INR
- Liver Function Tests
  - Hepatitis, consumption of alcohol or other recreational drugs, are all associated with liver damage

#### CD4 Count – What's what?

HIV Status	CD4 Count
Healthy	>500
Asymptomatic	
Symptomatic	200-499
AIDS	<200

Normal CD4 Count	Men = 400-1200 Women = 500-1600
CD4 Count	Associated Problems
>300	Very few except increased risk of malignancies (KS, lymphoma etc) at any CD4 count
200-300	Water and food-borne illnesses
<200	Pneumocystis Pneumonia
<100	Atypical TB, toxoplasmosis
<50	CMV, all other infections

### Significance of Viral Load

- Measures the success or failure of retroviral therapy (HAART)
- Indicates the level and rate of viral replication
- Helps predict future immune suppression
- The higher the viral load, the faster HIV disease is progressing, and the worse the chance of longer-term survival

#### Need for antibiotic therapy is based on Neutrophil Count, not CD4 count

- Check with MD team if CD4 count is <200
- If Neutrophil Count is 500-1000, then antibiotic therapy is strongly encouraged
- If neutrophil count is <500, antibiotic prophylaxis is mandatory</li>
- Other indications include
  - Needed under AHA guidelines for heart disease
  - Dialysis catheter
  - Indwelling venous access lines

#### HAART

- HAART can significantly affect drug-drug interactions, especially through the Cytochrome p450 pathway
- Drug elimination may be faster OR slower.
- There are many side effects of HAART treatment as well as numerous potential drug interactions.
- For current information on the medications that your patient is taking, consult a good drug reference.

# Can dentists perform salivary HIV testing?

- 25% of HIV+ patients in USA unaware
- Rapid HIV test using oral fluids
- Results in <20 minutes
- Sensitivity and specificity comparable to blood testing
- Preliminary positive test gets confirmed by Western Blot at MD office

Vernillo and Caplan. Routine HIV testing in dental practice: can we cross the Rubicon? J Dent Educ. 2007 Dec;71(12):1534-9.

#### But will we?

- But who pays?
- Perceived as dentist's job?
- Are dentists adequately trained?
- Are we able to deliver bad news?
- Do we have the resources for immediate referral to MD for confirmatory testing?

Vernillo and Caplan. *Routine HIV testing in dental practice: can we cross the Rubicon?* J Dent Educ. 2007 Dec;71(12):1534-9.

#### Human papillomavirus

- 120+ types
- Cause epithelial proliferation skin or mucosa
- Readily transmissible (casual or sexual)
- Most sexually active people have been exposed to at least one type
  - At least 70 percent of sexually active persons will be infected with genital HPV at some time in their lives, says National Cancer Institute

#### High Risk HPV

Sexually Transmitted

- A growing risk factor: "high-risk" HPV types 16, 18, 31, 33
- Known to be involved in most cervical cancer and often rectal
- Newer: Base of tongue, oropharynx, tonsils and tonsillar pillars associated with HPV-16
- About 5-10% of tongue cancers are thought to be associated with "high-risk" HPV

Fakhry C, Gillson M. Clinical Implications of Human Papillomavirus in Head and Neck Cancers. Journal of Clinical Oncology, Vol 24, No 17 (June 10), 2006: pp. 2606-2611

- HPV type 16, 33, or 35 was specifically located within tumor cell nuclei of 61% of oropharyngeal cancer patients.
- All patients with laryngeal cancer were HPV negative

D'Souza G et al. Case-Control Study of Human Papillomavirus and Oropharyngeal Cancer. N Engl J Med 2007;356:1944-56.

 A high lifetime number of vaginal-sex partners (26 or more) was associated with oropharyngeal cancer (odds ratio, 3.1; 95%) confidence interval [CI], 1.5 to 6.5), as was a high lifetime number of oral-sex partners (6 or more) (odds ratio, 3.4; 95% Cl, 1.3 to 8.8), with or without the established risk factors of tobacco and alcohol use.

# Is HPV-associated cancer a different disease?

- HPV infected HNSCC patients tend to be younger, nonsmokers, and nondrinkers.
- "There is sufficient evidence to conclude that a diagnosis of HPV-positive HNSCC has significant prognostic implications; these patients have at least half the risk of death from HNSCC when compared with the HPVnegative patient."

# How does "high-risk" HPV cause cancer?

- Small, nonenveloped, circular double-stranded DNA virus
- Attracted to squamous epithelial cells
- Enter into basal cells
- Transported to nucleus



#### Virus Disables Suppressors





### HPV and carcinogenesis

- HPV's E7 gene can bind to Rb gatekeeper off duty!
  - uncontrolled cell reproduction
- HPV's E6 protein can bind to p53
  - Repeated replication of cells with incorrect DNA information
  - No apoptosis of mutated cells
- HPV's E6 can also activate telomerase
  - maintains a repeated cell cycle that continues to produce viral cells.
  - mutant cells continue to reproduce out of control.



LMS'98

immunosuppression

#### HPV Vaccines: 2 types

- BIVALENT
  - Effective against HPV 16 and 18 ("high risk") but NOT against HPV 6 and 11 (genital warts)
- QUADRIVALENT
  - effective against HPV 16 and 18 ("high risk") as well as HPV 6 and 11 (genital warts)
- But surveillance for cancer is still important

#### Consensus: Tonsils, Posterior Palate, Base of Tongue

- Competent examination includes attempting to visualize and palpate these areas, BUT we acknowledge that this is often not possible.
- If a lesion is suspected here, referral to otolaryngology or other specialty is recommended

# Consensus, Oral and Maxillofacial Section, ADEA 2010

 The patient history should include a discussion of possible exposure to high-risk types of HPV, and safer sex practices, for all patients judged to be sexually active Can dentists counsel their patients about safer sex - and will we?

- HPV is issue in oral cancer prevention
- The "Yecch" factor
- No training in most dental programs
- Job for educators
- Embarrassed dentist = embarrassed patient

#### Verruca vulgaris

- Common wart
- Sessile hairy-looking white lesion/s
- Elevated with discrete borders and a flat verrucous top (Jughead's hat)
- HPV types 2, 4, and 40
- But not high risk HPV!





Not Sexually

**Transmitted** 



- On skin:
  - surgical excision, liquid nitrogen, or keratinolytic agents.
- Intraoral:

surgical excision, cryotherapy or electrosurgery.

• 2/3 disappear spontaneously

### Papilloma

Not Sexually Transmitted

- Common benign pedunculated lesion
- Cauliflower-like surface BUT often indistinguishable from Verruca Vulgaris
- Soft palate, tongue, uvula or anywhere
- Usually pink in colour
- Relation to Human Papilloma Virus 6+11? Unproven.
   But not high risk HPV!





### Condyloma acuminatum

Sexually Transmitted

- Also known as Venereal Warts
  - HPV 6 and 11; (sometimes 16 and 18)
  - But not high risk HPV!
- Infectious can spread to other people and other sites
- Small and sessile to large
- Papillary proliferations with a cauliflower-like shape
- Larger than papillomas, often multiple



Photo by Dr AK ElGeneidy

- Should be surgically excised.
  - Some types of laser removal may spread the virus to other sites or surgical personnel through aerosol.



But – not high risk HPV!

### Verruca

Upside down V HPV 2, 4

Condyloma

Sideways C HPV 6, 11

#### Papilloma Pedunculated like P

## Heck's Disease Focal Epithelial Hyperplasia

Not Sexually Transmitted

No

increased

cancer

- First described in 1965 in Native Americans
- In some isolated populations up to 40% of children have been affected
- Adults usually have minimal symptoms
- Caused by HPV 13 and 32
- But not high risk HPV!

- Flat, smooth, soft, papules
- Same color as surrounding mucosa usually
- No ulceration
- No malignant transformation potential
- Usually a self-limiting viral infection

- Can mimic condyloma
   acuminatum
- Important distinction in children: sexual abuse
- Can be more florid and persistent in HIV+ patients
- May be removed surgically if they interfere with function

### **HPV Significance for Dentistry**

- Growing numbers of HPV+ cancers in oropharynx and in non-smokers
- Careful exam including entire tongue, tonsils, base of tongue, posterior pharynx
- Consider referral to general health team for positive extraoral findings
- Preventive counseling including oral safer sex
- Encourage younger patients to have HPV vaccine
- Continue to stress tobacco as #1 cause of intraoral CA

#### Gonorrhea

Sexually Transmitted

- Common sexually transmitted infection
- Caused by Neisseria gonorrhoeae, Gram-negative intracellular diplococcus
- Risk factors:
  - Multiple or new sex partners, inconsistent safer sex
  - City living in areas with disease prevalence
  - Adolescents, females particularly vulnerable
  - Lower socio-economic status
  - Use of drugs
  - Exchange of sex for drugs or money

#### Transmission

- Efficiently transmitted by
  - Male to female via semen
  - Vagina to male urethra
  - Rectal intercourse
  - Fellatio (oropharyngeal infection)
  - Perinatal transmission (mother to infant)
- Gonorrhea associated with increased transmission of and susceptibility to HIV infection

## Gonococcal Infection in Men

- Urethritis Inflammation of urethra
  - Purulent or mucopurulent urethral discharge
    Often dysuria painful urination
- Epidymitis Inflammation of epididymis
- Asymptomatic in a minority of cases
- Incubation period: usually 1-14 days for symptomatic disease, but may be longer

### Gonococcal Infection in Women

- Most infections are asymptomatic
- Cervicitis inflammation of the cervix
- Urethritis inflammation of the urethra
  - Dysuria (painful urination) but most women are asymptomatic
  - 70%–90% of women with cervical gonococcal infection may have urethral infection
- Accessory gland infection
  - Bartholin' s glands
  - Skene' s glands
- Pelvic Inflammatory Disease (PID)

## Oral & Pharyngeal Infection

- May be sole site of infection if oral-genital contact is the only exposure
- Most often asymptomatic, but symptoms may include pharyngitis, tonsillitis, fever, and swollen lymph nodes

Prevention

CDC.gov

#### Partner Management

- This is a reportable disease all confirmed cases must be reported to the local Health Department, which will take care of partner notification.
- Partners need to be tracked down, checked for disease, and offered appropriate treatment and/or counseling.

## Syphilis

Sexually Transmitted

- Common
- Sexually acquired infection
- Etiologic agent: Treponema pallidum
- Disease progresses in stages
- May become chronic without treatment
- Can have significant oral lesions

#### Pathogenesis

cdc.gov

## Microbiology

- Etiologic agent: *Treponema pallidum* 
  - Corkscrew-shaped, motile microaerophilic bacterium
  - Cannot be cultured in vitro
  - Cannot be viewed by normal light microscopy
- Most contagious to sex partners during the primary and secondary stages



cdc.gov

### Pathology

- Penetration:
  - *T. pallidum* enters the body via skin and mucous membranes through abrasions during sexual contact
  - Transmitted transplacentally from mother to fetus during pregnancy
- Dissemination:
  - Travels via the lymphatic system to regional lymph nodes and then throughout the body via the blood stream
  - Invasion of the CNS can occur during any stage of syphilis



Chancre (male or female genitalia)

Lymphadenopathy Rash: palms, soles

Paralytic dementia Aortic aneurysm Aortic insufficiency Tabes dorsalis Gummas (widespread)

#### Figure 9-13. Clinical characteristics of the various stages of syphilis.

cdc.gov

## Primary Syphilis

- Appears 1-3 weeks after contact
- Primary lesion "chancre" develops at site of inoculation
- Chancre:
  - Progresses from macule to papule to ulcer
  - Typically painless, indurated, and has a clean base
  - Highly infectious
  - Heals spontaneously within 1 to 6 weeks
  - 25% present with multiple lesions
- Regional lymphadenopathy: classically rubbery, painless, bilateral
- Serologic tests for syphilis may not be positive during early primary syphilis

# Primary Syphilis Lesion - Tongue

**Clinical Manifestations** 

Source: CDC/ NCHSTP/ Division of STD Prevention /STD Clinical Slides

cdc.gov

#### Secondary Syphilis

- Secondary lesions occur 3 to 6 weeks after the primary chancre appears; may persist for weeks to months
- Primary and secondary stages may overlap
- Mucocutaneous lesions most common
- Manifestations:
  - Rash (75%-100%)
  - Lymphadenopathy (50%-86%)
  - Malaise
  - Mucous patches (6%-30%)
  - Condylomata lata (10%-20%)
  - Alopecia (5%)
- Serologic tests are usually highest during this stage



#### **Clinical Manifestations**

### Secondary Syphilis: Palmar/Plantar Rash



Source: Seattle STD/HIV Prevention Training Center at the University of Washington, UW HSCER Slide Bank



Source: CDC/NCHSTP/Division of STD Prevention, STD Clinical Slides

**Clinical Manifestations** 

#### Secondary Syphilis: Generalized Body Rash



Source: Cincinnati STD/HIV Prevention Training Center

*Source*: CDC/NCHSTP/Division of STD Prevention, STD Clinical Slides



(c) University Erlangen, Department of Dermatology Phone: (+49) 91:31-85 - 2727

#### **Bristol Biomedical Image Archives**

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# Tertiary (Late) Syphilis

- ~ 30% of untreated patients progress to tertiary stage within 1 to 20 years
- Rare because of the widespread availability and use of antibiotics
- Manifestations
  - Gummatous lesions
    - Gummatous necrosis at the center of granulomas
    - Many different sites
    - Can cause perforation of hard palate
  - Cardiovascular syphilis
  - Neurosyphilis

#### **University of Illinois at Chicago**

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## Neurosyphilis

- Occurs when T. pallidum invades the CNS
- May occur at any stage of syphilis
- Can be asymptomatic
- Early neurosyphilis occurs a few months to a few years after infection
  - Clinical manifestations include acute syphilitic meningitis, meningovascular syphilis, ocular involvement
- Late neurosyphilis occurs decades after infection and is rarely seen
  - Clinical manifestations include general paresis, tabes dorsalis, ocular involvement

#### **Aortic aneurisms**

- In ascending aorta (unusual site)
- Can lead to Aortic Valve insufficiency
- Can rupture and cause death

#### Luetic Glossitis

- Dorsal tongue
- Reported increase in cancer risk
- Uncommon now: Arsenic no longer used, and antibiotics very effective

cdc.gov

## **Congenital Syphilis**

- T. pallidum transmitted from a pregnant woman to fetus
  - Transmission can occur during any stage of syphilis; risk is much higher during primary and secondary syphilis
  - Fetal infection can occur during any trimester of pregnancy
- May lead to stillbirth, neonatal death, and infant disorders including deafness, neurologic impairment, and bone deformities
- Wide spectrum of severity; only severe cases are apparent at birth

#### **Orofacial changes in congenital** syphilis

- Mucous patches
- Rhagades: fissures at commissures
- Frontal bossing
- Short maxilla
- Increased cleft palate
- Saddle nose

#### Hutchinson's Triad – classic for Congenital Syphilis

- Deaf VIII nerve damage
- Blind corneal scarring, interstitial keratosis
- Teeth
  - Hutchinson's Incisors (screwdriver)
  - Mulberry Molars (complex occlusal)

#### **Bristol Biomedical Image Archives**

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#### Reporting

- Laws and regulations in all states require that persons diagnosed with syphilis are reported to public health authorities.
   Reporting can be provider or laboratory based.
- The follow-up of patients with early syphilis is a public health priority.

#### Conclusions

- HIV, HPV, Syphilis, and Gonorrhea are all STDs that can have significant oral findings and significance for dental management
- Dentists do not need to "do it alone" and should work with the medical team
- We need to do a great job in detecting these diseases
- We should consider our expanding role in preventing them
- We need to be able to educate our patients about them

#### For more information on:

- HIV and Dentistry
  - HIV/AIDS Training for General Dentistry, by Sara Gordon and Mark Schubert 2015 at<u>https://softchalkcloud.com/lesson/qr96e1aKv5Th8l</u>
- Safer Oral Sex Techniques
  - Brown University <u>http://www.brown.edu/Student\_Services/Health\_Services/</u>
- Viral Infections of the Mouth
  - Viral Infections of the Mouth, by Sara Gordon et al, WebMD, 2014 at <u>http://emedicine.medscape.com/article/1079920-</u> <u>overview</u>