A Mixed Bag of Practical Oral Lesions in Tots & Teens: Diagnostic Tips & Treatment Options

Catherine M. Flaitz, DDS, MS
Professor, Oral & Maxillofacial Pathology
University of Colorado School of Dental Medicine
Catherine.flaitz@cuanschutz.edu

March 2020

Course Objectives
Improve the practitioners' ability to:
- Diagnose a variety of common oral lesions in children
- Discover useful new entities and new findings about well-known disorders
- Select the best management approaches for the child-patient

Selected References
- The Handbook of Pediatric Dentistry. 5th ed. AJ Nowak and PS Casamassimo. AAPD, Chicago, 2018

What's New In The Bag?
- Aphthous ulcer
- HSV lesions
- Trauma
- Migratory glossitis
- Candidiasis
- Ulcer
- Cheilitis
- Hyperkeratosis
- Tobacco-induced
- Melanotic macule
- Hairy tongue
- Fordyce granules
- HPV lesions
- Mucocele
- Fissured tongue
- Nevus
- Coated tongue
- Commissural lip pits
- Other
- Tumors

Benign Migratory Glossitis
- Geographic tongue, lingual erythema migrans
- Cause: Unknown; genetic, allergy
- Prevalence: Up to 3%; all ages; | in children
- Site: Tongue, esp. dorsum; extraglossal
- Duration: Persistent; waxes and wanes
- S/S: Multiple, red annular patches with white scalloped border; loss of filiform papillae; +/- burning sensation; +/- fissured tongue
- Concerns: Food restrictions; cosmetic concern
Benign Migratory Glossitis

Concurrent lesions:
- Fissured tongue
- Crenations on lateral borders
- Lingual papillitis

Early age onset of BMG may be a marker for psoriasis and disease severity

Common mutation between generalized pustular psoriasis (GPP) & BMG – IL36RN
In BMG, IL36RN mutation was autosomal dominant with 70% penetrance

BMG may be part of disease spectrum, DITRA (Deficiency of interleukin 36 receptor antagonist): genetic, autoinflammatory syndrome characterized by recurrent, severe flares of GPP and high fever, asthenia, and systemic inflammation.

Benign Migratory Glossitis

- Early onset may be marker for psoriasis & disease severity
- BMG tends to be nontender when associated with psoriasis

Geographic Tongue

Mimics: Candidiasis, lichen planus, allergic reaction, leukoplakia, erythroplakia

Questions to Ask?
- Does it come and go and change patterns?
- Is it usually on the tongue?
- Does the child have allergies, eczema, asthma, or other skin problems?
- Does it interfere with eating? Is the child a picky eater?
- Sensitive to oral hygiene products?
- Other family members affected?
- What makes the tongue feel better?

Extraglossal Erythema Migrans

Mimics: Purpura, allergic reaction, bleeding disorder
Benign Migratory Glossitis (Weak Evidence)

ID factor; use gentle oral hygiene products
Topical coating agents, anesthetics:
- Benadryl & Maalox suspension
- OTC gels, rinses, pain-relievers
Topical steroids +/- antifungals:
- Flucinonide gel 0.05%
- Other topical steroids
- Triamcinolone 0.1% in Nystatin oral rinse (must be compounded)

What Else Is In The Bag?
- Benign migratory glossitis
- Contact allergy
- Candidiasis
- Traumatic erosion
- Transient lingual papillitis
- Glossitis due to Vitamin deficiency (Vitamin B)
- Lichen planus
- Erythroplakia

Transient Lingual Papillitis
- Lesion: Inflamed fungiform papillae
- Cause: Unknown, trauma, allergy/sensitivity, GERD, hormonal, URI, viral infection.
- Gender/Age: F>M; Wide age range
- Site: Dorsal tongue; Anterior, lateral
- Duration: 1 to 7 days
- 3 types: Single, diffuse or clustered
- S/S: Painful, red or white papules +/- fever, lymphadenopathy, may recur
- TX: Topical steroids, anesthetics, coating agents

Median Rhomboid Glossitis
- Form of candidiasis
- AKA: Central papillary atrophy
- Site: Midline, posterior dorsal tongue
- S/S: Red or white rhomboid patch, nontender
- Kissing lesion on palate
- Tx: Antifungal agents

Red midline patch
Coated tongue
Viscous saliva

Oral Candidiasis
- Cause: Candida species, Candida albicans
- Prevalence: 40 – 60% normal oral inhabitant
- Predisposing factors: ↓ immune status, medications, poor oral hygiene, appliances, pacifiers, poor diet, diabetes, dry mouth
- Site: Usually multifocal oral involvement
- Variants: Pseudomembranous, erythematous, hyperplastic types
- S/S: Red or white patches, erosions, burning sensation, taste perversion, sore throat
Erythematous Candidiasis

- Dentinal caries are a reservoir for fungus
- Gingivitis, glossitis, palatal erythema, shagged lips
- Mimics: allergic reaction, viral infection, mucosal purpura

Pseudomembranous Candidiasis

Severe forms may be associated with painful mucosal erosions and dysphagia.

Pigmented Candidiasis

- May trigger inflammatory melanosis in children of color

Oropharyngeal Candidiasis

**Topical Agents:**
- Nystatin suspension 100,000 U/mL
- Clotrimazole troches 10 mg
- Oravig (miconazole) buccal tabs 50 mg
- Chlorhexidine oral rinse 0.12% (rare severe allergic reaction)

**Systemic Agents:**
- Diflucan, g (fluconazole) 100 mg tabs, 10 mg/mL, 40 mg/mL susp
- Sporanox (itraconazole) 100mg/10mL

New Treatments in the Bag
New Drug for Candidiasis

- Oravig (Miconazole Buccal Tab): Topical
- Form: Adherent, slowly dissolving 50 mg tab
- Usual dosage: 50 mg tablet
- Adolescents >16 yrs: 1 tablet for 14 days. Apply to the upper gum region, just above the upper lateral incisor. Alternate sides of the mouth.
- Contains milk protein
- Cost: 50 mg (14): $1004.93

Questions to Ask?

- Has the child been sick recently?
- Did it occur after using a new medication?
- Has it happen before?
- Does the child have diaper rash?
- Does the child use a pacifier, wear a mouth piece or removable orthodontic appliance?
- Does it interfere with eating?
- Bad taste in mouth?

New Findings in the Bag

- Probiotics and Oral Health
  - Probiotics: Living microorganisms (primarily bacteria) that are safe for consumption and when ingested in sufficient quantities have beneficial effects on human health beyond basic nutrition
  - Probiotic species: Lactobacillus spp., Bifidobacterium spp., Saccharomyces spp.
  - Preventive effect: Candida colonization
  - Population: Preterm neonates and elderly
  - Systematic reviews:

What Else Is In The Bag?

- Pseudomembranous candidiasis
- Mucosal sloughing
- Mucosal burn
- Plaque/materia alba
- Koplik spots
- Sucking keratosis in infants

HX: Infant had 3 rounds of Nystatin with no resolution
**Breastfeeding Keratosis**
- Frictional keratosis
- Cause: Forceful sucking
- Site: Labial mucosa, anterior buccal mucosa
- S/S: White adherent plaques, nontender; +/- leukoedema, sucking calluses
- Tx: Modify sucking habits
- Mimics: Candidiasis

**Measles (Rubeola)**
- Highly contagious infection, Paramyxovirus
- Spread: Respiratory droplets; incubation - 14 d
- Contagious 4 days before rash – 4 days after
- Stage 1: 3 Cs: Coryza (runny nose), cough, conjunctivitis with fever (Koplik spots)
- Stage 2: Morbilliform rash – starts on face
- Stage 3: Rash fades, skin desquamation
- Tx/Prog: MMR, MMRV vaccine; 40% complications

**Measles: Oral Lesions**
- Koplik Spots: Small, blue-white macules (grains of sand) with erythema on buccal mucosa
- Palatal Erythema: Other signs: Lymphoid hyperplasia, NUG, NS, candidiasis

**Measles (Rubeola)**
- New cases: 1,282 (December 2019) / 372 (2018)
- Important: 28% of children <5 years hospitalized
- Not obligated to treat unvaccinated children (CDA, 2019)

**New and Old Crazes in the Bag**
- Lip Suction Trauma:
  - Cause: Forceful pressure to lips
  - Examples:
    - Sucking on a cup
    - Lip plumbing devices
    - Respiration for CPR
    - Forceful kissing
    - Orogenital sex
  - No treatment; resolve in 2-7 days

**Measles (Rubeola)**
- New cases: 1,282 (December 2019) / 372 (2018)
- Important: 28% of children <5 years hospitalized
- Not obligated to treat unvaccinated children (CDA, 2019)
Submucosal Hemorrhage

- Entrapment of blood in the tissues
- Terms: Petechiae, purpura, ecchymosis, hematoma
- Causes: Traumatic and nontraumatic
- Nontraumatic causes: Blood dyscrasias, viral infections (IM, measles), anticoagulants

Focal Ulcers of Sudden Onset

- Single or localized lesions of acute onset
- Usually shallow ulcers
- Tender to painful
- Duration is usually <2 wk
- Usually recurrent pattern
- Most are site-specific
- Frequent familial history
- Very common diseases

Aphthous Stomatitis

- T cell-mediated immunologic reaction
- Prevalence: 20-30% of US children
- Causes: Immune defect, genetics, ↓ mucosal barrier, ↑ antigenic exposure, nutritional (↓ B1,2,6,12, folate, iron, zinc)
- Site: Nonkeratinized oral mucosa
- Duration: 2 days to 6 weeks
- Types: Minor, major, herpetiform
- S/S: Single or multiple painful ulcers; sudden onset

Aphthous Minor: 80%

- Findings: 1-3 ulcers, <1 cm in size that heal in 7-10 days without scarring; variable recurrence rate

Aphthous Major: 10%

- Findings: Single to several ulcers that are deep and >1 cm.
- Prolonged healing > 2 weeks with scarring

Herpetiform Aphthae: 10%

- Findings: 10-100 ulcers that are 1-3 mm in size, may develop in waves
- Variable healing pattern and may scar
Aphthous Stomatitis
- Hematologic abnormalities in children: 20%
- Laboratory Studies:
  - White blood cell count and differential
  - Hematocrit and hemoglobin
  - Red blood cell count
  - Erythrocyte sedimentation rate
  - Serum ferritin, B12, folate
  - Antigliadin, tissue transglutaminase Ab, endomysial Ab

Potential Allergens for Aphthae
- Food: Chocolate, coffee, peanuts, almonds, strawberries, cheese, tomatoes, citrus, wheat
- Other: Benzoic acid, cinnamaldehyde, sodium lauryl sulfate, menthol, peppermint, eugenol, Balsam of Peru
- Medications: NSAIDs
- Metals: Nickel, chromium

What’s New In The Bag?
- Genome Wide Analysis for Mouth Ulcers
  - Source: UK Biobank and 23andMe meta-analysis
  - GWAS: n=461,106
  - Heritability: 8.2%
  - 97 genetic variants with mouth ulcers
  - Important genetic variants associated with IL12A and IL10
  - Supports role of T cell regulation in etiology of mouth ulcers
  - Dudding T et al. Nature Communications 2019

Questions to Ask?
- Recurrence rate, duration, location, other sores on body?
- Any known allergies? Food likes and dislikes?
- Weight loss? Growth rate?
- Meds, OTC products, oral hygiene products
- Any other family member get them?
- Any oral habits? What else put in the mouth?
- Any stomach, joint, bowel, bruising problems?
- Headaches, dizziness, fever, swollen glands?
- Bad taste? Hot burps?

Aphthae & Systemic Disorders
- Periodic fever, aphthous, pharyngitis, adenitis
- Gastroesophageal reflux disease
- Crohn disease, ulcerative colitis
- Celiac disease
- Neutropenia, anemia
- Immunodeficiency syndromes
- Reactive arthritis
- Nutritional deficiency
- Bechet disease
GERD: Oral Ulcers & Erosions

Ulcers tend to occur in posterior of mouth

OTC Products for Oral Ulcers

Aphthous Ulcers: Topical Agents

- Bioadherent OTC anesthetic or coating agents
- Triamcinolone in dental paste 0.1%
- Betamethasone valerate ointment 0.1%
- Fluocinonide gel, ointment .05%
- Temovate (clobetasol) gel, ointment .05%
- Low-level laser

Aphthous Stomatitis

Topical or systemic agents:

- Dexamethasone elixir, solution 0.5mg/5mL
- Celestone (betamethasone) syrup 0.6mg/5mL

Systemic agents:

- Prednisone 20 mg tabs (20-60mg/day) X 5 days
- Cimetidine 300 mg tabs, solution

Nutritional supplement:

- Vitamin B12 1000 mg (SL, PO)
- Peridin-C (citrus bioflavonoids + ascorbic acid)

Natural agent: Honey (>1 YO)

What’s New In The Bag?

New Systemic Drug for Aphthous Ulcers

- Otezla (apremilast) by Celgene
- Disease-modifying Antirheumatic Drugs
- Indications: psoriatic arthritis, plaque psoriasis, Behcet syndrome, oral ulcers
- Dosage for oral ulcers: 30 mg BID, 2-6 wk
- Not approved for pediatric use < 18 YO
- Cost: $3398/mo
What Else Is In The Bag?

- Aphthous minor ulcer
- Traumatic/factitial ulcer
- Recurrent HSV infection
- Transient lingual papillitis
- Superficial mucocele
- Contact allergy
- Systemic diseases

Celiac Disease

- Genetic immune-mediated enteropathy
- Trigger: Gluten grains (wheat, barley, rye)
- Prevalence: 5% to 1% (1 in 100)
- S/S: GI distress, anemia, joint pain, fatigue, asthma, short stature, arthritis, vitamin K deficiency
- Oral S/S: Enamel hypoplasia, oral ulcers, gingivitis, dry mouth
- Tests: IgA antihuman tissue transglutaminase (TTG), IgA endomysial antibody IF (EMA), antigliadin AB
- Risk: DM, type I, SS, osteoporosis, lymphoma

Celiac Disease

- Mild enamel hypoplasia
- Resolving tongue ulcer
- Mucosal pallor

Celiac Disease

- 3 YOWF with oral ulcers, erosions, lichenoid mucositis
  Duration: 1 year of recurrent oral problems

Oral Fixed Drug Eruption

- FDE is a recurrent site-specific lesions of the skin and/or mucosa when a drug is taken
- Age: Wide age range, including <10y
- Oral lesions occur alone (14%) or with genital, ocular, nasal or skin lesions
- Site: Tongue, palate, labial mucosa
- S/S: Ulcers, erythema, bullae +/- pigmentation
- Drugs: Naproxen, co-trimoxazole, fluconazole, tetracyclines, ibuprofen, clarithromycin
- Tx: ID and DC drug; palliative care

Oral Fixed Drug Eruptions

- 3 YOM taking Bactrim for otitis media
Secondary HSV Infection
- **Cause:** Reactivation of HSV-1
- **Types:** Herpes labialis, facialis, intraoral HSV
- **Prevalence:** 20-35%; ↑ with lower SES
- **Risk factors:** UV light, trauma, fever, teething, menses
- **Site:** Perioral skin, vermilion, gingiva, hard palate
- **Duration:** 7 - 14 days
- **S/S:** Recurrent, acute onset, prodromal redness, tender, clustered vesicles & ulcers, referred pain
- **Complication:** Scars, erythema multiforme, Bell’s palsy, herpetic whitlow, blindness

Herpes Labialis & Facialis
- **Recurrent Intraoral HSV**
  - Distribution: Follows an affected nerve to midline
  - **S/S:** Burning, tingling, itchy sensation; painful cluster of vesicles, ulcers
  - **Mimics:** Herpes zoster
  - **ID:** the trigger; may be dental treatment
  - **Tx:** Antivirals, palliative

What’s New In The Bag?
- **New Pattern: Zosteriform HSV**
  - **ID:** 20 YO healthy woman
  - **CC:** Very tender gingiva of sudden onset, but no fever, malaise or lymphadenopathy

Zosteriform HSV
- **ID:** 20 YO healthy woman
- **CC:** Very tender gingiva of sudden onset, but no fever, malaise or lymphadenopathy
- **Tx:** Palliative
**Recurrent HSV & Dental Trauma**

- **New Drug for Herpes Labialis**
  - Sitavig (acyclovir buccal tab): Transmucosal
  - Form: Adherent, slowing dissolving 50 mg
  - Usual dosage: 50 mg tablet
  - Adults: 1 tablet as a single dose placed on the upper gum region (canine fossa).
  - Contains milk product
  - Cost: 50 mg (2): $1070.00

- **New OTC Cold Sore Meds**
  - Lidocaine with botanicals, aloe
  - Benzyl Alcohol 1.0%, aloe vera, green tea extract
  - Docosanol 10%, OTC approved, not new

- **Recurrent Herpetic Infection**
  - **Systemic Agents:**
    - Sitavig (acyclovir) 50 mg buccal tab X 1
    - Zovirax, g (acyclovir) 400 mg capsules
      - Take 1 capsule 3 times a day X 5 days
    - Valtrex, g (valacyclovir) 1 g tablets
      - Take 2 tablets twice daily, 12 hours apart, when symptoms first develop
    - Famvir, g (famciclovir) 500 mg tablets
      - Take 3 tablets as a single dose at first sign of infection (not rec for children)

- **Topical Antiviral Agents for Lips**
  - All approved for use in children > 12 yrs
  - Docosanol (Abreva) cream 10% (OTC)
    - Sig: Apply 5 times/day for up to 10 days
  - Penciclovir cream 1%
    - Sig: Apply q8h while awake for 4 days
  - Acyclovir cream 5%
    - Apply 5 times/day for 5 days
  - Xerese (acyclovir 5%/hydrocortisone 1%) cream
    - Apply 5 times/day for 5 days (new, expensive)

- **HX: 13 YO female who had multiple sealants placed under rubber dam**
  - Suspected cause: Etchant gel, 37% phosphoric acid
Questions to Ask?

- Recurrence rate, duration, location of sores?
- Start as a sore, pimple or a blister?
- Do rashes on the face develop also?
- Do the sores occur inside & outside the mouth?
- Weight loss? Growth rate?
- Any other family member get them?
- Any stomach, joint, bowel, bruising problems?
- Headaches, dizziness, fever, swollen glands?

Angular Cheilitis in Children

- Inflammatory lip lesion
- Cause: *Candida albicans, S. aureus*
- Factors: Drooling & licking lips, oral candidiasis, lip incompetence, chapped lips, vitamin deficiency
- Site: Corners of mouth
- S/S: Erosions, ulcerated fissures, papules; may bleed; tender; recurs
- Complication: Scar, pigment changes

Angular Cheilitis

- Identify and eliminate the cause
- Nystatin ointment 100,000 U/g
- Clotrimazole cream 1% (RX and OTC)
- Miconazole cream, ointment 2% (RX, OTC)
- Ketoconazole cream 2%
- Triamcinolone/Nystatin ointment, cream
- Hydrocortisone/iodoquinol cream 1%
- Impetigo - Bactroban (mupirocin) oint 2%

New Crazes in the Bag

- Heated water pipes with tobacco and other chemicals, including marijuana
- Smoking 200 puffs/hr (1 cig = 20 puffs)
- 15-17% HS students
- Physical adverse effects
- Spread infectious diseases
- Second-hand smoking
Hookah & Soft Tissue Findings

- Lip or palatal burn
- Lip or palatal keratosis
- Nicotinic stomatitis
- Soft palate, uvula: edema and erythema
- Oral dryness, coated tongue
- Superficial mucocoeles
- Prominent leukoedema

Tobacco Products

- 24.6% of HS students use 1+ tobacco products
- Types:
  - Conventional
  - Smokeless, including dissolvable
  - Electronic (21% 12th graders; up 11% from ’17) 2018 Monitoring the Future (MTF) survey
  - Water pipes (Hookah)
  - Cigars, cigarillos

Hot Topic: e-Cigarettes and Adolescents

Unique Complications:
- Exploding devices causing orofacial burns, fractured teeth, jaw
- Chemical toxicity in young children has escalated
- Addictive potential that tastes good
- Cariogenic potential of the aerosols
- Serious lung disease: EVALI

Primary Herpes Simplex Infection

- Cause: HSV-1, HSV-2
- Types: Gingivostomatitis, pharyngitis
- 2 age peaks: 6 mos - 5 yrs; early 20s
- Transmission: Direct contact, saliva, sexual
- Symptomatic disease: 12-30% infected
- Site: Oropharyngeal, anogenital & cutaneous
- Duration: 7 - 14 days
- S/S: Acute onset, fever, lymphadenopathy, malaise, pain, erythema, vesicles, ulcers, drooling, dysphagia; widespread oral lesions

Multifocal Ulcers of Sudden Onset

- Widespread distribution of acute onset
- Painful, dysphagia
- Duration is usually <2 wk
- Vesicles —> ulcers
- Oral +/- skin lesions
- Systemic features
- Cause is often viral
- Most are common diseases

Primary HSV Infection

- Note large palatal ulcer

Medscape Medical News © 2019
FDA Threatens to Remove e-Cigarettes From Market as Teen Use Surges
**Primary HSV Infection**
- HSV Pharyngitis

**Mimics:**
- Infectious mononucleosis
- Herpangina
- Gonococcal pharyngitis

**Primary HSV Infection**
- When to Treat?
  - Cochrane Review: Weak positive evidence
  - Early infections - the first 3 days
  - Severe cases with extensive skin lesions
  - Cases with peri-orbital or ocular lesions
  - Immunosuppressive drugs, steroids
  - Children who are immunocompromised
  - Multiple siblings who are close in age?
  - Caution with renal disease, dehydration

**Primary HSV Infection**
- Topical Coating Agents:
  - Benadryl/Maalox susp +/- lidocaine viscous 2%
  - Sucrets (dyclonine) throat lozenges (older child)

**Primary HSV Infection**
- Systemic Agents:
  - Zovirax, g (acyclovir) 200mg/5mL, caps 400mg
  - Valtrex, g (valacyclovir) tabs 1g

**Primary HSV Infection**
- Nutritional Liquid Supplements and Fluids

**Primary HSV Infection**
- Topical Antimicrobial Agent for 2˚ Infection:
  - Chlorhexidine rinse .12% (after ulcers resolved)

**What Else Is In The Bag?**
- Primary herpetic gingivostomatitis
- Herpangina & Roseola infantum
- Hand, foot, and mouth disease
- Varicella and herpes zoster
- Herpetiform aphthae
- Erythema multiforme
- Necrotizing ulcerative gingivitis
- Streptococcal or Staphylococcal stomatitis
- Infectious mononucleosis (EBV)
- Gonorrheal stomatitis

**Enterovirus Infection**

**Herpangina**
- Common, acute infection
- Virus: CA, CB, EV71
- Age: Most <6 yr
- S/S: +/- Fever, sore throat, dysphagia
- Oral: Vesicles, ulcers on soft palate, tonsillar pillar
- Adverse: Encephalitis, carditis, pneumonitis, paralysis
- May recur – different virus

**Enterovirus Infection**

**Hand-Foot-Mouth**
- Common, acute infection
- Virus: CA, EV71
- Age: Most <6 yr
- S/S: +/- Fever, sore throat, dysphagia, hands, feet, buttock, other skin
- Oral: Vesicles, ulcers on tongue, buccal, labial mucosa
- Adverse: Same
- May recur – 4% in 36 mo
Hand-Foot-Mouth Disease

4 YOWM with mouth sores of sudden onset, no fever, no skin lesions
Oral lesions tend to more anterior and multifocal distribution
Potential complication: Acute flaccid myelitis

Hand-Foot-Mouth Disease

CC: 8 YOWF with sore mouth; no skin lesions
Mimics:

- Herpetiform aphthous ulcers
- Erythema multiforme

New Findings in the Bag

Acute Flaccid Myelitis

- Emerging polio-like disease of childhood
- Etiology: ?, CV-A16, EV-A71, EV-D68
- Season: Late summer, early fall (Aug-Oct)
- Mean age: 6y (<1-15y); 90% in children
- Gender/Race: White males
- Precedes viral syndrome; mild URI
- DX: Acute weakness of 1+ limbs, MRI spinal cord lesion, CSF pleocytosis
- Sites: Extremities, face, neck, eyes (bulbar), pharynx, larynx
- Elrick et al. JAMA Pediatr Nov 30, 2018; www.CDC.gov

Signs/Symptom: AFM

- Sudden onset of arm, leg weakness, loss of muscle tone, reflexes
- Facial droop, weakness
- Difficulty moving eyes
- Drooping eyelids
- Difficulty swallowing
- Slurred speech
- Complication: Respiratory failure, meningoencephalitis, death
- TX: ? Steroids, IVIG, PLEX (CDC.gov)

White Lesions in Children

- White Surface Thickening
- White Surface Material

http://mobilephysiotherapyclinic.in/facial-palsy-physiotherapy-treatment/
**Frictional Keratosis**
- Common reactive lesion
- Chronic low-grade trauma
- Causes: Biting or sucking habits, orthodontic appliance, fractured tooth, toothbrush
- Site: Buccal mucosa, lateral tongue, gingiva
- S/S: Focal, white, adherent, rough patch; nontender
- TX & Prog: Eliminate cause, lesion regresses

**Cheek-biting Keratosis with Ulcers**
- Chronic habit
- Increased anxiety – may be associated with OCD in severe cases
- May be factitial
- Additional trauma with local anesthetic or orthodontic appliances

**New Condition in the Bag**

**Aggressive Lip and Cheek Biting**
- **Body Focused Repetitive Behavior**
  - Any repetitive self-directed behavior that damages the skin, hair, or nails.
  - Coping mechanism for uncomfortable or anxious situations
- Common habits
  - hair-pulling
  - skin-picking
  - nail-biting
- Starts: 11-14 YO
- ↑ risk, if close relative has behavior
- May indicate use of illicit drugs
- Tx: Behavioral therapy, anti-depressants, anti-obsessive drugs

**What Else Is In The Bag?**
- Hairy leukoplakia
- Lichen planus
- Cinnamon reaction
- Frictional keratosis
- Leukoedema
- Linea alba
- Cheek biting keratosis
- Smokeless tobacco keratosis
- Leukoplakia

**Cinnamon Contact Stomatitis**
- Common allergy from cinnamon oil, but other flavoring agents may be culprit
- Sources: Ice cream, soft drinks, gum, candy, toothpaste, breath freshener, mouthwashes, dental floss
- Site: Gingiva, lips, buccal mucosa, tongue
- S/S: White shaggy patches with erythema; chapped lips; red, swollen gingiva; burning sensation
- TX: DC product – resolve in 1 week; topical steroids, if severe
Contact Cinnamon Stomatitis

Toothpaste Allergens
- Flavors, unspecified
- Cocamidopropyl betaine
- Sodium lauryl sulfate
- Propylene glycol
- Essential oils
- Parabens
- Peppermint, Spearmint
- Vitamin E
- Grape extract
- Propolis
- Tea tree oil

New Crazes in the Bag
- Most do not have fluoride
- Bentonite clay (38%) – some are carcinogens
- Betel leaf (1%) – carcinogen
- Charcoal is an abrasive

White Surface Material Lesions
- Creamy to filmy white
- Soft surface debris
- Semiadherent or nonadherent
- Raw, red base
- Plaque or papular pattern
- No surface enlargement
- Usually symptomatic

Chemical Burn

Mucosal Sloughing
- Cause: Sensitivity to dental or OH products; pH
- Factors: ↓ saliva or ↑ viscosity; mouth-breathing
- S/S: Irregular, white semi-adherent patch; rough and mildly tender
- Resolves within 24 hrs
- Mimics: Frictional keratosis, mucosal burn, candidiasis

Cause: bonding etchant
Mucosal Sloughing
- Mucosal sloughing
- Superficial mucoceles

What Else Is In The Bag?
- Pseudomembranous candidiasis (Thrush)
- Mucosal sloughing
- Chemical burn
- Lip, cheek biting lesion
- White coated tongue
- Plaque (biofilm)
- Ulcer with necrosis
- Koplik’s spots (measles)
- Mucous patch

Chemical & Thermal Burns
- Causes: Aspirin, phenol, phosphoric acid, heat, chemicals, including topical anesthetics
- Site: Any mucosal site
- S/S: Localized or diffuse, tender white patches that wipes off, leaving a raw, red base
- Tx: Sodium bicarbonate rinse, OTC coating agents

Mucosal Burn Masking HSV
- Following painful gingiva, adolescent rinsed repeatedly with OTC mouthrinse for 7 days
- Note Fordyce granules, mucosal pseudomembrane, erosions and ulcers

Mucous Patch
- Associated with secondary syphilis
- Treponema pallidum → oral sex, deep kissing
- Develops 4-10 wks after initial infection (chancre)
- General S/S: Painless lymphadenopathy, sore throat, malaise, headache, fever, painless rash
- Oral site: Tongue, lip, buccal mucosa, palate
- Oral S/S: Multiple, tender white patches, oval to serpentine, 30% develop these lesions
- Resolve 3-12 weeks; may recur within the year
- TX: Pen G (IM), doxycycline, if allergic

Mucous Patch
- Evaluate for lymphadenopathy and skin rash
- Ask if sexually active, including oral sex
Soft Tissue Enlargements
- Papillary Surface Enlargements
- Acute Inflammatory Enlargements
- Reactive Hyperplasias
- Benign Submucosal Cysts & Neoplasms
- Aggressive & Malignant Neoplasms

Squamous Papilloma
- Type: HPV 6, 11
- Sexual, nonsexual transmission
- Incubation: 3 wk – 2 yr
- Comprise 8% of all oral growths in children
- Site: Palate, tongue, lips
- S/S: Solitary, pink, red, or white papillary nodule
- Tx: Excise; no malignant potential

Squamous Papilloma
- Type: HPV 6, 11
- Sexual, nonsexual transmission
- Incubation: 3 wk – 2 yr
- Comprise 8% of all oral growths in children
- Site: Palate, tongue, lips
- S/S: Solitary, pink, red, or white papillary nodule
- Tx: Excise; no malignant potential

Verruca Vulgaris
- Cause: HPV 2, 4
- Prevalence: 10-50% of children
- Site: Hands, face are common
- Oral Site: Lip, labial mucosa, anterior tongue
- S/S: Nodule with fingerlike projections or rough, pebbly; pink, brown or white; painless
- TX: Remission – 20% in 6 mos; 65% in 2 yr; excise, laser, cryotherapy, cimetidine, salicylic acid (first line on skin), duct tape, imiquimod, retinoic acid, others

Verruca Vulgaris
- Cause: HPV 2, 4
- Prevalence: 10-50% of children
- Site: Hands, face are common
- Oral Site: Lip, labial mucosa, anterior tongue
- S/S: Nodule with fingerlike projections or rough, pebbly; pink, brown or white; painless
- TX: Remission – 20% in 6 mos; 65% in 2 yr; excise, laser, cryotherapy, cimetidine, salicylic acid (first line on skin), duct tape, imiquimod, retinoic acid, others

Pigmented Labial Warts
- Cluster of brown labial warts
- Increasing in size, spreading
- Tx: Tretinoin cream 0.05% X 15 wk

What Else Is In The Bag?
- Verruca vulgaris
- Squamous papilloma
- Condyloma acuminatum
- Multifocal epithelial hyperplasia
- Giant cell fibroma
- Localized juvenile spongiform gingival hyperplasia
- Inflammatory papillary hyperplasia
- Molluscum contagiosum
Condyloma Acuminatum

- **Cause:** HPV 6, 11 (90%), 16, 18 and others
- **Occurs in 1% of sexually active individuals**
- **Incubation period:** 1 to 3 months
- **Site:** Anogenital and oral mucosa
- **Oral Site:** Labial mucosa, palate, ventral tongue
- **S/S:** Pink nodules with short, blunted projections; painless; usually multiple
- **TX:** Excision, laser, imiquimod cream, other
- **Prognosis:** Recurs, malignant potential (anogenital)

Condyloma Acuminatum

- In children may indicate:
  - Vertical transmission
  - Direct contact
  - Sexual abuse
  - Sexual activity

Condyloma Acuminatum

- **Newborns:** 6.5% (1.5%-47%) (in review LaCour D, 2012)
- **Pediatric prevalence:** 2%
- **Adolescents:** 2.5% for HPV 16/18 (Flake C, et al 2012)
- **Female adolescents (14-19y):** 35% HPV positive overall (in review LaCour D, 2012)

New Recommendation In The Bag

- **HPV Vaccine**
  - Gardasil© 9 (Merck): Prevents cervical, vulvar, vaginal and anal cancers and anogenital warts
  - Protects: HPV 6,11,16,18, 31, 33, 45, 52, 58
  - Recommended for ♀ and ♂ ages 9-26y
  - FDA approved for adults – 27-45y
  - 50% of new HPV infections occur in 15-24 YO
  - Protective role in 92% of HPV-associated cancers
  - Oral HPV: 11.5% of ♂ and 3.2% of ♀ (14 M)
More HPV Vaccine News

- Children aged 9-14y can be vaccinated on 2-dose schedule
- 3 doses, if 15y + or if immunocompromised
- Long-lasting protection after 2-doses (Meltes E, et al, MMWR 2016)
- Effectiveness: 97-100% effective when HPV naive:
  - Herd protection – 34% for unvaccinated
  - Duration of effectiveness: 10 years

Old Lesion With New Name In The Bag

Localized Juvenile Spongiotic Gingival Hyperplasia (LJSGH)

- Distinct, new subtype of gingival hyperplasia
- Other names: Juvenile spongiotic gingivitis or juvenile gingival papillomas
- Origin: Sulcular/junctional epithelium
- Cause: Unknown – not strong biofilm association; cervical enamel irregularities
- Factors: Orthodontics (15%), tooth eruption, lip incompetence, mouth breathing, puberty
- Age/Gender: Ave = 12 YO (range 5-39); F>M

Localized Juvenile Spongiotic Gingival Hyperplasia

Biofilm is not the only factor
May occur in primary dentition

Localized Juvenile Spongiotic Gingival Hyperplasia

Velvety and papillary pattern was tender when brushing
Excisional biopsy – 1 month post-op
Some clinicians claim to have good results with topical steroids, lasers

LJSGH

- Site: Anterior facial gingiva, esp. maxillary (84%); may be multifocal
- S/S: Papillary, red nodule or velvety, granular patch; bleeds easily; nontender
- Minimal response to OH
- TX & Prog: Biopsy; 6-16% recur in 1yr; may resolve
  - Dhing, J et al. ODODD 2006;16:411-8

Photo: Dr. Golnar Jahanmir

Velvety pattern
LSJGH or Not?

12.6 YOWF undergoing orthodontic treatment for 6 weeks
CC: Pink translucent papules of the gingiva in 2 adolescents
HX: Nontender swelling that bleeds with brushing; duration unknown

Mucoceles

- Type: Reactive lesion of salivary glands
- Cause: Trauma to ducts and glands
- Age: Children and young adults
- Site: Lower lip (81%), buccal mucosa (5%), ventral tongue (6%), floor of the mouth (6%)
- S/S: Translucent blue, fluid-filled swelling; fluctuates in size; may be tender
- TX: Excisional biopsy with adjacent glands; 40% spontaneously resolve, recur – 6%
- Variant: Ranula – floor of the mouth

Mucocele

- Pedunculated
- Sessile

Mimics:
- Hemangioma
- Lymphangioma
- Fibroma
- Cystic salivary gland tumor

Small Mucocele

- Mucocele is not directly associated with lip piercing, but possible secondary development due to lip swelling or playing with the oral jewelry

Ranula

- Involves the sublingual gland
- May be translucent pink, blue or red
- Usually not tender, but interferes with eating and speaking
- Do not incise and drain it
- May progress to plunging ranula
Elevated Sublingual Glands
- Anatomical variation
- Bilateral and symmetrical, bloomed with pink smooth surface
- Painless unless traumatized
- Make sure of patent ductal opening
- Rule out other diseases, especially if unilateral
- Tx: None required

Cherry Angioma
- Superficial vascular lesion
- Cause: Trauma in children
- Gender/Age: Males > 5y
- Site: Vermilion of lip
- S/S: Red, blue, purple papule; blanches
- TX: Laser, sclerosant or excise; no involution
- Cosmetic concern

Labial Cherry Angioma
- If multiple, rule out syndrome
- Hereditary hemorrhagic telangiectasia

Melanocytic Nevus
- Type: Benign proliferation of nevus cells
- Age/Gender: 15% of oral nevi occur in children; may be congenital (10%); F > M
- Site: Palate, buccal mucosa, gingiva, lip
- S/S: Pink, brown, blue or black macule or nodule; 85% pigmented; 70% elevated
- Most common types: Intramucosal, blue
- TX & Prog: Excisional biopsy; rare malignant transformation

Melanocytic Nevus
- Compound nevus
- Blue nevus

Dysplastic Nevus
- Note the variation in color and irregular margins
Atypical Melanocytic Proliferation

Melanoma occurs in children.

Worrisome features:
- Congenital lesion that increases in size
- Large size
- Very dark color
- Asymmetric margins
- Surface changes
- Overlap features of benign and malignant

What Else Is In The Bag?

- Melanocytic nevus
- Melanotic macule
- Amalgam or lead tattoo
- Drug-induced pigmentation
- Physiologic pigmentation
- Inflammatory melanosis
- Smoker’s melanosis
- Late petechiae, purpura

Minocycline Pigmentation

- Cause: Drug binds to certain types of collagen → pulp, dentin, bone, nails, dermis, sclera
- Purpose: Primarily used to treat acne
- Prevalence: 3-6% of chronic users; 15% - acne
- Develops: 1 month to several years of use
- Site: Ant alveolar mucosa, hard palate, teeth
- S/S: Diffuse blue-gray to muddy brown
- TX: DC med → soft tissue fades; permanent tooth discoloration

Minocycline Pigmentation

Pigmentation of periosteum

Drugs & Oral Pigmentation

- Antibiotic: Minocycline
- Pepto-Bismol, others containing bismuth (extrinsic stain)
- Antimalarial medications: chloroquine, hydroxychloroquine, quinidine
- Antipsychotic drug: chlorpromazine
- Antineoplastic: doxorubicin, busulfan, cyclophosphamide
- Kinase inhibitor: Gleevec (imatinib) for leukemia, soft tissue sarcoma, aggressive fibromatosis

New Recommendation In The Bag
Doxycycline for Young Children

- Teeth staining with use of tetracyclines in young children
- No evidence of teeth staining following multiple short courses of doxycycline
- When doxycycline is treatment of choice for a serious infectious disease, it should be given regardless of age.
- AAP Red Book 2018