

SALIVARY GLAND DISEASES

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Normal function and health of the mouth depend on normal secretion of saliva by the major and minor glands. Failure of salivary secretion causes a dry mouth (xerostomia) which is promotes oral infection.

Salivary gland anatomy and physiology:

Saliva is the product of the major and minor salivary glands and is highly complex mixture of water and organic and nonorganic components, the saliva is highly modified and it is carried via a branching duct system into the oral cavity.

Acinar cells of Salivary Glands: Classified as either:

- Serous cells: produce a thin watery secretion
- Mucous cells: produce a more viscous secretion.

Salivary gland secretary unit:

- Composed of terminal acini
- Intercalated, striated and excretory ducts
- Myoepithelial cells

The major Salivary gland is paired structures and includes the parotid, submandibular and sublingual .

Parotid: serous

Submandibular: mucous & serous

Sublingual: mucous

Salivary function:

- Aid in mastication, deglutination
- Salivary lysozyme, IgA and other antibacterial substances protect against caries and oral cavity infections
- Saliva also aids in speech

Anatomy of the parotid gland:

CN VII branches roughly divide the PG into superficial and deep lobes while coursing anteriorly from the stylomastoid foramen to the muscles of facial expression. While the submandibular gland is located in the submandibular triangle of the neck, inferior & lateral to mylohyoid muscle. The posterior-superior portion of the gland curves up around the posterior border of the mylohyoid and gives rise to Wharton's duct. The sublingual gland lies on the superior surface of the mylohyoid muscle and are separated from the oral cavity by a thin layer of mucosa.

Investigative methods:

- Sialometry: measure the amount of saliva produced in a certain time.
- Sialochemistry: measure the composition of the saliva.
- Sialography: by introduce the iodine-containing contrast medium through the opening of their duct.
- Sonography: using ultrasonic pattern.
- Cytology & Biopsy: (Sjogren's syndrome & lymphoma)
- Scintigraphy: using radioactive isotopes to demonstrate the function of the SG. (i.v injection of Technetium Tc-99)
- Computed Tomography and MRI.
- Curry's test :(given the patient 5mg pilocarpine i.v and saliva is collected and calculated).
- Serologic evaluation: as in sjogren's syndrome, IgG, ESR.

Specific Diseases and Disorders of the Salivary Glands:

- Developmental Abnormalities
- Sialolithiasis (Salivary Stones) (Obstructive Disorders).
- Extravasation and Retention Mucoceles and Ranulas (Obstructive Disorders)
- Inflammatory and Reactive Lesions
- Allergic Sialadenitis
- Viral Diseases
- Bacterial Sialadenitis
- Systemic Conditions with salivary gland involvement.

1. Developmental Abnormalities

- Complete absence (aplasia or agenesis) of salivary glands (rare)
- Accessory Salivary Ducts (are common and do not require treatment)
- Darier's Disease (Salivary duct abnormalities). Sialography of parotid glands in this condition revealed duct dilation, with periodic stricture affecting the main ducts.

2. Sialolithiasis or salivary stone:

Sialoliths are calcified organic materials, results in a mechanical obstruction of the salivary duct is the major cause of unilateral diffuse parotid or submandibular gland swelling .

The etiology of sialolith formation is still unknown, yet several factors that cause pooling of saliva within the duct are known to contribute to stone formation:

Inflammation.

Irregularities in the duct system .

Local irritants .

Anticholinergic medications.

Increase serum calcium.

Thought an initial organic nidus that progressively grows by deposition of layers of inorganic and organic substances. May eventually obstruct flow of saliva from the gland to the oral cavity.

Salivary stone occurs at sub-mandibular gland (80-90%) due to:

- the torturous course of Wharton's duct
- higher calcium and phosphate level
- Position of the submandibular glands, which leaves them prone to stasis.

Clinical features:

- Acute, painful and intermittent swelling of the affected salivary gland.
- The ductal obstruction may occur at meal time when saliva producing is at its maximum, the resultant swelling is sudden and can be painful .
- Gradually reduction of the swelling can result but it recurs repeatedly when flow is stimulated.

- Tender.
- Fistulae, a sinus tract, or ulceration may occur over the stone in chronic cases.

Diagnostic approaches:

- Plain occlusal film: Effective for intraductal stones.
- CT Scan and Ultrasound.
- Sialoendoscopy for visualizing and removing sialoliths (less than 1mm diameter)

Sialolithiasis Treatment:

- During the acute phase, therapy is primarily supportive. Standard care includes analgesics, hydration, antibiotics, and antipyretics, as necessary.
- Stone excision.
- Gland excision.

3. Extravasation and Retention Mucoceles and Ranulas :

The most type of salivary and soft tissue cyst is the extravasation mucocele, mainly affect the minor salivary glands. It is a swelling caused by pooling of saliva at the site of a traumatized or obstructed minor salivary gland duct. Lower lip is the common site.

It is divided into two types:

Mucous extravasation type: due to laceration of minor salivary glands duct by trauma.

Mucous retention type: due to obstruction of minor S.G. ducts which cause back up of saliva.

Extravasation: is the leakage of fluid from the ducts or acini into the surrounding tissue.

Retention: narrowed ductal opening that cannot adequately accommodate the exit of saliva produced, leading to ductal dilation and surface swelling.

Mucoceles:

Clinical features: Superficial, painless, smooth-surfaced swellings that can range from a few millimeters to a few centimeters in diameter, rounded swelling, fluctuant and bluish due to the thin wall.

Treatment: mucocele should be excised with the underlining gland.

Ranulas: (larger form of mucocele) : Is a term used for mucoceles that occur in the floor of the mouth (sub-lingual or submandibular salivary glands).

Clinical features : Ranulas are unilateral (2-3cm); slow-growing, soft, and movable mass located in the floor of the mouth, painless but may interfere with speech or mastication .They tend to be larger than mucocele & can fill the floor of mouth & elevate tongue and located lateral to the midline. If the lesion extends deep into the soft tissue, it can cross the midline. Superficial ranula can have a bluish in color, but when the lesion is deeply seated, the mucosa may have a normal appearance.

Treatment:

Marsupialization due to the excessive recurrence rate of 60-70% and sublingual gland removal via intraoral approach. Postsurgical complications include lesion recurrence, sensory deficits of the tongue, and damage to Wharton's duct.

4. Salivary Gland Infections:

- Acute bacterial sialadenitis.
- Chronic bacterial sialadenitis.
- Viral infections.

Bacterial Sialadenitis: - represents inflammation mainly involving the acinoparenchyma of the gland . Acute infection more often affects the parotid gland than the submandibular gland (due to the presence of bacteria in dental plaque of upper 1nd molar which lies near parotid gland orifice). **It occurs in patient with:**

- Decreased salivary flow or following surgery.
- Dehydration.

- Restricted flow which will lead to bacterial colonization and invasion of the ducts.

Pathogenesis :

Retrograde contamination of the salivary ducts and parenchyma tissue by bacteria inhabiting the oral cavity. Stasis of salivary flow through the ducts and parenchyma promotes acute suppurative infection.

Acute Suppurative Parotitis:

Sudden onset of unilateral or bilateral enlargement of the pre/post auricular areas extends into the angle of the mandible .

Typical clinical features are:

Painful indurated swelling in one or both parotids, tenderness and erythematous skin of the involved gland .Fever, regional lymph nodes are enlarged and tender, purulent discharge exudes from parotid duct.

Treatment :Increase hydration and improve oral hygiene, Culture of the discharge and specific antibiotic and drainage.

Chronic Sialadenitis :

Is complication of duct obstruction, it's usually unilateral and asymptomatic or with painful swelling of the gland. The predisposing factors are a calculus or a stricture.

Treatment:

-Initial management should be conservative and includes the massage and antibiotics for acute exacerbations .

-Should conservative measures fail, consider removing the gland.

5. Viral diseases:

1. Mumps :Classically designates a viral parotitis caused by the RNA paramyxovirus and causes painful swelling of the parotid and sometime other glands.and is highly infectious and transmitted by direct contact with salivary droplets....

It is acute sialadenitis, sometimes with purulent discharge, endemic in the community, enters through upper respiratory tract. It affects school children from age 4-6 years and can affect older up to 40 years.

Clinical presentation :

Salivary gland inflammation and enlargement, unilateral then bilateral (within 1-5 days), peri-auricular pain, headache, fever, anorexia, malaise and myalgia .

- 90% the parotid is affected
- 10% the sub-mandibular is affected.

DIAGNOSIS: Is made by the demonstration of antibodies to the mumps S and V antigens and to the hemagglutination antigen. Serum amylase level may be elevated.

Treatment: is symptomatic, vaccination is important for prevention . Rare fatalities have occurred from viral encephalitis, myocarditis, and neuritis.

Complications : Mild meningitis, Encephalitis ,Deafness ,Pancreatitis , thyroiditis ,Infertility, Oophoritis ,Epididymitis and Orchitis ,Testicular atrophy and sterility.

2. HIV-SGD is salivary gland swelling, primarily in the parotid glands and frequently bilateral.

6. Allergic Sialadenitis: Enlargement of the salivary glands associated with exposure to various pharmaceutical agents and allergens. It is acute salivary gland enlargement, often accompanied by itching over the gland.

Treatment: Allergic sialadenitis is self-limiting. Avoiding the allergen and maintaining hydration.

7. Functional Disorders: may be either:

1. Sialorrhea (Ptyalism): (Increase in saliva flow)

- Physiological stimuli such as the smell or taste of food.
- Acute infection (herpetic gingivitis, pemphigus)
- Metal poisoning (mercury stomatitis).
- After surgery of oral.
- Drug such as pilocarpin, oral contraceptive pills.

-Psychological and neurological (mental retardation, epilepsy and facial paralysis.)

Treatment: Firstly find the underlying cause. In most condition give propanthen (15mg/day): anticholinergic drug.

2 .Xerostomia (Decrease in saliva flow)

Mumps, Sjogrens syndrome, post-irradiation.

Sjögren's Syndrome:

-Most common immunologic disorder (chronic autoimmune disease) associated with dryness of mouth (xerostomia) and dryness of the eyes (keratoconjunctivitis sicca), exocrine dysfunction and lymphocytic infiltration.

- 90% cases occur in women and average age of onset is 50 years. It is classified as primary or secondary.

- **Secondary** Sjögren's syndrome has salivary and/or lacrimal gland dysfunction in the setting of another connective tissue disease (eg, systemic lupus erythematosus, rheumatoid arthritis, scleroderma.)

- **Primary** Sjögren's syndrome is a systemic disorder that includes both lacrimal and salivary gland dysfunctions without another autoimmune condition.

The clinical feature :

-Is unilateral or bilateral salivary gland swelling occurs, may be permanent or intermittent .

-In early stages the mucosa appear moist but salivary flow rate is diminished then it appear dry, red shiny and the tongue is typically red , papillae atrophy and the dorsum becomes lobulated.

- Mucosa may be painful and sensitive to spices and heat.

-Patients often have dry, cracked lips and angular cheilitis.

- Coronal ulceration and conjunctivitis.

- Patient complains of dirt or foreign body in the eye.

- Increased incidence of dental caries and candidal infection.

- Increased incidence of bacterial sialadenitis.

Investigation and diagnosis:

- Salivary flow rate (stimulated parotid flow rate) is normally more than 1.5ml/min.
- Schirmer test: assess lacrimal flow if it is more than 0.5 ml/min.
- Immunological investigation, Rh factor, anti-Ro and anti-La.
- Sialography: variable degree of sialiectasis found in patients with SS.
- Labial gland biopsy: focal lymphocytic sialadenitis, ductal dilation and periductal fibrosis. (Best sole diagnostic criterion).
- MRI or CT can be helpful also. In sialography a snowstorm appearances of contrast medium due to leakage of contrast material through the ductal wall.
- Lip biopsy is important to avoid the risks of damage to the facial nerve or parotid fistula.

Treatment:

- Artificial saliva, oral rinses and gels, mouthwashes and water sipping due to Xerostomia .
- Salivary stimulants: chewing sugar-free gum or lemon.
- Pilocarpine (5mg) and Cevimeline (30mg). Both medications are muscarinic agonists and give 3 times /day.
- Preventive dental care: flouride rinse, dental hygiene measures (candidal infection)
- Periodic ophthalmological exam. (Dry eyes are best managed by periodic use of artificial tears.
- Antibiotic in case of episodes of bacterial sialadenitis.

Sialadenosis: Non-specific term used to describe a non-inflammatory non-neoplastic enlargement of a salivary gland, usually the parotid.

Condition associated with Sialadenosis:

- Endocrine disorders (DM, Diabetes insipidus, hypothyroidism).
- Nutritional conditions (general malnutrition, alcoholism.)
- Neurogenic medications (antihypertensive drugs and sympathomimetic drugs used for treating asthma) .

Radiation Injury :Salivary glands are often within the field of radiation therapy for head and neck cancers, the low dose radiation to a salivary gland causes an acute tender and painful swelling within 24 hrs.

-Serous cells are especially sensitive and exhibit marked degranulation and disruption.

- Continued irradiation leads to complete destruction of the serous acini and subsequent atrophy of the gland.

Oral Medicine

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