1) Salivary Glands Disorders - Dr. Sirwan Abdullah

Anatomical Considerations

- Two submandibular
- Two Parotid
- Two sublingual
- > 400 minor salivary glands

Minor salivary glands

- These lie just under mucosa.
- Distributed over lips, cheeks, palate, floor of mouth & retro-molar area.
- Also appear in upper aerodigestive tract
- Contribute 10% of total salivary volume.

Sublingual Salivary glands

- Smallest of the major salivary glands.
- Almond shape
- Deep to the floor of mouth mucosa.
- It is drained by approximately
- 10 small ducts (Ducts of Rivinus)

Submandibular Gland

- Wharton’s duct: lateral to the lingual frenulum
- The gland forms a ‘C’ around the anterior margin of the Mylohyoid muscle; a superficial and deep lobe.

Parotid Gland

- Largest salivary gland
- FASCIAL NERVE divides it into 2 surgical zones (the superficial and deep lobes).

Stensen’s duct

- 1.5 cm inferior to the Zygomatic arch.
- Superficial to the masseter muscle,
- Then turns medially 90 degrees to pierce the Buccinator muscle at the level of the second maxillary molar where it opens into the oral cavity.

Functions

- 1500 ml of saliva / day;
- From the parotid gland: thin, watery fluid,
- Sublingual and Submandibular glands: much thicker
- It facilitates swallowing
- It keeps the mouth moist & aids speech
- It serves as a solvent for molecules which stimulate the taste buds
- It cleans the mouth, gum, & teeth.
- It contains enzymes
Diagnostic Approaches

1) Evaluation of dry mouth
2) Past & present medical history
3) Clinical examination
4) Saliva collection
5) Salivary gland imaging
6) Salivary gland biopsy & FNA
7) Serologic evaluation

Clinical History

- History of swellings / change over time?
- Trismus?
- Pain?
- Variation with meals?
- Bilateral?
- Dry mouth? Dry eyes?
- Recent exposure to sick contacts (mumps)?
- Radiation history?
- Current medications?

Clinical examination

- Extra-Oral examination:
  - Palpate cervical lymph nodes
  - Palpate the gland
    - Slightly rubbery
    - Painless unless infected/inflammed
  - Check motor function of facial nerve
1) Plain-film radiography
2) Sialography
3) Ultrasonography
4) Radionuclide imaging
5) Computed tomography (CT)
6) Magnetic resonance (MRI)

Specific diseases & disorders

1) Developmental abnormalities
2) Mucoceles & Ranula
3) Inflammatory & Reactive lesions
4) Sialolithiasis
5) Immune conditions
6) Granulomatous conditions
7) Salivary gland tumours
Developmental abnormalities

1. Absence of salivary gland
   - Rare
   - Associated with other developmental defects
2. Accessory salivary duct
3. Diverticuli (pouch in the duct wall)

Sialadenitis - Acute infection

- *Bacterial*: Acute, Chronic, Recurrent parotitis
- *Viral*: Mumps, Cytomegalovirus
- Allergic sialadenitis
- Post-irradiation
- Sarcoidosis
- Sialadenitis of minor glands

Bacterial sialadenitis

- Susceptible individuals:
  - Gland hypo-function
  - Age extremes
  - Poor oral hygiene
- Parotid gland most commonly affected

Clinical picture

- Sudden onset
- Gland is painful
- Indurated
- Erythematous overlying skin
- It raises the lobule of the ear
- Temp: above 37.8°C.

Lab Testing

- Parotitis; a clinical diagnosis
- Elevated WBC
- MRI, CT or ultrasound
- Needle aspiration of abscess
- Pus expressed from the duct for C & S.

Treatment

- IV antibiotic
- Milk the gland several times a day
- Increase hydration
- Improve oral hygiene
Acute suppurative sialadenitis

- It is an ascending infection
  - Staph. aureus & strept. Viridans
  - From the oral cavity
  - By a reduction in salivary flow
- Following major surgical operations;
  - Due to dehydration
  - Poor oral hygiene
- Brawny swelling on the side of the face
- Advanced cases: skin dusky red.
- Purulent discharge from orifice
- Fluctuation: pus penetrated the parotid sheath.

Acute viral infection

- Mumps parotitis: by the paramyxovirus
- Broad range of viral pathogens
- SYSTEMIC from the onset

Physical examination

- Headache, myalgia, anorexia, malaise, fever
- Glandular swelling (tense, firm)
- Earache, gland pain, dysphagia and trismus
- May displace ipsilateral pinna
- 75% cases involve bilateral parotids

Diagnostic Evaluation

- Leukocytopenia + relative lymphocytosis
- Increased serum amylase
- Viral serology: antibodies

Treatment

- Supportive
- Fluid
- Anti-inflammatory & analgesics

Complications

- Orchitis, testicular atrophy and sterility 20% of young men
- Meningitis in 10%
- Oophoritis in 5%
- Pancreatitis in 5%
- Hearing loss <5%
  - Usually permanent
  - 80% unilateral
**Allergic sialadenitis**

- Caused by drugs or allergens
- Clinical presentation:
  - Acute salivary gland enlargement
  - Itching over the gland
  - With/without rash
- Treatment:
  - Self-limited disease
  - Supportive therapy
  - Avoid allergen
  - Hydration

**Sialolithiasis (salivary stones)**

- One or more round or oval calcified structures in the duct of the major or minor salivary glands
- Submandibular Most common
- Pain subsides before swelling.
- Recurrent painful swelling at mealtime
- Acute & subacute infection
- Persistent obstruction damages the gland making it harder and tender
- Skin is red, oedematous, hot and tender if infected
- Bimanual palpation

**Sialography**

- Demonstrate the lumen of the ducts for stone, tumor, or stricture.

**Treatment**

- Excision:
  - Lithotripsy
  - Sialendoscopy
  - Manipulation fails then a surgical cut is made into duct
- Gland excision
  - The stone is within the gland
  - The gland is severely damaged by chronic infection.

**Granulomatous conditions**

1. **Tuberculosis:**
   - Xerostomia
   - Salivary enlargement
2. **Sarcoidosis:**
   - Severity and duration of disease varies
   - Mild improvement noticed with steroid therapy
Sjogren Syndrome

• Autoimmune condition causing progressive degeneration of salivary and lacrimal glands
• Connective tissue disorder, such as rheumatoid arthritis

Clinical picture

• Mostly affects the parotid gland
• Persistent / intermittent gland enlargem.
• Bilateral, non-tender, firm, and diffuse swelling
• ↓ saliva and altered saliva composition xerostomia
• Significantly increased risk of developing
• B-cell lymphoma
• Keratoconjunctivitis sicca

Diagnosis:

• Biopsy of salivary gland: lower lip

Treatment:

• Treat recurrent infection
• Salivary substitutes/sprays
• Cholinergic drugs (Pilocarpine)
• Avoid alcohol, tobacco
• Immunosuppressive; corticosteroids or cytotoxic

Salivary Gland Tumors

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<tr>
<th></th>
<th>Frequency (%)</th>
<th>Malignant (%)</th>
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<tbody>
<tr>
<td>Parotid glands</td>
<td>65</td>
<td>25</td>
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<tr>
<td>Submandibular gl.</td>
<td>10</td>
<td>40</td>
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<tr>
<td>Sublingual gl.</td>
<td>&lt; 1</td>
<td>90</td>
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<tr>
<td>Minor Salivary gl.</td>
<td>25</td>
<td>50</td>
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Disorders of minor salivary Glands

• Malignancy
• Extravasation Cysts
  o Follow trauma
  o Mainly MSG lower lip
  o Visible painful swelling
  o Some resolve spont. or require surgery

Disorders of sublingual Glands

• Are very rare
• Minor mucous retention cysts
• Plunging ranula is a retention cyst that tunnels deep
• Nearly all tumours are malignant
• Tumours are rare
• 90% are malignant
• Wide excision and neck dissection
Tumors of Submandibular Glands

- Uncommon
- Slowly growing, painless
- 10% malignant

Investigations

- CT/MRI
- FNAC
- No open biopsy

Management

- Small & encased within capsule: intracapsular excision
- Large benign: excision
- Malignant tumours: require concomitant neck dissection

Parotid Tumours

- Most common is pleomorphic adenoma (80-90%)
- Low grade Tumors are not distinguishable from benign tumours
- High grade Tumours grow rapidly, are often painful and have LN metastasis
- CT/MRI are useful
- FNAC better than open biopsy
- Tx should be excised

Pleomorphic adenoma

- Benign Tumor
- The most common salivary T.
- In middle aged & more in woman than in men,
- Slowly growing
- Treatment: Superficial parotidectomy.

Carcinomas

- Hard, rapidly growing infiltrating mass with Fixation
- resorption of bone & ulcer.
- Pain, anesthesia
- muscle spasm
- later paralysis

Diagnosis:

- FNA cytology
- CT scan.

Treatment

- Radical excision
- lymph node dissection & radiotherapy

Table I

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<thead>
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<th>Intra-operative complications</th>
<th>Post-operative complications</th>
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<td>Transection of facial nerve</td>
<td>Early facial nerve paralysis</td>
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<td>Facial sinkinesis after facial paralysis</td>
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<tr>
<td>Rupture of capsule of parotid tumour</td>
<td>Haemorrhage or haematoma</td>
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<td>Hypoesthesia of greater auricular nerve</td>
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<td>Incomplete surgical resection of parotid tumour</td>
<td>Infection</td>
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<td>Recurrent tumour</td>
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<td>Skin flap necrosis</td>
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<td>Soft tissue deficit</td>
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<td>Hypertrophic scar or keloid</td>
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<td>Trismus</td>
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<td>Frey’s syndrome</td>
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<td>Parotid fistula</td>
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