BDS Year 4 Regular batch
Academic Year 2023-2024
Subject: Oral Medicine & Radiology
Topic: SALIVARY GLAND DISORDERS - Part : II

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Infectious conditions

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MUMPS (EPIDEMIC PAROTITIS)

- ribonucleic acid – paramyxovirus: direct contact with salivary droplets.
- Typical patient is 4 to 6 year old.
- Incubation period is 2 to 3 weeks - salivary gland inflammation and enlargement, preauricular pain, fever, malaise, headache, and myalgia
- Parotid glands – sudden enlargement , gland is tender on palpation and lasts approximately 7 days
- The salivary gland ducts are inflamed but without purulent discharge.
- antibodies to the mumps S and V antigens and to the hemagglutination antigen.
- Serum amylase levels may be elevated.

- Complications - mild meningitis and encephalitis. Deafness, myocarditis, thyroiditis, pancreatitis, and oophoritis occur less frequently.
- Males can experience epididymitis and orchitis, resulting in testicular atrophy and infertility if the disease occurs in adolescence or later.
- An attenuated live vaccine is available and is indicated for immunization against mumps in children aged 12 months or older.
- The CDC currently recommends an initial vaccination at 12 to 18 months of age and a second dose at 4 to 6 years of age.

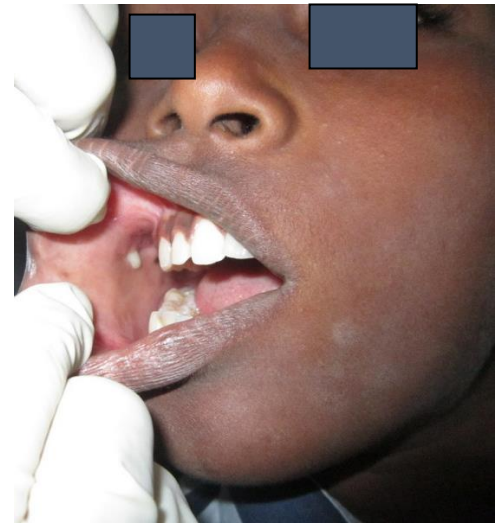
- CYTOMEGALOVIRUS INFECTION
- HIV INFECTION
- HEPATITIS C VIRUS INFECTION

The patient demonstrates the bilateral salivary gland enlargement often associated with HIV.

BACTERIAL SIALADENITIS

- Commonly seen in patients with reduced salivary gland function
- More frequently in the parotid glands.
- Submandibular glands may be protected by the high level of mucin in the saliva, which has potent antimicrobial activity.
- Anatomy may also play a protective role; tongue movements tend to clear the floor of the mouth and protect Warton's duct. In contrast, the orifice of Stenson's duct is located adjacent to the molars, where heavy bacterial colonization occurs.

- sudden onset of unilateral or bilateral salivary gland enlargement.
- The involved gland is painful, indurated, and tender on palpation.
- The overlying skin may be erythematous.
- A purulent discharge may be expressed from the duct orifice
- The most commonly cultured organisms include coagulase-positive Staph. aureus, Strep. viridans, Strep. pneumoniae, E. coli, and H. influenzae.



- Ultrasonography or CT is recommended for visualizing possible cystic areas.
- Treatment-Antibiotic therapy
- Patients is instructed to “milk” the involved gland several times throughout the day. Increased hydration and improved oral hygiene are required.

Evidence

Authors	Otto S et al
Title	**Antibiotic concentrations in saliva: a systematic review of the literature, with clinical implications for the treatment of sialadenitis.** J Oral Maxillofac Surg. 2014 Jan;72(1):67-75. **(Level 1a)**
Aim	The current recommendations for the treatment of bacterial salivary gland infections are mainly empirical.
Results	The review included 18 studies. The systematic analysis of the reported results concurred that intravenously administered cephalosporins achieve the highest concentrations in saliva, followed by orally administered cephalosporins and fluoroquinolones. These concentrations exceed the minimal inhibitory concentrations of the bacteria of interest. Phenoxymethylpenicillin and tetracyclines are not secreted in the saliva at bactericidal levels.
Interpertation	Cephalosporins and fluoroquinolones display superior pharmacokinetics in saliva and cover the spectrum of all bacteria implicated in sialadenitis. Within the limitations of this review, they can be recommended for the treatment of bacterial salivary gland infections.

Medication-Induced Salivary Dysfunction

- Drugs that result in salivary dysfunction include anticholinergics, antidepressants (particularly tricyclics), antihypertensives and antihistaminics.
- Medication-induced salivary hypofunction usually affects the unstimulated output, leaving stimulated function intact.
- When the causative drug is withdrawn, function returns to normal.

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BENIGN LYMPHOEPITHELIAL LESION (MIKULICZ'S DISEASE)

- Etiology-autoimmune; viral or genetic factors are the trigger
- Patients present with unilateral or bilateral salivary gland swelling due to a benign lymphoid infiltration. Reduced salivary flow makes these patients susceptible to salivary gland infections.
- The differential diagnosis includes Sjogren's syndrome, lymphoma, sarcoidosis, and other diseases associated with salivary gland enlargement.
- Diagnosis is based on findings of salivary gland biopsy and the absence of the abnormalities in peripheral blood counts and autoimmune serologies seen in Sjogren's syndrome.
- Treatment is palliative.

SJOGREN'S SYNDROME

- SS is a chronic autoimmune disease characterized by symptoms of oral and ocular dryness and lymphocytic infiltration and destruction of the exocrine glands.
- The etiology of SS is unknown, and there is no cure.
- The salivary and lacrimal glands are primarily affected, but other exocrine tissues, including the thyroid, gland in the lungs and kidney, may also be involved.
- SS patients also frequently experience arthralgias, myalgias, peripheral neuropathies, and rashes.
- Autoimmune-associated anemia, hypergammaglobulinemia, and other serologic abnormalities are frequent in this patient population.
- SS primarily affects postmenopausal women and is classified as primary or secondary.

- **Primary SS - includes both lacrimal and salivary gland dysfunctions without other autoimmune conditions.**
- **Patients with secondary SS have salivary and/or lacrimal gland dysfunction in the setting of another connective-tissue disease.**
- **Oral dryness causes difficulty with chewing, swallowing, and speaking without additional fluids.**
- **Dry cracked lips and angular cheilitis, Mucocutaneous candidal infections are common in this patient population.**
- **decreased salivary flow results in increased dental caries and erosion of the enamel structure.**

- **Patients with SS can experience chronic salivary gland enlargement.**

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Diagnosis of SS

Revised version of the European criteria proposed by the American-European Consensus Group 2002

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I. Ocular Symptoms (at least one)

Dry eyes >3 months?

Foreign body sensation in the eyes?

Use of artificial tears >3x per day?

II. Oral Symptoms (at least one)

Dry mouth >3 months?

Recurrent or persistently swollen salivary glands?

Need liquids to swallow dry foods?

III. Ocular Signs (at least one)

Schirmer's test, (without anesthesia) ≤5 mm/5 minutes

Positive vital dye staining (van Bijsterveld ≥4)

IV. Histopathology Lip biopsy showing focal lymphocytic sialoadenitis

(focus score ≥1 per 4 mm^2)[2]

V. Oral Signs (at least one)

Unstimulated whole salivary flow (≤1.5 mL in 15 minutes)

Abnormal parotid sialography[3]

Abnormal salivary scintigraphy[4]

VI. Autoantibodies (at least one)

Anti-SSA (Ro) or Anti-SSB (La)

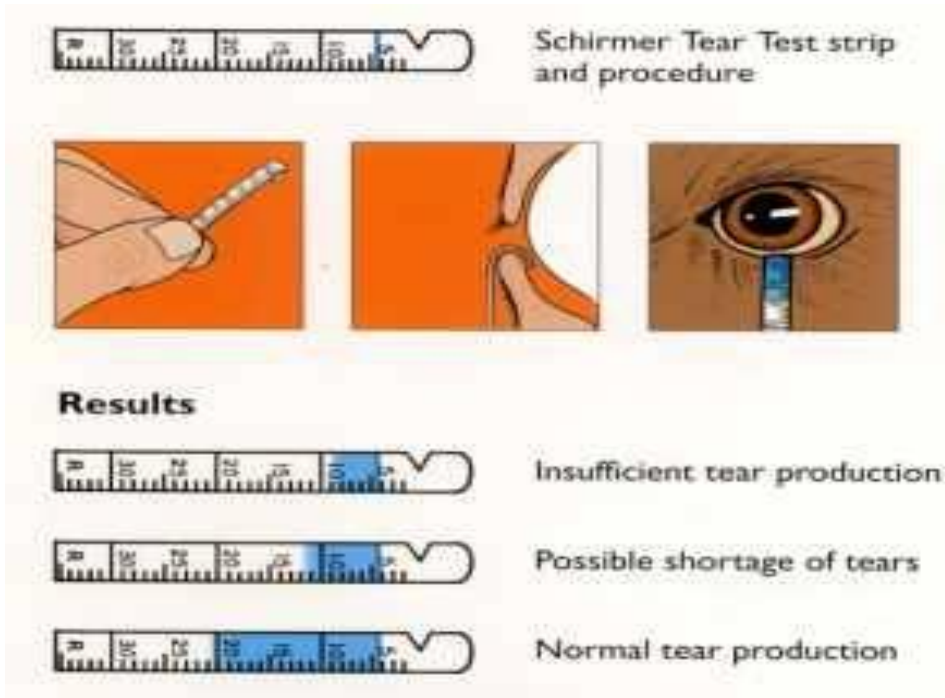
For a primary Sjögren's diagnosis:

a. Any 4 of the 6 criteria, must include either item IV (Histopathology) or VI (Autoantibodies)
b. Any 3 of the 4 objective criteria (III, IV, V, VI)

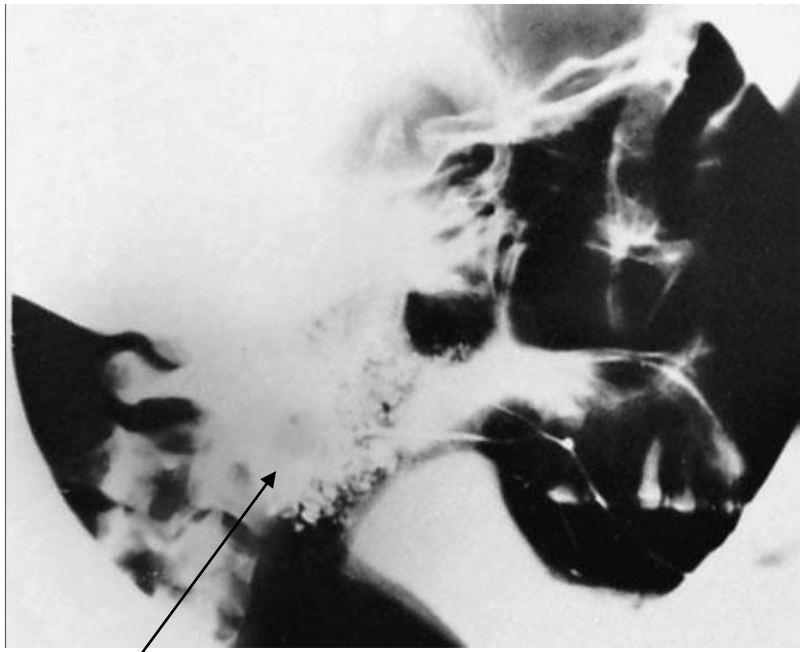
For a secondary Sjögren's diagnosis:

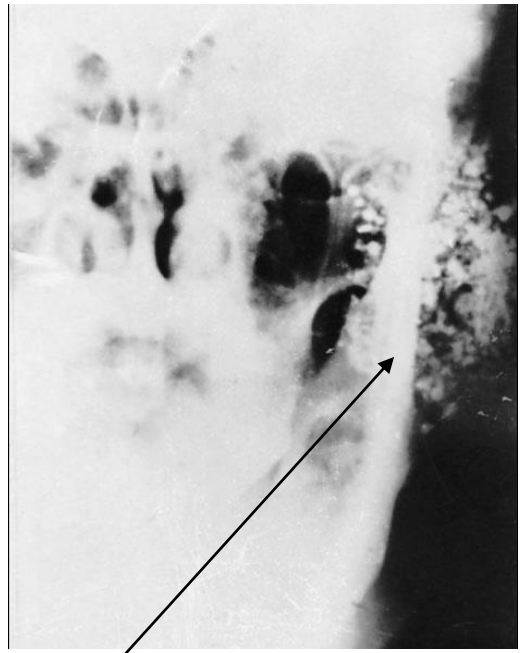
In patients with another well-defined major connective tissue disease, the presence of one symptom (I or II) plus 2 of the 3 objective criteria (III, IV and V) is indicative of secondary SS.

Schirmer`s test

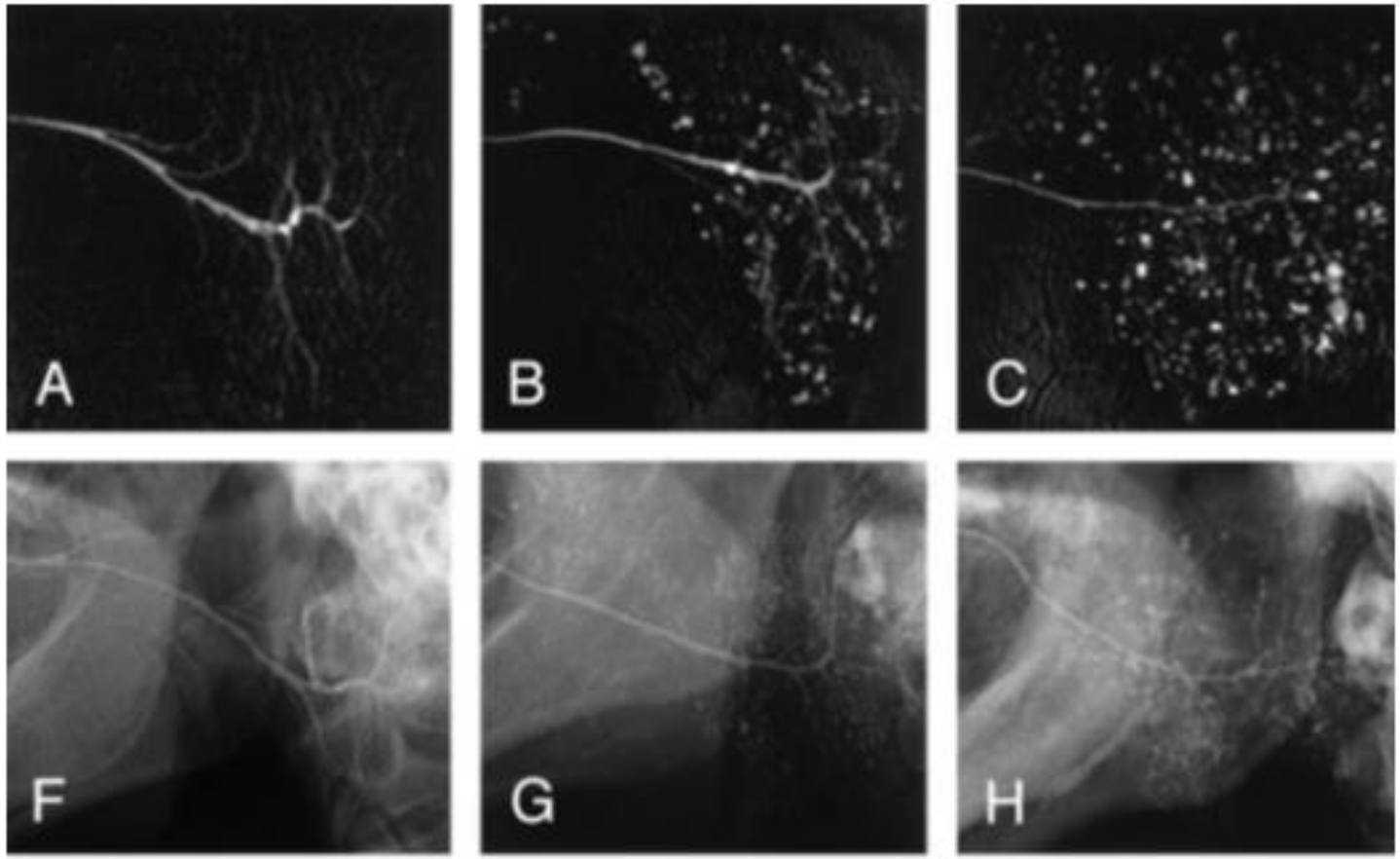


Imaging





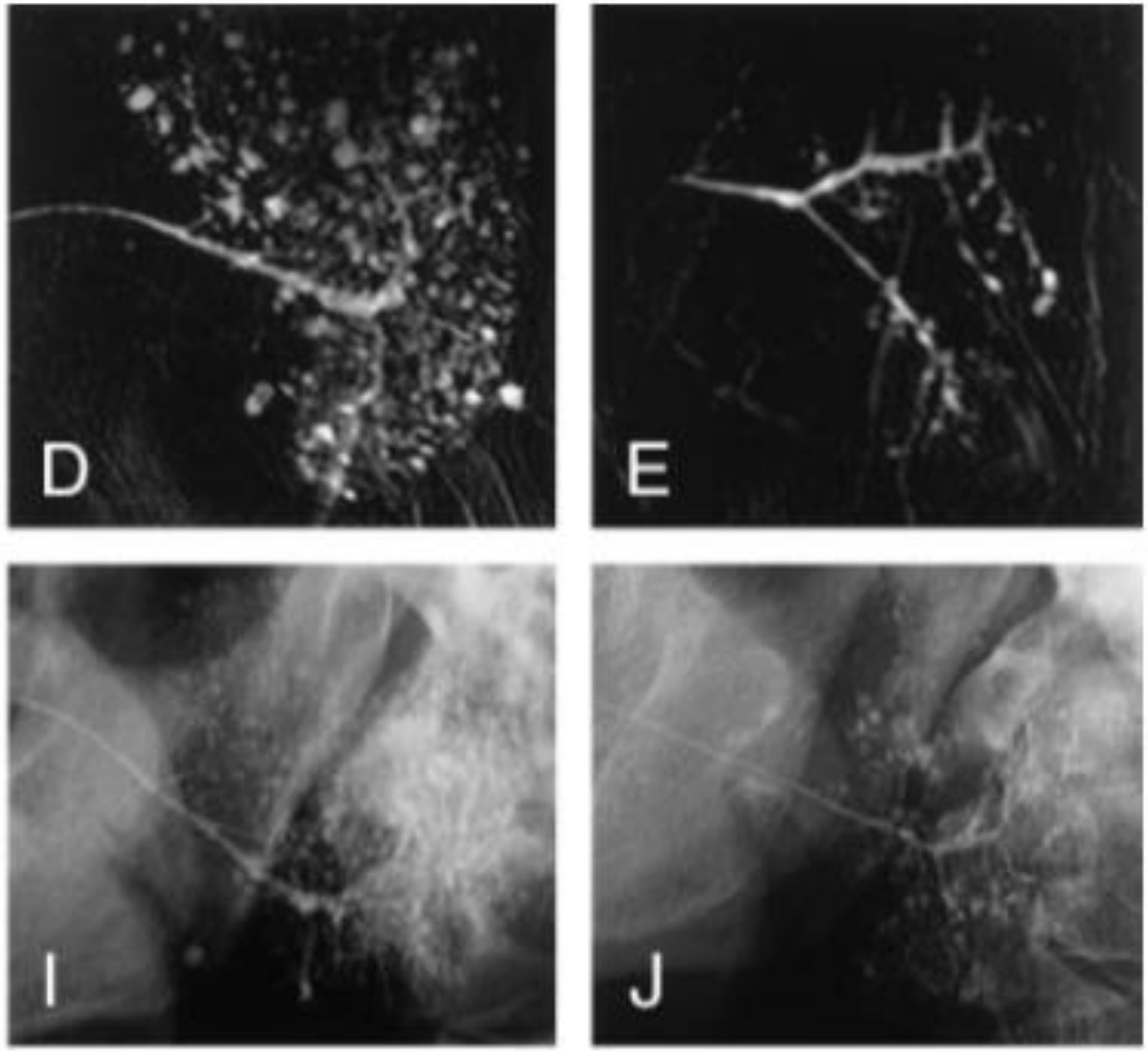
Staging in Sjogren`s syndrome by Tonami and Ohbayashi



Stage 0: Normal

Stage 1: Punctate

Stage 2: Globular



Stage 3: Cavitary

Stage 4: Destructive

- Treatment
- Symptomatic therapies
- Systemic cholinergic medications- pilocarpine and cevimeline.
- interferon-α lozenges as a treatment for the salivary component of SS

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TUBERCULOSIS

- Patients with TB may experience xerostomia and/or salivary gland swelling, with granuloma or cyst formation within the affected glands.

- Multidrug anti-TB chemotherapy

SARCOIDOSIS

- Heerfordt's syndrome(uveoparotid fever) is a form of sarcoid that can occur in the presence or absence of systemic sarcoidosis.

- The syndrome is defined by the triad of inflammation of the uveal tract of the eye, parotid swelling, and facial palsy

TREATMENT OF XEROSTOMIA

- four main categories:

(1) preventive therapy- topical fluorides

(2)symptomatic treatment,

(3) local or topical salivary stimulation,

(4) systemic salivary stimulation.

- **LOCAL OR TOPICAL STIMULATION**
- **Chewing will stimulate salivary flow**
- **Electrical stimulation**

- **SYSTEMIC STIMULATION**
- **bromhexine, pilocarpine hydrochloride (HCl), and cevimeline HCl.**

SIALORRHEA

- “Sialorrhea” refers to excess saliva production. Medications (eg, pilocarpine and cevimeline) can cause increased salivation.
- Patients with neurologic changes may have sialorrhea. This commonly occurs after a cerebral vascular accident or in various neuromuscular diseases (eg, Parkinson’s disease).
- Treatment-mild xerostomia-inducing medication
- injection of botulinum toxin

Medications
- Pilocarpine
- Cevimeline
- Lithium
- Bethanechol
- Physostigmine
- Clozapine
- Risperidone
- Nitrazepam

Neurologic diseases
- Parkinson's disease
- Wilson's disease
- Amyotrophic lateral sclerosis
- Down syndrome
- Fragile X syndrome
- Autism
- Cerebral palsy

Heavy metals
- Iron
- Lead
- Arsenic
- Mercury
- Thallium

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SALIVARY GLAND TUMORS

WHO classification of SG tumors

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- **Adenomas**

1. **Pleomorphic adenoma**
2. **Myoepithelioma**
3. **Basal cell adenoma**
4. **Adenolymphoma, warthin's tumor**
5. **Oncocytic adenoma**
6. **Canalicular adenoma**
7. **Sebaceous adenoma**
8. **Ductal papillomas**
9. **Papillary cyst adenoma**
10. **Mucinous adenoma**

- **Carcinomas**

1. **Acinic cell ca**
2. **Mucoepidermoid ca**
3. **Adenoid cystic ca**
4. **Adenocarcinoma**
5. **Basal cell Adenocarcinoma**
6. **Sabaceous ca**
7. **Papillary cyst Adenocarcinoma**
8. **Mucinous Adenocarcinoma**
9. **Oncocytic ca**
10. **Salivary duct ca**
11. **Malignant myoepithelioma**
12. **Sq.cell.ca**
13. **Undifferentiated ca**

- **Non- Epithelial Tumors**

1. **Lipoma**
2. **Neuroma, neurofibroma**
3. **Hemangioma**
4. **Lymphomas**
5. **Secondary tumors**
6. **Unclassified tumors**
7. **Tumor like lesions**

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TUMORS OF THE SALIVARY GLAND

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- **Benign tumors are more common in the major glands.**

- **Malignant tumors are more common in the minor salivary glands, especially of the palate.**

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Benign Tumors

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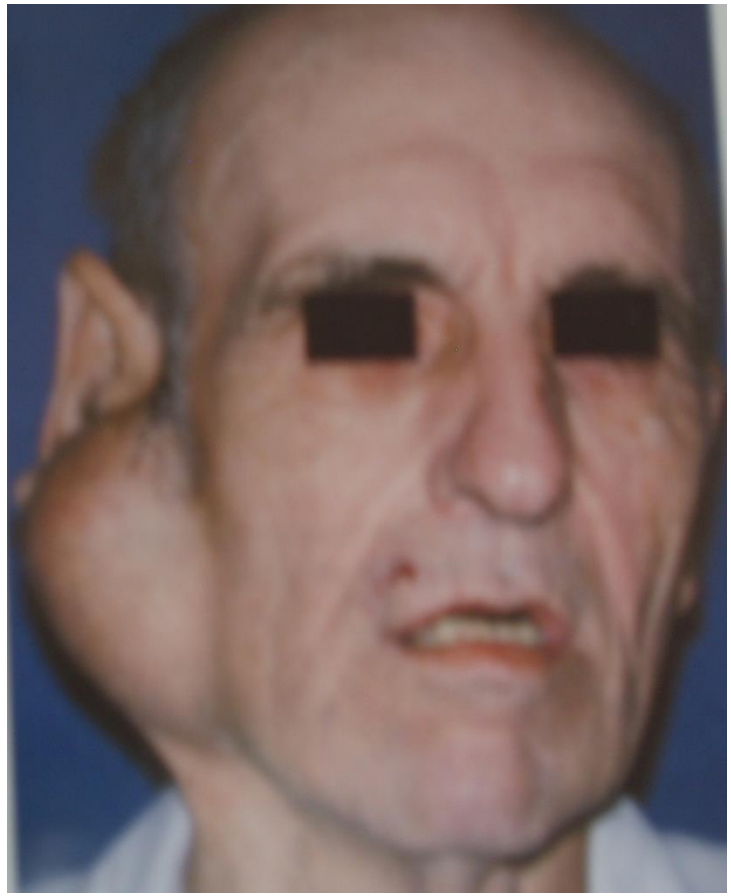
PLEOMORPHIC ADENOMA (mixed tumor)

- most common tumor of the salivary glands
- occur at any age, slight predilection for female and can vary in size
- Tumors will appear as painless, firm, and mobile masses that rarely ulcerate the overlying skin or mucosa.
- In the parotid gland, these neoplasms are slow growing and usually occur in the posterior inferior aspect of the superficial lobe
- Mixed tumors in the submandibular glands present as well-defined palpable masses.



A

B

PAPILLARY CYSTADENOMA LYMPHOMATOSUM (Warthin's tumor)

- second most common benign tumor of the parotid gland, male predilection and seen in fifth and eighth decades.
- well-defined slow growing mass and painless unless it becomes superinfected.

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Malignant Tumors

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MUCOEPIDERMOID CARCINOMA

- Most common malignant tumor of salivary glands.
- Most common malignant tumor of the parotid gland and the second most common malignant tumor of the submandibular gland, after adenoid cystic carcinoma
- Consists of both epidermal and mucous cells. The tumor is classified as of either a high grade or a low grade, depending on the ratio of epidermal cells to mucous cells.
- low-grade tumors undergo a long period of painless enlargement.

- high-grade mucoepidermoid carcinomas often demonstrate rapid growth and a higher likelihood for metastasis.

- Pain and ulceration of overlying tissue are occasionally associated with this tumor. If the facial nerve is involved, the patient may exhibit facial palsy.

- special stains are necessary to differentiate between high-grade mucoepidermoid carcinoma and squamous cell carcinoma.
- superficial parotidectomy, or a total parotidectomy

ADENOID CYSTIC CARCINOMA

- 6% of all salivary gland tumors and are the most common malignant tumors of the submandibular and minor salivary glands.
- presents as a firm unilobular mass in the gland. Occasionally, the tumor is painful, and parotid tumors may cause facial nerve paralysis
- Has a propensity for perineural invasion; thus, tumor tissue often can extend far beyond the obvious tumor margin.
- An intraoral adenoid cystic carcinoma may exhibit mucosal ulceration, a feature that helps distinguish it from a benign mixed tumor.
- Radiographically, the tumor reveals extension into adjacent bone.
- Metastases into the lung are more common than regional lymph node metastasis.

ACINIC CELL CARCINOMA

- 1% of all salivary gland tumors and more in parotid gland
- Common in women and in the fifth decade of life.
- It is the second most common malignant salivary gland tumor in children, second only to mucoepidermoid carcinoma.
- Slow growing mass, Pain may be a associated feature
- Treatment consists of superficial parotidectomy, with facial nerve preservation if possible. When these tumors are found in the submandibular gland, total gland removal is the treatment of choice.

CARCINOMA EX PLEOMORPHIC ADENOMA

- is a malignant tumor that arises within a pre-existing pleomorphic adenoma.
- more often in pleomorphic adenomas that have been left untreated for long periods of time
- Macroscopically, these tumors are nodular or cystic, without encapsulation.
- The sectioned tumor appears similar to pleomorphic adenoma except for the presence of necrosis and hemorrhage associated with the malignant tumor

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ASSESSMENT

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i. All are features of SS except
   a. Dry eyes
   b. Dry mouth
   c. Rheumatoid arthritis
   d. Sialorrhea

ii. Bacterial sialadenitis is common in
   a. Parotid
   b. Submandibular
   c. Minor SG
   d. Sublingual

iii. Mumps is caused by
   a. Ebstein Barr Virus
   b. Human Papilloma Virus
   c. Cytomegalo Virus
   d. Paramyxovirus

iv. Most common benign salivary gland tumour

a. Adenoid cystic carcinoma
b. Warthin,s tumour
c. Pleomorphic adenoma
d. Oncocytoma

v. Pus discharge from SG duct opening seen in

a. Sjogren syndrome
b. Mumps
c. Sialadenosis
d. Bacterial sialadenitis

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