DISORDERS OF THE SALIVARY GLANDS
Surgical anatomy and benign lesions
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S IV
• There are three pairs of major salivary glands, two parotids, two submandibulars, and two sublinguals.

• Besides, numerous minor salivary glands are distributed in the mucosa of the upper lips, cheeks, palate, floor of the mouth and retromolar area.
Surgical anatomy of the parotid gland

- It is situated in a recess bounded by the ramus of the mandible, base of skull and the mastoid process. It lies on the carotid sheath, XI and XII cranial nerves and extends forwards over the masseter muscle. Upper pole goes just below the zygoma and the lower pole into the neck.
Surgical anatomy of the parotid gland contd.

• The following structures run through the parotid.

1. Branches of the facial nerve.
2. Terminal branch of the external carotid artery, dividing into maxillary and superficial temporal arteries.
3. Retromandibular vein.
4. Intra parotid lymph nodes.
Surgical anatomy of the parotid gland contd.

- The facial nerve emerges from the stylomastoid foramen and lies deeply in the angle between the bony external auditory meatus and the mastoid process. It passes forwards around the neck of the condyle of the mandible and rapidly becomes superficial. As it does so, it divides into an upper temporofacial division and a lower cervicofacial division and then subsequently into a varying number of branches, some of which may be interconnected.

- The external carotid artery and its terminal branches are in a deeper plane.

- The retromandibular vein lies between the artery and the nerve.
The gland is divided into a superficial lobe and a deep lobe by branches of the facial nerve. The deep lobe lies in the parapharyngeal space.
Surgical anatomy of the parotid gland contd.

- It has a true capsule which is a condensation of the fibrous stroma of the gland. There is another false capsule formed by the splitting of the deep cervical fascia.
Surgical anatomy of the parotid gland contd.

- The parotid duct (Stensen’s duct) is about 5 cm long. It emerges from the anterior border of the gland, runs over the masseter, bends inwards between the fibres of the buccinator and then runs forwards submucosally to open into the mouth via a small papilla on the inside of the cheek, opposite the upper second molar tooth.
Surgical anatomy of the submandibular gland

• The gland lies in the submandibular triangle, above and between the two bellies of the digastric muscle. It is divided into a superficial lobe and a deep lobe by the mylohyoid muscle. The duct (Wharton’s duct), about 5 cm long, runs forwards from the deep lobe to enter the floor of the mouth on a papilla beside the frenulum of the tongue.
Surgical anatomy of the submandibular gland contd.

- The lingual nerve and the submandibular ganglion are related to the upper pole of the gland. Hyoglossus and hypoglossal nerve are related to its deep surface. The facial artery makes a groove in the posterior aspect of the deep lobe and then passes upwards to gain the lateral surface the gland. The facial vein and marginal mandibular branch of facial nerve are superficial.
Sublingual glands

• The sublingual glands lie in the anterior part of the floor of the mouth between the mylohyoid muscle and the body of the mandible in the premolar region. Their ducts open directly into the oral cavity or into the duct of the submandibular gland.
Saliva

- Saliva is a mixture of serous and mucous secretions. It helps moistening of the food, lubrication of the oral cavity, maintains oral hygiene. It contains antibodies and initiates digestion of starch. About 1500 ml is produced daily, 90% by the parotids and the submandibulars. Saliva produced by the parotid is purely serous; that of the sublingual glands is mainly mucous; and that of the submandibular gland is a mixture of both.
A blunt cannula or catheter is inserted into the papilla and 0.5 to 2 ml of a water soluble dye (Hypaque or sodium diatrizoate) is injected and x-rays are taken. It is useful to diagnose strictures and dilatations of the duct, sialectasis and stones in the duct.
Cysts of minor salivary glands

- Most of the cysts in relation to minor salivary glands are retention cysts and need excision.

- An extravasation cyst arising from sublingual gland is called *ranula*. It occurs as a soft cystic swelling in the floor of the mouth near the frenulum. Sometimes, it may be large and dumb-bell shaped, having an extension into the submental or submandibular region. This is called a *plunging ranula*. A ranula needs excision along with the offending salivary gland or marsupialisation.
Non neoplastic enlargement of the salivary gland

- **Inflammatory**
  - Acute viral sialadenitis (mumps)
  - Acute bacterial sialadenitis
  - Chronic granulomatous sialadenitis
  - Tuberculosis
  - Sarcoidosis
  - Actinomycosis
  - Histoplasmosis
  - Toxoplasmosis
  - Secondary syphilis
  - Cat scratch disease
  - AIDS

- **Autoimmune**
  - Sjogren’s syndrome

- **Obstruction**
  - Stones
  - Mucous plugs
  - Congenital cysts
  - Strictures

- **Systemic disease (Sialosis)**
  - Malnutrition
  - Alcoholism
  - Diabetes, Acromegaly
  - Cirrhosis
  - Drug hypersensitivity
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Acute viral parotitis (Mumps)

- Mumps is the usual cause of viral parotitis, but other viruses like Coxsackie A virus may also produce similar illness. There may be simultaneous affection of other organs like testes, ovaries and pancreas. The infection is often bilateral. There is a painful swelling of the gland lasting for 4-5 days, associated with constitutional symptoms. One attack confers lifelong immunity. Does not suppurate.
Acute suppurative parotitis

• This is due to reduced salivary flow which is common following dehydration associated with major surgeries, during debilitating illnesses like typhoid and cholera and following radiotherapy. It can also occur following obstruction of the duct by stones or stenosis. Common organisms are Staphylococcus aureus or Streptococcus viridans. Infection ascends from oral cavity through the duct.
Acute suppurative parotitis

contd.

• There is a brawny swelling of the side of the face. The swelling corresponds to the shape of the gland and raises the ear lobe. Widespread cellulites occurs, skin becomes red and pus could be expressed from the Stensen’s duct. Temperature is above 37.8 degree.
Acute suppurative parotitis

Management contd.

- Antibiotics are given. Oral hygiene should be attended to. The gland can be gently massaged to express pus through the duct. If pus fails to drain through the duct and there is no improvement, drainage should be done without waiting for fluctuation. The incision is a vertical one in front of the tragus, curves under the lobe of the ear. Sinus forceps are thrust through the fascia and opened to effect drainage. A corrugated drain is inserted. (Hilton’s method of drainage).
Recurrent subacute parotitis of childhood

- Mild swelling and pain occurs in one of the parotid glands. History of previous attacks may be present. The attack lasts for 10-14 days. Sialogram reveals an appearance of multiple, small proximal dilatations like a “snowstorm”. This appearance is called punctate sialectasis. It is managed by antibiotics during the acute attack. It remits spontaneously after the age of 15 years.
Obstruction to the duct of a major salivary gland

• The characteristic symptom is recurrent painful swelling of the affected gland at meal times. The causes for obstruction include salivary calculi, strictures of the duct, oedema or fibrosis of the papilla, pressure on the duct due to an adjacent mass, or invasion of the duct by a malignant neoplasm.
Obstruction to the duct of a major salivary gland contd.

- Calculi are more common in the submandibular gland as the secretion is rich in minerals and more viscous. The drainage is against gravity.

- The stone can be demonstrated by a plain x-ray or sialogram. Calculus in the duct is removed by an intraoral incision. Calculi in the gland associated with chronic infection need removal of the gland.
Sjogren’s syndrome

• Sjogren’s syndrome is characterized by dry eyes (keratoconjunctivitis sicca), dry mouth (xerostomia), and rheumatoid arthritis. Other connective tissue disorders like systemic lupus erythematosus and scleroderma may be associated with this. In these patients, the salivary glands and lacrimal glands are infiltrated with lymphocytes and the acini are destroyed. Duct epithelium proliferates, blocking smaller ducts. Diffuse enlargement of the lacrimal and salivary glands could be seen. Mouth becomes dry. Lips, tongue and palate stick together. Tongue becomes cracked and attacks of monilial stomatitis occur. Severe dental caries can occur.

• Auto antibodies can be demonstrated in the serum. Labial biopsy confirms diagnosis.
Sjogren’s syndrome
Contd.

• Mikulicz disease is a clinical variant of Sjogren’s syndrome.

• Management is by instillation of artificial tears and frequent mouth washes consisting of methyl cellulose.

• Lymphomas commonly occur in these patients.
Frey’s syndrome

- **Auriculo temporal syndrome**

  - This is also known as gustatory sweating. One of the complications of superficial parotidectomy. This is due to inappropriate regeneration of the parasympathetic nerve fibres, which start stimulating the sweat glands instead of the parotid. There is sweating and flushing of the face while eating.

  - Management is by  
    a) Antiperspirants, usually astringents such as aluminium chloride,  
    b) Injection of botulinum toxin into the affected skin and  
    c) Tympanic neurectomy.
Parotid fistula

- Fistulae of the parotid may result from injuries to the cheek or faulty surgery.
- Patients present with discharge of saliva from a sinus in the cheek at meal time.
- Sialogram is done to assess the fistula.
- Fistulae which arise from gland parenchyma tend to close spontaneously.
- Those arising from the duct have to be repaired.
Parotid gland
Parotid gland
SUBMANDIBULAR GLAND
RANULA
RETENTION CYST
SM gland calculus (Plain x-ray)
Mikulicz’s disease