Non-neoplastic Parotid Disorders

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Disclosure

Nothing to disclose
Objectives

- Presentation
- Evaluation
- Classification system parotid enlargement
  - Inflammatory
  - Non-Inflammatory

Non-neoplastic Parotid Disorders

- Variety of clinical disorders
  - Primary gland disorder
  - Systemic disorder with gland involvement
- Local symptoms +/- systemic or asymptomatic
- Diagnosis generally dependent on clinical evaluation and diagnostic studies
- Treatment largely guided by diagnosis and patient complaints
History

• Determine which salivary gland or glands are involved
• Progression of enlargement
• Inciting factors for enlargement
• Nature and duration of symptoms
• Pain: character, severity, frequency
**History**

- Associated Symptoms
  - Head and Neck
  - Systemic
- Review of Systems
- Medications
- Past Medical History
- Social History (eg. alcohol use)
- Family History

**Physical Examination**

- Complete Head and Neck Exam
- Inspection / Palpation of Salivary Glands
  - enlargement (unilateral/bilateral)
  - consistency
  - tenderness
  - mobility
- Differentiate diffuse gland enlargement from discrete mass or anatomic anomaly
Physical Examination

• Cranial Nerves
  V, VII, X, XI, XII
• Eyes
  - lacrimal gland enlargement
  - tear adequacy
• Neck lymphadenopathy
  - unilateral or bilateral

Team Approach

• Radiology
• Pathology / Cytopathology
• Internal Medicine
• Rheumatology, Endocrinology
• Infectious Diseases
• Pediatrics
• Psychiatry
• Nutrition
Office-based Ultrasound

Sialogram
CT Scan / MRI

- Useful to rule-out neoplasm or extrinsic mass
- Extent of glandular enlargement
  - localized or diffuse
  - unilateral, bilateral, or generalized
- Nature of enlargement
  - parenchyma density
  - fat, fibrosis
  - presence of cysts

Parotid Gland Imaging - CT Scan

- CT scan may not show parotid masses
- Often does not allow characterization as to benign or malignant
- CT scan preferred for parotid inflammatory processes
  - abscess
  - sialolithiasis
CT Scan – L Parotid Stone

Bilateral Masseter Muscle Hypertrophy
Bilateral Diffuse Parotid Enlargement
Laboratory Studies

• Order selectively based on information gleaned from history, physical examination, and imaging studies
• Useful for diagnosis or exclusion of systemic disorders:
  - Infectious
  - Granulomatous
  - Metabolic
  - Autoimmune
  - Hormonal

Laboratory Studies

• Complete blood count
• Sedimentation rate
• Fasting blood glucose
• Serum electrolytes, calcium
• BUN, creatinine, liver function tests
• Serum triglycerides, albumin
Laboratory Studies

- HIV test
- Angiotensin converting enzyme (Sarcoid)
- Autoantibodies (Sjogren’s)
  - Rheumatoid factor
  - Antinuclear antibodies
  - Anti-SSA, Anti-SSB
- Antineutrophil cytoplasmic antibody (ANCA) (Wegener’s)
- Hormone levels (eg. TSH)

Fine Needle Aspiration Biopsy

- Valuable to exclude neoplasm or lymphoma
- Accurate for diagnosis of non-neoplastic enlargement
- Acinar size measurement may be helpful (sialadenosis)
- Clinicopathological correlation important
Diagnostic Salivary Gland Biopsy

- Lower lip minor salivary glands
  - obtain multiple glands
- Sjogren’s - greater than one focus
  (>50 lymphocytes in area) in 4 mm²
- Sarcoid - noncaseating granulomas
- Parotid biopsy more sensitive
Sialendoscopy for Evaluation of Glandular Swelling of Unclear Etiology

Koch M et al; OHNS, 2005

- 103 patients with chronic gland swelling
- Imaging studies (esp. U/S)
- No clear etiology of swelling
- 97% success
- Findings:
  - stones 20%
  - stenosis/ foreign body 56%
  - sialodochitis 10%
  - normal 10%
Diffuse Parotid Gland Enlargement Classification

• Inflammatory Enlargement

• Non-Inflammatory Enlargement

Inflammatory Enlargement

**Acute Sialadenitis**
- Viral
- Bacterial
- Radiation
- Medication

**Chronic Sialadenitis**
- Obstructive
- Granulomatous
- Autoimmune
- HIV-associated
Acute Viral Sialadenitis (Mumps)

- Acute viral infection
  - Paramyxovirus predominates
- Unusual due to two-dose MMR vaccine
- Spread by cough, sneeze; 2-3 wk incubation
- 2006 Midwest outbreak (1st in 20 years)
- Iowa and surrounding states
- Over 2500 cases (usually 265/year)

Acute Viral Sialadenitis (Mumps)

- Bilateral or unilateral painful parotid swelling
- Fever, headache, cough, malaise
- Clinical diagnosis; serologic test
- Symptomatic and supportive treatment
- Usually resolves in several weeks
- Deafness, meningitis, orchitis
**Acute Bacterial Sialadenitis**
- Acute bacterial infection of ducts and parenchyma
- Usually unilateral
- Debilitated and dehydrated patients
- Polymicrobial: 
  - *Staph aureus*, H. flu, gram neg. anaerobes
- Painful diffuse gland enlargement, tenderness
- Antibiotics, hydration, gland massage, oral care
- Surgical drainage for medical therapy failure

**Sialolithiasis**
- Common parotid gland obstructive disorder
- Exact etiology unknown
- Theory: deposition of calcium salts around a nidus of:
  - desquamated cells
  - microorganism
  - foreign body
  - mucous plug
- Reduced fluid intake; medication; smoking

Huoh KC, Eisele DW; OHNS, 2011
Sialolithiasis

- Recurrent painful gland swelling
- Episodes of acute bacterial sialadenitis
- Abscess formation
- Chronic sialadenitis
- Gland atrophy

Left Parotid Stones and Abscess
Endoscopic Management of Parotid Sialoliths

- Removal with forceps or basket
  - small stones (up to 3mm)
- Crush with forceps or laser lithotripsy and remove fragments
- External lithotripsy and remove fragments
- Combined endoscopic and open approach
Parotid Stone
Radiation Sialadenitis

- Inflammatory process due to radiation effect on gland parenchyma, dose-related injury
- Serous glands and acini most susceptible
- External beam radiation
- Radioactive iodine
- Painful, tender glands; swelling; xerostomia
- Chronic injury can result
- Some benefit with sialendoscopy

Sialendoscopy – I\textsuperscript{131} Sialadenitis
Prendes et al; Arch OHNS, 2012

- 11 patients (9 women and 2 men)
- 20 parotid glands treated; Mean f/u = 18 months
- Most patients (91%) reported improvement of symptoms following a single sialendoscopy procedure
- Complete resolution of symptoms with sustained benefit was reported by 6/11 (54%) patients
- Partial improvement in 4/11 (36%) patients
Chronic Sialadenitis

- Non-granulomatous chronic inflammatory condition
- Etiology may be unclear by history
  - primary obstruction / secondary infection
  - primary infection / secondary obstruction
- Recurrent painful gland enlargement common
  - exacerbation with eating
- Relief of duct obstruction, sialogogues, glandular massage, warm heat
- Sialendoscopy medical therapy failure
Parotid Sialendoscopy - Chronic Sialadenitis

Chronic Sialadenitis - Sialendoscopy

• Failure of medical management
• Effective for symptom control and gland preservation
• Duct dilation
  - mechanical with scope
  - hydraulic with saline
• Duct flushing with saline

Gillespie et al: Arch OHNS, 2011
Gillespie et al; Head Neck, 2011
Sarcoidosis

- Systemic granulomatous disease, unclear etiology
- < 1/3 patients - painless salivary gland swelling
- Nontender and multinodular glands; xerostomia
- ACE elevation (50-80%)
- Most patients have pulmonary involvement
- CXR- hilar nodes, adenopathy, parenchymal infiltrates
- Noncaseating granulomas on histopathology
- Treatment supportive; steroids in select patients eg. ocular, neuro, cardiac

Chest Radiograph - Sarcoidosis
Sarcoidosis - Noncaseating Granulomas

- Necrotizing granulomatous inflammation and vasculitis; etiology unknown
- Affects upper and lower respiratory tracts, kidney
- Parotid and submandibular gland involvement (5%) causes persistent gland swelling
- Dx: Antineutrophil cytoplasmic antibody (ANCA)
- Biopsy - histopathological triad: granulomatous inflammation, necrosis, and vasculitis
- Treatment – corticosteroids, cyclophosphamide

Wegener’s Granulomatosis

- Necrotizing granulomatous inflammation and vasculitis; etiology unknown
- Affects upper and lower respiratory tracts, kidney
- Parotid and submandibular gland involvement (5%) causes persistent gland swelling
- Dx: Antineutrophil cytoplasmic antibody (ANCA)
- Biopsy - histopathological triad: granulomatous inflammation, necrosis, and vasculitis
- Treatment – corticosteroids, cyclophosphamide
Sjogren’s Syndrome

- Autoimmune disease; Exocrine gland dysfunction with lymphocytic glandular infiltration
- Xerostomia, keratoconjunctivitis sicca
- Bilateral or unilateral nontender parotid swelling
  - most pts. with primary form; 1/3 secondary
  - intermittent or persistent
- Diagnosis- clinical, autoantibodies, gland biopsy
- Clinical and immunological heterogeneity
- Treatment supportive
- Salivary secretagogues - pilocarpine; cevimeline
R Parotid Lymphoma

Sjogren’s Syndrome - Risk

Ioannidis et al; Arthritis Rheum, 2002

- Probability of lymphoma:
  2.6% at 5 years
  3.9% at 10 years

- Independently predicted by:
  parotid enlargement
  palpable purpura
  low C4 level
HIV-Associated Cystic Sialadenitis

- Bilateral parotid multicystic enlargement
- Lymphocytic (T cell) infiltration of gland
- Persistent, nonprogressive; may be mildly painful
- Enlarged adenoids, cervical nodes common
- Diagnosis largely clinical
- Positive HIV test
- Must exclude lymphoma or other neoplasm
HIV-Associated Cystic Sialadenitis - Management

- Anti-retroviral medications

- Injection sclerotherapy
  doxycycline Lustig et al; Laryngoscope, 1998
  sodium morrhuate Berg, Moore; Laryngoscope, 2009
  bleomycin Monama; Laryngoscope, 2010

- Surgery not recommended, despite patient enthusiasm
## Non-Inflammatory Enlargement

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<th>Acute Enlargement</th>
<th>Chronic Enlargement</th>
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### Sialadenosis (Sialosis)

- Non-inflammatory, non-neoplastic gland parenchyma enlargement
- Bilateral parotid enlargement most common
- Can be recurrent or persistent
- Wide variety of systemic conditions causative
- Unifying factor - neuropathic alteration of the autonomic innervation of salivary acini (Batsakis)
- Diagnosis primarily clinical, exclusion of others
- Complete metabolic and endocrine evaluation
Sialadenosis - Etiologies

- **Endocrine Disorders**
  - Diabetes Mellitus (1/4)
  - Hypothyroidism

- **Alcoholism** (autonomic neuropathy)

- **Nutritional Disorders**
  - Bulimia (1/3)
  - Deficiency condition
    eg. protein (alcoholism)
    vitamin (niacin, thiamine, vit. A)

Diabetes Mellitus
Sialadenosis - Etiologies

- **Medications**
  - Direct effect on gland
    eg. iodine compounds
  - Drug side-effect (adrenergic, cholinergic)
    eg. antihypertensives (guanethidine)
    antiemetics (phenothiazine)
    antiepileptics (phenobarbital)
    bronchodilators (isoproterenol)
- **Idiopathic** - diagnosis of exclusion

Sialadenosis - Treatment

- Correct underlying disorder

- **Pilocarpine** - Bulimia
  Mehler, Wallace; Arch OHNS, 1993
  Park et al; J Drugs Dermatol, 2009

- **Parotidectomy** - consider for unacceptable cosmetic deformity unresponsive to medical therapy
Amyloidosis

- Gland infiltration of amyloid
- Acellular, eosinophilic, hyaline material
- Systemic or localized
- Diagnosis by pathological examination
  - congo red stain, polarized light: green birefringence
- No effective therapy
- Excision of localized tumors

Algorithm Approach to Bilateral Parotid Enlargement
Diffuse Salivary Gland Enlargement - Surgical Indications

• Exclude neoplasm
• Confirm or characterize lymphoma
• Chronic sialadenitis refractory to medical management
• Diagnosis of diffuse enlargement when other studies nondiagnostic
• Cosmetic concerns of the patient provided benefits carefully weighed against risks

Summary

• Non-neoplastic parotid gland enlargement caused by a wide variety of clinical disorders
• Primary salivary gland condition or related to a systemic disorder
• Clinical evaluation, imaging studies, laboratory studies, and pathological evaluation for diagnosis
• Management dependent on diagnosis and guided by patient complaints
• Usually involves correction of underlying disorder
• Surgery used selectively