Salivary gland disorders

Dr. Suhail Al-Amad

16th Nov 2019

21st Nov 2019

Salivary Gland Disorders

Inflammatory Iatrogenic	Disturbances in saliva flow	Systemic diseases
Viral sialadenitis	Xerostomia	Sjogren's syndrome
Bacterial sialadenitis	Sialorrhoea	Sarcoidosis
Radiation sialadenitis		Sialosis

Saliva,

- Saliva is an exocrinal secretion that is produced by the major and minor salivary glands.
- Both quantity and quality of saliva are major factors in determining oral and dental health.
- Quantity → >0.5ml/5 minute (un-stimulated)
- Total daily salivary flow is 500-600ml/day

Quantity;

	Duration	Amount
Sleep	7 hours	40ml
Awake	16 hours (unstimulated)	300ml
	60 minutes (stimulated)	**200ml**

Quality;

Varies mainly by glycoprotein content;

Parotid is serous, while SM, SL and Minor are mixed.

Unstimulated salivary flow rate → 65% produced by SM gland (serous and mucous), 15-20% from Parotid. **Saliva is relatively mucous**

Stimulated salivary flow rate → 45-50% Parotid gland. **Saliva is relatively serous**

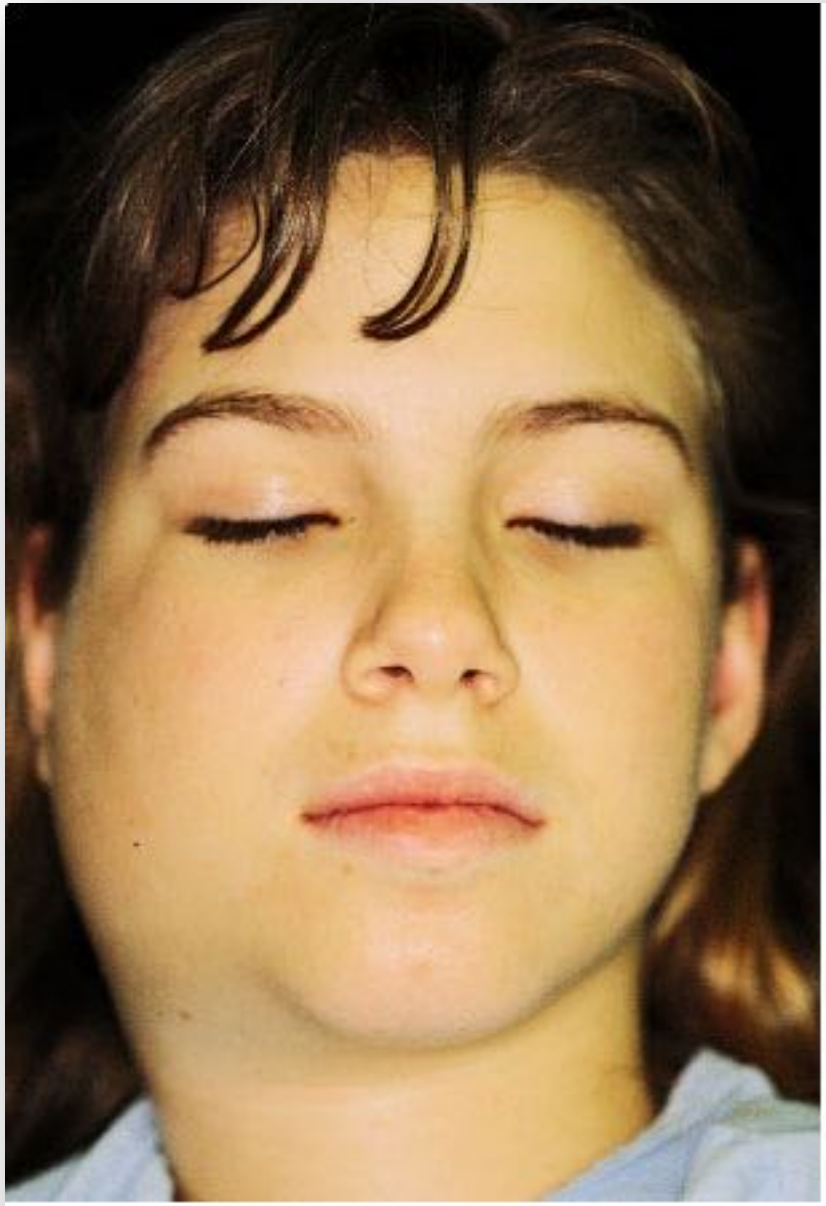
Source: McPhee SJ, Papadakis MA: *Current Medical Diagnosis and Treatment 2009*, 48th Edition: http://www.accessmedicine.com

Mumps

- Affects mainly parotid gland
- 70% of cases are bilateral
- Caused by paramyxovirus (RNA); 2-3 weeks IP
- Transmitted by direct contact with salivary droplets
- Has an acute onset with preauricular pain and swelling, difficulty swallowing and fever.
- Symptoms develop over 2-3 days then resolve over next 7-10 days
- Pain exacerbated upon eating due to partial blockage of Stensen's duct

Mumps

- Management is symptomatic, and corticosteroids may be used in severe cases to prevent complications
- Complication – orchitis and oophoritis, encephalitis, myocarditis and nephritis



Source: Knoop KJ, Stack LB, Storrow AB: *Atlas of Emergency Medicine*, 2nd Edition: http://www.accessemergencymedicine.com

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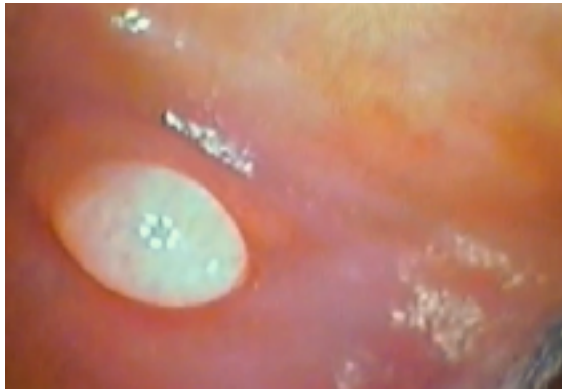
Acute Bacterial Sialadenitis

- Ascending duct infection may be caused by a variety of organisms
  - e.g. *Strep pyogenes* or *Staph aureus*
- Predisposing factors
  - post-surgery, xerostomia, sialolith
- Usually parotid, unilateral or bilateral
- Symptoms may include pain, swelling, trismus and fever
- Management as for any acute infection
  - Copious water intake
  - Avoid reasons for dry mouth
  - Antibiotics



Radiation-induced sialadenitis

Acute radiation sialadenitis

- 24-36 hours, depending on degree of radiation, may last for up to 1 week.
- Swelling, pain, xerostomia.
- Acute inflammation of the gland stroma and early necrosis of acini.

Radiation-induced sialadenitis

Chronic radiation sialadenitis

- Persistent xerostomia, usually no pain.
- Can be permanent, depending on extent of damage to the gland.
- Fibrosis, acinar atropy.
- Long term management: monitor stomatitis and caries status.

^{131}I-induced sialadenitis

- ^{131}I is used to treat thyroid cancer
- Mainly affects the parotids
- Results in narrowing of the duct
  - pain and swelling of the parotid, more when eating
  - dry mouth
- Monitor stomatitis and caries status
- Prescribe antibiotics if a secondary bacterial infection is suspected
- Copious water, and massage the glands

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~~Radiation sialadenitis~~		Sialosis

Xerostomia

- Xerostomia is the most common salivary problem.
- Hyposalivation will result in complications that can be summarized in two major groups;
  - ➢Lack of lubrication
  - ➢Infections (to salivary glands, mucosa and teeth (dental caries))
- Can be caused by;
  - ➢Reduction in saliva quantity
  - ➢Change in saliva quality (reduced serous content)
  - ➢Subjective

Xerostomia

causes;

Iatrogenic;

- Drugs
  - Anti-histamines
  - Anti-depressants
  - Anti-psychotics
  - Others…
- Parotidectomy
- RT
- CT
- GVHD

Systemic disease;

- Aplasia
- Sjogren's syndrome
- Primary biliary cirrhosis
- Cystic fibrosis
- Sarcoidosis
- HIV
- HCV
- Dehydration

Psychogenic;

- Subjective
- Anxiety and depressive disorders

Xerostomia
complications;

Lack of lubrication;
- Swallowing dry food (cracker sign)
- Poor denture retention
- Difficulty in speaking
- Disturbed taste
- Poor mechanical cleaning

Infections;
- Dental caries
- Candidosis
- Angular cheilitis
- Ascending sialadenitis

Xerostomia
diagnosis;

- Sialometry:
  - ➢quantitative measurement of unstimulated/stimulated salivary flow rate
    - N= >3.5ml in 5 minutes (stimulated)
    - N= >0.5ml in 5 minutes (unstimulated)
  - ➢variation in general population, variation according to time of day, eating and smoking
- Sialography:
  - ➢useful in case of obstruction
  - ➢the procedure carries a risk of infection and discomfort
- Scintigraphy (radioisotope imaging):
  - ➢Investigates all glands at once and is non-invasive
  - ➢But expensive, hardly available and has risk of radiation.

Xerostomia

treatment;

- Identify the cause of xerostomia;
  - ➢Drugs → change
  - ➢Infections, dehydration, anxiety…etc → treat
- Use artificial saliva and oral lubricants
- Encourage salivation → sugar-free gums and sialogogue
- Prevent or reduce complication (candida, dental caries…etc)

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Sialorrehoea

- Uncommon complaint
- Can be **acute** and transient → wearing of a new denture, oral infections (e.g. HSV), RAS…
- Or **episodic** → GORD (GERD) to buffer stomach acidity (in this case called "water brash")
- Or **constant** → rabies, heavy metal poisoning and some drugs (lithium and cholinergic agonists)
- Or **permanent** → poor neurological control, such as in CP, mandibular or tongue resection…

Sialorrehoea

- Treatment;
  - ➢No treatment for transient sialorrhoea
  - ➢In other cases of sialorrhoea, the cause should be identified and treated (GORD, rabies, poisoning…etc)
  - ➢Anticholinergic drugs can be useful, but have side effects
  - ➢Surgical treatment in severe cases → duct litigation, gland removal or relocation, neurectomy to p.sympathatic nerves (tympanic and chorda tympani)

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Sjögren's Syndrome

- Named after the Swedish eye doctor, Dr. Henrik Sjögren.
- An auto-immune disorder.
- Characterized by dry eyes (xerophthalmia or keratoconjuctivitis sicca) and dry mouth (xerostomia).
- Symptoms occur as a result of destruction of exocrine parynchyma by lymphocytes.
- Glands affected are the lacrimal, salivary and Bartholin's glands in the vagina.

Sjögren's syndrome

- Aetiology;
  - ➢Unclear, but the consistent picture is a polyclonal B-cell hyperactivity that is related to loss of T-cell regulation.
  - ➢Retroviruses and EBV have a have been linked, but evidence is poor.
  - ➢Association with HLA-DR4 (secondary SS) and HLA-B8 and HLA-DR3 (in primary SS)

Sjögren's Syndrome

- Clinically;
  - ➢SS is seen in women mainly (9:1)
  - ➢Peak age is 50 years
  - ➢Manifestations:
    - ➢ Parotid gland enlargement
    - ➢Xerostomia
      - dental decay
      - gingival inflammation
      - fungal infection
      - loss of denture retention
      - salivary gland infection

Sjögren's syndrome

- Two clinical forms of SS;

Primary SS

Exocrinopathy;

➢salivary
➢lacrimal
➢bartholin's glands
➢sweat glands (to some extent)

Secondary SS

Exocrinopathy + connective tissue disease;

➢RA
➢SLE
➢Polymyositis
➢Primary billiary cirrhosis
➢Scleroderma SD

Sjögren's syndrome

- Diagnosis;

  Diagnostic criteria require two of the following three:

  - ➢Positive serum antibodies
    - ➢anti-SSA/Ro and/or anti-SSB/La, or
    - ➢positive rheumatoid factor and ANA titre = 1:320
  - ➢Labial salivary gland biopsy exhibiting focal lymphocytic sialadenitis with a focus score 1 focus/4 mm^2
  - ➢Keratoconjunctivitis sicca with ocular staining score 3
    - ➢(assuming that individual is not currently using daily eye drops for glaucoma and has not had corneal surgery or cosmetic eyelid surgery in the last 5 years)

Schirmer’s test

Image course: AAFP.org

Sjögren's syndrome

Significance;

- Malignant transformation (occurs in 5% of SS patients)
  - ➢Increased risk of Mucosa-Associated Lymphoid Tissue (MALT) malignancy
  - ➢Risk greater in primary Sjogren's
  - ➢In SS MALT tumours can arise in salivary glands, mouth, stomach, skin, lungs, lymph nodes.

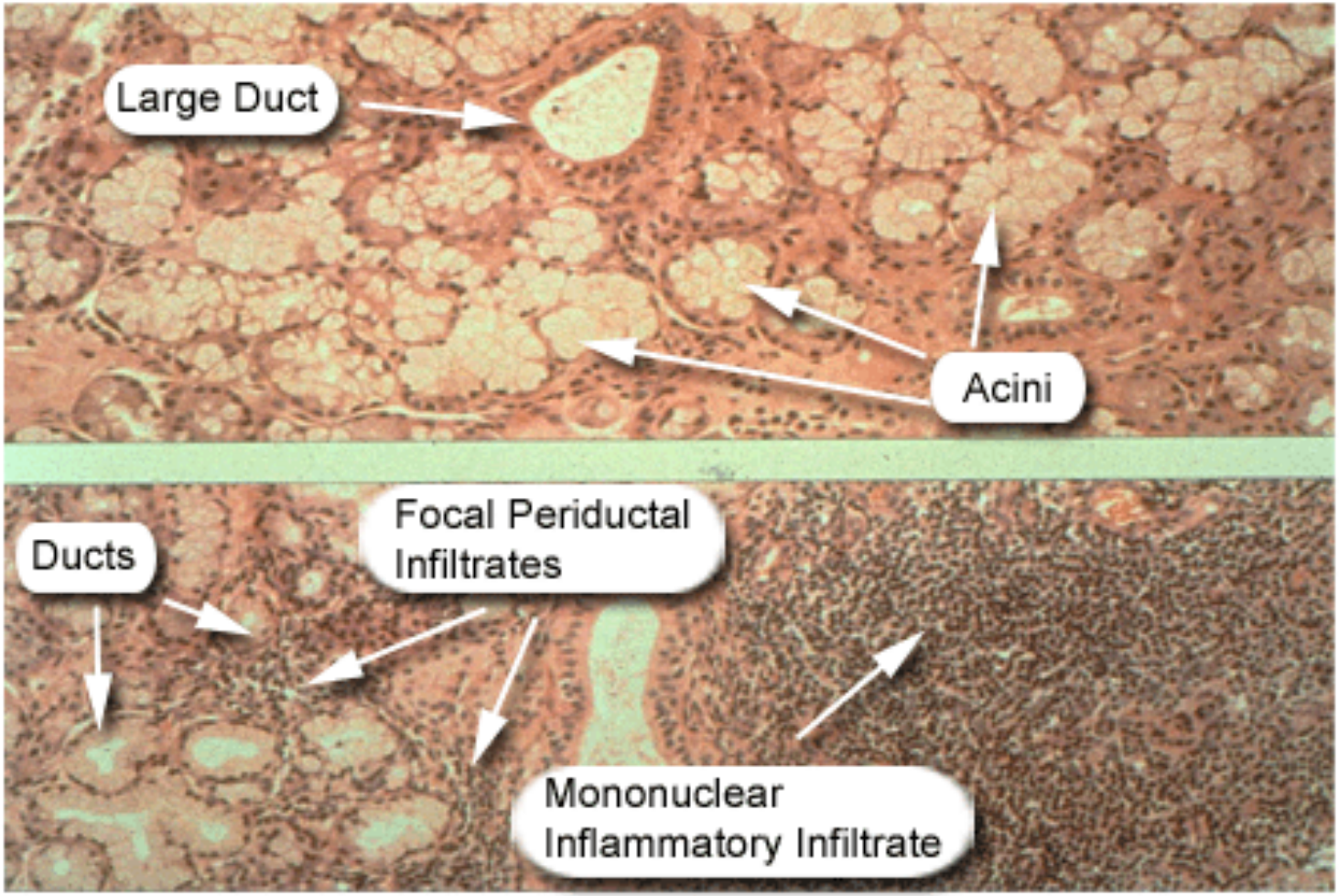

Image source: painconsorium.nih.gov

Histopathology

- Minor gland biopsy
- Salivary gland parenchyma is replaced by a benign lymphocytic infiltrate
- Features;
  - Focal sialadenitis
  - Fibrosis
  - Fatty atrophy
  - Duct dilatation and hyperplasia
- To achieve the diagnostic criterion;
  - > 1 focus in $4mm^2$ is suggestive of SS
  - A "focus" is defined as an aggregate of 50 or more mononuclear cells (T helper lymphocytes)

Complications

Candidiasis

- Oral mucosa
- Angular cheilitis

Images source: University of Adelaide

Complications

- Salivary gland enlargement
- Bacterial infections
- Increased risk of lymphoma

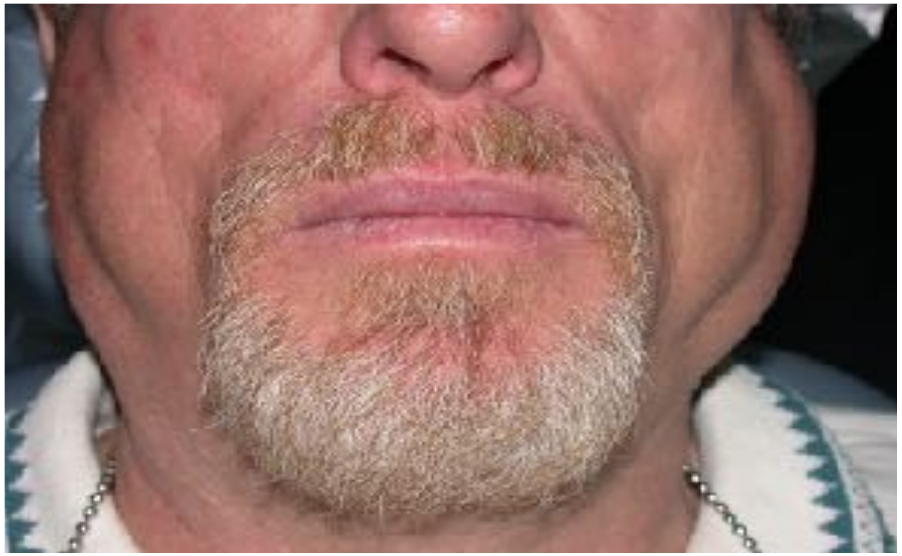

Image source: University of Adelaide

Management

- Patient information
- Assessment by physician
- Regular follow-up

- Palliation of oral symptoms
  - Saliva substitutes
  - Dietary advice
  - Fluoride programs
  - Management of infections

Images source: University of Adelaide

Sarcoidosis

- A granulomatous disease which affects multiple organs
- Granulomas are non-cassiating epithelioid, probably a poorly degraded antigenic material
- Most common organs involved are;
  - ➢Lymphoid → 100%
  - ➢Pulmonary → 90%
  - ➢Skin → 25%
  - ➢Eyes → 25%
  - ➢Salivary glands → less frequent

Sarcoidosis

- Incidence between 1-40 per 100,000
- More frequent in developed countries
- Age of onset 20-40 y
- Slight predilection to females, mainly African American
- The course of sarcoidosis is variable, ranging from self-limited acute disease to a chronic debilitating disease that may result in death.
- 20% are asymptomatic

Sarcoidosis

- Aetiology;
  - ➢Aggressive antigens that the body is not able to degrade, or
  - ➢Defective immune system, or
  - ➢Both
    - →Atypical mycobacteria was seen frequently in patients with sarcoidosis
    - →Patients are anergic (low sensitization)
    - →Genetic susceptibility → HLA-B7, HLA-B5, HLA-A9

Diagnosis;

- Clinically;
  - ➢Disease vary from self-limiting to fatal.
  - ➢General symptoms → fatigue, lethargy, anorexia
  - ➢Organ-specific symptoms
    - Pulmonary →bilateral hilar lymphadenopathy → fibrosis → respiratory failure → death
    - Skin → erythema nodosum
    - Eye → uveitis
    - Liver → granulomas
    - Bone → erosions in cancellous bone
    - Other soft tissues → nodular swellings

Diagnosis;

- Radiologically;
  - ➢Bilateral radio-opacity on chest X-ray

- Blood;
  - ➢↑ Ca^{+2}
  - ➢↑ Angiotensin I converting enzyme
  - ➢↑ lysozyme
  - ➢↑ adenosine deaminase

Diagnosis;

- Histopathology;
  - ➢Non-caseating granulomas
  - ➢Epithelioid multi-nucleated giant cells
  - ➢Diffuse lymphocytic infiltration

Treatment;

- Most cases require no treatment
- Prognosis is generally good
- Coricosteroids are the first line of treatment
- Chloroquine and immune-modulating agents can be used

Metabolic Disorders

- Age Changes
- Sialosis

Age Changes

Most are seen at the histological level and include:

- acinar atrophy (leaving ducts)
- fibrosis
- fatty infiltration
- diffuse chronic inflammatory infiltrate
  - lymphocytes, plasma cells

Sialosis

- Non-inflammatory, non-neoplastic recurrent bilateral swelling of the salivary glands
- usually painless
- aetiology unknown but has been reported as occurring in association with:
  - hormonal disturbances
  - diabetes
  - malnutrition
  - liver cirrhosis
  - medications eg. phenylbutazone (anti-inflammatory), Iodine containing drugs
  - alcohol

Sialosis

Histopathology

- serous cell hypertrophy with decrease in granularity
- stromal oedema
- fatty replacement

Management

- determine cause (if possible) and treat accordingly

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