

OBJECTIVE

- Introduction.
- Anatomy.
- Disorders of glands.
- Clinical approach.
- Surgical aspect.

INTRODUCTION

Salivary glands:

are composed of 4 major glands, in addition to minor glands.

Major:

•2 parotid glands. •2submandibular gland

Minor:

Sublingual.Multiple minor glands



ANATOMY PAROTID GLAND



Important structure that run through the parotid gland:

- 1. Branch of facial nerve.
- 2. Terminal branch of external carotid artery that divided into maxillary & superficial temporal artery.
- 3. The retromandibular vein (post. Facial).
- 4. Intraparotid lymph node.





THE PAROTID DUCT • Stensen's duct is 5 cm long. open opposite the second upper molar tooth Parotid duct

SUBMANDIBULAR GLAND

- It's paired of gland that lie below the mandible on either side.
- Has 2 lobes, superficial & deep.
- <u>Warthon's duct</u>, drained submandibular gland that opens into anterior floor of mouth.

Anatomical relationship:

- 1. Lingual nerve.
- 2. Hypoglossal nerve.
- 3. Anterior facial vein.
- 4. Facial artery.
- 5. Marginal mandibular branch of facial nerve.



SUBLINGUAL GLAND

• Lie on the superior surface of the mylohyoid muscle and are separated from the oral cavity by a thin layer of mucosa.

• The ducts of the sublingual glands are called **Bartholin's ducts**.



MINOR SALIVARY GLAND

- About 450 lie under the mucosa
- They are distirbuted in the mucosa of the lips, cheeks, palate, floor of mouth & retromolar area
- Also appear in oropharyanx, larynx & trachea

DISORDERS OF MINOR & SUBLINGUAL CYST SALIVARY GLAND

It's either:

•Extravasation cyst result from trauma to overlying mucosa.

•Mucous retention cyst in the floor of the mouth due to obstruction.

•**RANULA** extravasation cyst that arises from sublingual gland.





PLUNGING RANULA

- It is rare form of mucus retention cyst arise from both <u>sublingual & submandibular.</u>
- The mucus collects around the gland &penetrates the mylohyoid diaphragm to enter the neck.





TUMORS

• Tumors of minor & sublingual salivary gland are extremely rare.

• 90% are malignant.

• <u>Most common site:</u> upper lip, palate & retromolar region.

SUBMANDIBULAR GLAND



ECTOPIC ABERRAN'T SALIVARY GLAND TISSUE

- The most common ectopic tissue is called stafne tissue... (what is it?)
- Presentation
- Discovered by x-ray:
- treatment









DEVELOPMENTAL

• They extremly rare like agenesis, , duct atresia and congenital fistula formation...

INFLAMMATORY DISORDERS

A- viral infections: Mumps... Mode of infection Prodromal period Presentation Diagnosis Treatment is conservative Complications: Orchitis, oophoritis, pancreatitis, sensorineural deafness, nemimgoencephalitis but they are rare...

INFLAMMATORY DISORDERS (CONT.)

B- bacterial:

Precipitating factors??!

Causative organisms

Presentation



Treatment : conservative and it might eed drainage...

RECURRENT PAROTITIS OF CHILDHOOD:

- This occurs in 3-6 years of age and the symptoms last for 3-7 days accompanied with fever and malaise...
- Diagnosis is made by HX and sialography showing a characteristic snowstorm appearance...
- Treatment: -antibiotics

-prophylactic antibiotics-parotidectomy..



INFLAMMATORY DISORDERS (CONT)

C- chronic parotitis (HIV)?

- It is pathognomonic for HIV...
- Presentation : very similar to sjogran's syndrome...
- Differentiated by negative autoantibody...
- On investigation : CT and MRI show characteristic swiss cheese appearance of the cysts...

TRAUMA AND OBSTRUCTION

- Most common cause is sialolithiasis which 80% happens in the submandibular gland...
- Presentation: painful swelling in submandibular area
- What would aggreveate it?
- Clinical findings: tender, pus draining
- investigations : x-ray
- Treatment: surgical





TUMORS

- They are very rare in this gland and 50% are benign...
- Presentation
- Investigations: CT and MRI...
- Never do open biopsy but do FNA..
- Treatment is surgical...



<u>treatment:</u> <u>Surgery to improve the appearance</u> <u>although it's painless</u>



OBSTRUCTIVE PAROTITIS:

A- papillary obstruction: It less common than in submandibular gland... Most commonly due to trauma Presentation Treatment is papillotomy...

B- stone formation:

As mentioned before it is 80% in submandibular but only 20 % in parotid

Investigations:

position...

Treatment is surgical...



• The parotids are the commonest glands for tumors of salivary glands...

Slowly painless growing temor below the ear, or infront of it



Sometimes on the upper aspect of the neck



TUMORS (CONT)

- If it arised from the accessory lobe it will look like a presistant cheek swelling...
- If it arises from the deep lobe it will present as parapharyngeal mass...
- Symptoms:
- Difficult swallowing
- Snoring
- Clinical examination...



CLASSIFICATION

Table 47.2 Classification of salivary gland tumours (simplified)

Туре	Sub-group	Common examples
I Adenoma	Pleomorphic Monomorphic	Pleomorphic adenoma Adenolymphoma (Warthin's tumour)
II Carcinoma	Low grade	Acinic cell carcinoma Adenoid cystic carcinoma Low-grade muco-epidermoid carcinoma
	High grade	Adenocarcinoma Squamous cell carcinoma High-grade muco-epidermoid carcinoma
III Non-epithelial tumours		Haemangioma, lymphangioma
IV Lymphomas	Primary lymphomas Secondary lymphomas	Non-Hodgkin's lymphomas Lymphomas in Sjögren's syndrome
V Secondary tumours	Local Distant	Tumours of the head and neck especially Skin and bronchus
VI Unclassified tumours		
VII Tumour-like lesions	Solid lesions	Benign lymphoepithelial lesion Adenomatoid hyperplasia
	Cystic lesions	Salivary gland cysts
TUMORS (CONT)

Investigations:
CT AND MRI
FNA
OPEN BIOPSY IS
CONTRAINDICATED...

TREATMENT: SURGICAL...



OTHER RARE DISESASES

1-granulomatous sialadenitis:

- Mycobacterial infection:
- Sarcoidosis
- Cat scratch disease
- Toxoplasmosis
- Syphilis
- Deep mycosis
- Wgner's granulomatosis
- Allergic sialdenitis due to radiotherapy of the head and neck...

TUMOR LIKE DISEASES

- <u>They are a group of diseases that are hard to</u> <u>diagnose and are not under any group of the other</u> <u>diseases:</u>
- Sialadenosis
- Adenomatoid hyperplasia
- Multifocal adenomporphic adenomatosis

DEGENERATIVE DISEASES

- Sjogran's syndrome...:
- Benign lymphoepithilial lesions
- Xerostomia
- Sialorrhea

SJOGRAN'S SYNDROME

- It is an autoimmune condition causing progressive destruction of the salivary glands and the lacrimal glands.....
- Presentation is xerostomia and keratoconjunctivitis...
- They also present with pain and asendng infection
- .females more than males 10:1
- Parotis is more common

Primary Sjögren's syndrome

Secondary Sjögren's syndrome

Benign lymphoepithelial lesion

More severe xerostomia Widespread exocrine gland dysfunction No connective tissue disorder M:F: 1:10 Middle age Underlying connective tissue disorder

20% develop lymphoma Diffuse parotid swelling 20% bilateral



- The charachtaristic feature is progressive lymphocytic infiltration acinar cell destruction and prolifration of duct epithilium...
- Diagnosis based on history...
- Treatment remains symptomatic:

Artificial tears...

Salivary substituants or water...

Floride to avoid dental carries...

Complications are B cell lymphoma

XEROSTOMIA

- Normal salivary flow decreases with age...
- Mostly in woman postmenopausal complaining of burning tongue of mouth..
- Causes: -chronic anxiety and depression..

 -dehydration...
 -anticholinergic drugs...
 -sjogran's syndrome...
 -radiotherapy of the neck and head

SIALORRHEA

- <u>Causes</u>: some infections and drugs...
- Drooling:

In children that are mental handicap Also in cerebral palsy

Management is surgical...

Bilateral submandibular duct repositioning and sublingual duct excision...

Bilateral submandibualr gland excision...

Bilateral submandibualr gland excision and repositioning of the parotis duct...

HOW TO APPROACH THE PATIENT CLININALLY

- History.
- Clinical examination.
- Investigation.

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?



INSPECTION:

- Asymmetry (glands, face, neck)
- Diffuse or focal enlargement
- Erythema extra-orally
- Trismus
- Medial displacement of structures intraorally?
- Cranial nerve testing (Facial , Hypoglossal nerve)

CLINCAL EX.

PALPATION:

- Palpate for cervical lymphadenopathy
- Bimanual palpation of floor of mouth in a posterior to anterior direction
 - Have patient close mouth slightly & relax oral musculature to aid in detection
 - Examine for duct purulence
- Bimanual palpation of the gland (firm or spongy/elastic).

INVESTIGATION

- 1. Plain occlusal film.
- 2. CT Scan.
- 3. Ultrasound.
- 4. Sialography.
- 5. Radionuclide Studies.
- 6. Diagnostic Sialendoscopy²

PLAIN OCCLUSAL FILM



- Effective for intraductal stones, while....
- intraglandular, radiolucent or

small stones may be missed.



- Large stones or small CT slices done.
- Also used for inflammatory disorders

ULTRASOUND

• Operator dependent, can detect small stones

(>2mm), inexpensive, non-invasive

SIALAOGRAPHY

• Consists of opacification of the ducts by a retrograde injection of a water-soluble dye.

• Provides image of stones and duct morphological structure

• May be therapeutic, but success of therapeutic sialography never documented

SIALAOGRAPHY, CONT

• **Disadvantages:**

- Irradiation dose
- Pain with procedure
- Perforation
- Infection dye reaction
- Push stone further
- Contraindicated in active infection.



RADIONUCLIDE STUDY

• is useful preoperatively to determine if gland is functional.

SIALENDOSCOPY

- Allows complete exploration of the ductal system, direct visualization of duct pathology
- Success rate of $>95\%^2$
- Disadvantage: technically challenging, trauma could result in stenosis, perforation



SURGICAL APPROACHES TO SALIVARY GLANDS





TUMOR EXCISION: SUBMANDIBULAR GLAND

-intracapsular
dissection
-extracapsular
dissection...(su
prehyoid neck
dissection)







• So what are the indications of removal of the submandibular gland???

- Structures to be preserved:
- Facial nerve marginal branch
- Platysma muscle fibers...
- Facial artery
- Hypoglossal nerve...
- Lingual nerve
- Anterior facial vein should be ligated



COMPLICATIONS OF THE SURGERY

- Hematoma
- wound infection
- marginal mandibular nerve injury
- lingual nerve injusry
- hypoglossal nerve injury
- transection of the nerve to the myelohyoid muscle causing submental skin anesthesia...

PAROTID GLAND

• <u>Superficial parotidectomy:</u>

- If the tumor lies in the superficial lobe a superficial peotidectomy should be performed with preserving the facial nerve...
- It is the commonest procedure...



THE FACIAL NERVE TRUNK

- 1-the inferior portion of the cartilaginous canal called conley's pointer the facial nerve lies 1 cm deep and inferior to it's tip
- 2-the upper border of the posterior belly of the digastric muscle...
- The facial nerve is superior to it...
- A nerve stimulator might come in handy...



RADICAL PROTIDECTOMY

Whole gland is remover Facial nerve is transected Masseter muscle removed Neck dissection



COMPLICATIONS

- Hematoma
- Infection
- Temporary facial nerve weakness.
- Transection of the facial nerve and permenant facial weakness..
- Sialocele...
- Facial numbness.
- Permenant numbress of the ear lobe due to transection of the great auricular nerve...
- Frey's syndrome

FREY'S SYNDROME

- Cause...
- Prevention...
- Treatment is incidence...
- Antiperspirants like ALCL
- Denervation by tympanic neurectomy
- Injection of botulinum toxin to the skin area

CLASSIFICATION

>Tumors

Adenoma (Benign)
Carcinomas (malignant)
Others



CARCINOMA (MALIGNANT)

- Mucoepidermoid ca
- Acinic cell ca
- Adenoid cystic ca
- Ca arising in Pelomorphic adenoma
- Polymorphous low grade adenoca
- Basal cell carcinoma
- Sebaceous carcinoma
- Cystadenocarcinoma

OTHERS

 Soft tissue tumors Haemangioma

Lymphoma

Hodgkin lymphoma Diffuse large B-cell lymphoma Extranodal marginal B -cell lymphoma
















CLINCAL FEATURES yrs) Painless mass Mostly unilateral mobile.

Slow growing (may be present since many

- On palpation tumor is smooth, round and
- The growth is rubbery in consistency with overlying skin or mucosa intact











HISTOLOGY

- Tumor is typically well circumscribed
- Some times may be uncapsulated or infltarated with tumor cells
- Mixture of epithelial, myopeithelial and stromal components
 - Epithelial cells: nests, sheets, ducts, trabeculae
 - Stroma: myxoid, chrondroid, fibroid, osteoid
 - Tumor pseudopods





History
 Clinical examination
 Investigation
 Biopsy
 CT scan or MRI

TREATMENT

The tumor is highly implantable,

 Recurrence rate after primary surgery is about 5%.

 If simple enucleation is performed, the recurrence rate is between 20-30%.





CLINICAL PRESENTATION

Slow-growing, painless mass • Usually in the tail of parotid gland Fluctuant, smooth soft and compressible • Cystic once contain mucoid fluid Or some time solid in nature Older Males • 10% bilateral

GROSS PATHOLOGY

The tumor, at the right of the image, is welldemarcated from the adjacent parotid tissue and tends to shell out from it.



HISTOLOGY

- Composed of ductal epithelium & lymphoid stroma
- Inner luminal layer is consist of tall columnar cells with centrally placed hyperchromatic nuclei
- second layer is cuboidal cells
 - Stroma:
 - mature lymphoid follicles with germinal centers





RATING FOR S GLAND TUMORS

- Staging
- (Treatment plan)
- Grading
- (Prognosis)





- T = Tumor size
- N = Lymph node involvement
- M = metastasis



N - REPRESENTS LYMPHATIC NODE INVOLVEMENT

- NO No nodes
- N1 Single homolateral node smaller than 3 cm
- N2 Nodes(s) homolateral smaller than 6 cm
- N3 Nodes(s) larger than 6 cm and/or bilateral



GRADING OF SALIVARY GLAND TUMORS

- High Grade
- Low Grade
- High/low grade

(Well, Moderate, Poor Differentiated)

MALIGNANCY FEATURES

Usually tumor grows rapidly
Pain, Ulcerated,
Involvement of facial nerve
Involvement of skin
Involvement of L node
Metastasis: L,L,L
(Lung, Liver, Long Bone)





MUCOEPIDERMOID CA

- 4-9% of salivary gland tumors
- 3rd-8th decades,
- peak in 5th decade
- Females more common
- Most common salivary gland in children



GROSS PATHOLOGY

Well-circumscribed to partially encapsulated to unencapsulated Solid, cystic, mixed


HISTOLOGY

 Mixture of mucous secrecting cells which are Cubodail or columnar in nature & squamous cells





ADENOID CYSTIC CARCINOMA

- Overall 2nd most common malignancy
- Most common in minor salivary gland,
- Parotid gland,
- Submandibular gland,
- sublingual
- $\odot M = F$
- 5th decade





Well-circumscribed

Solid, rarely with cystic spaces Infiltrative





CRIBRIFORM PATTERN

- Basloid epithelial cells contain multiple cylindrical, cyst like spaces resemblimg swiss cheese appearance
- The tumor cells are small and cubiodal



TUBULAR PATTERN

Layered cells

forming multiple duct- or

tubules like within hyalinized

stroma



SOLID PATTERN

- Solid nests of cells without cystic or tubular spaces
- Cellular phelomorphism and mitotic activity
- Focal necrosis in the centre of tumor island may be observed







