

# **SALIVARY GLAND DISORDERS**

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# OBJECTIVES

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

# INTRODUCTION

## Salivary glands:

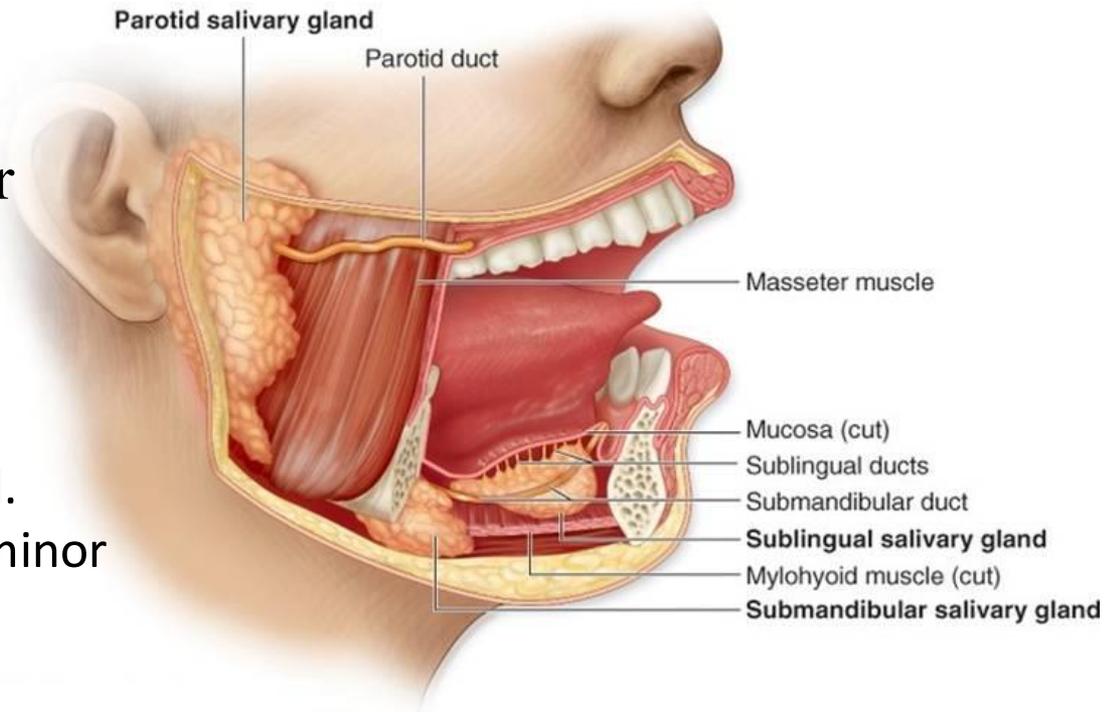
are composed of 4 major glands, in addition to minor glands.

### Major:

- 2 parotid glands.
- 2 submandibular glands.

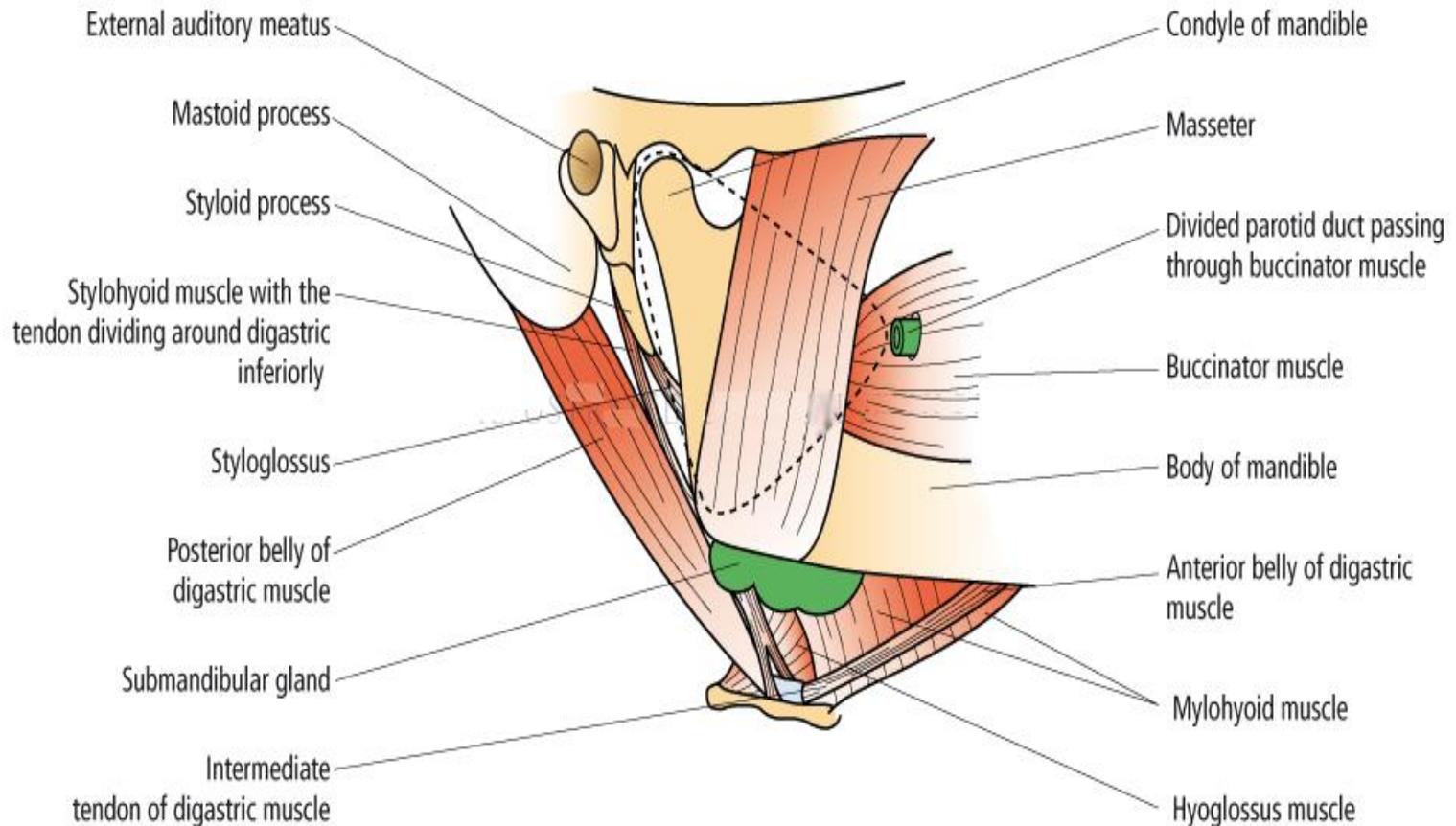
### Minor:

- Sublingual.
- Multiple minor glands.



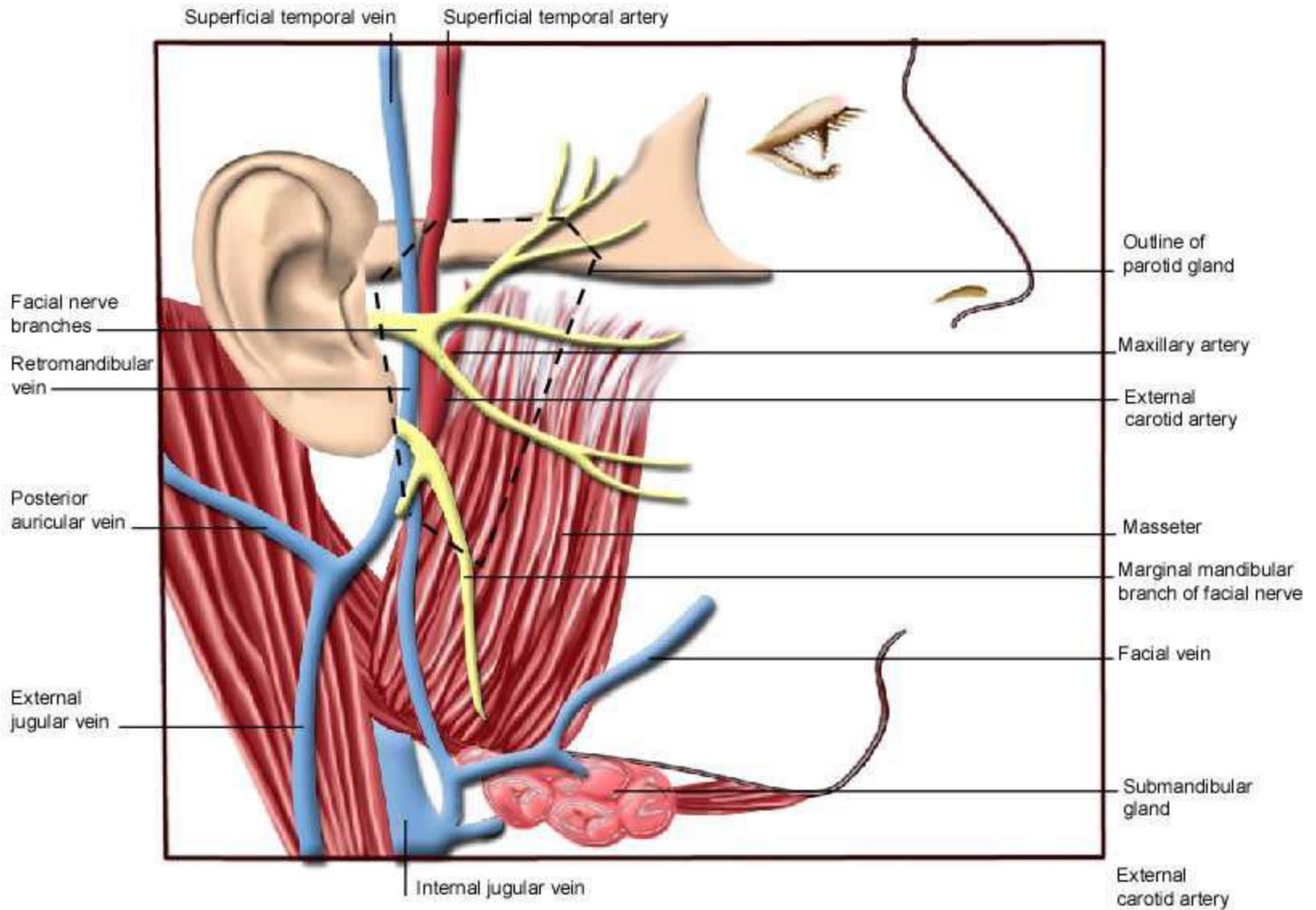
# ANATOMY

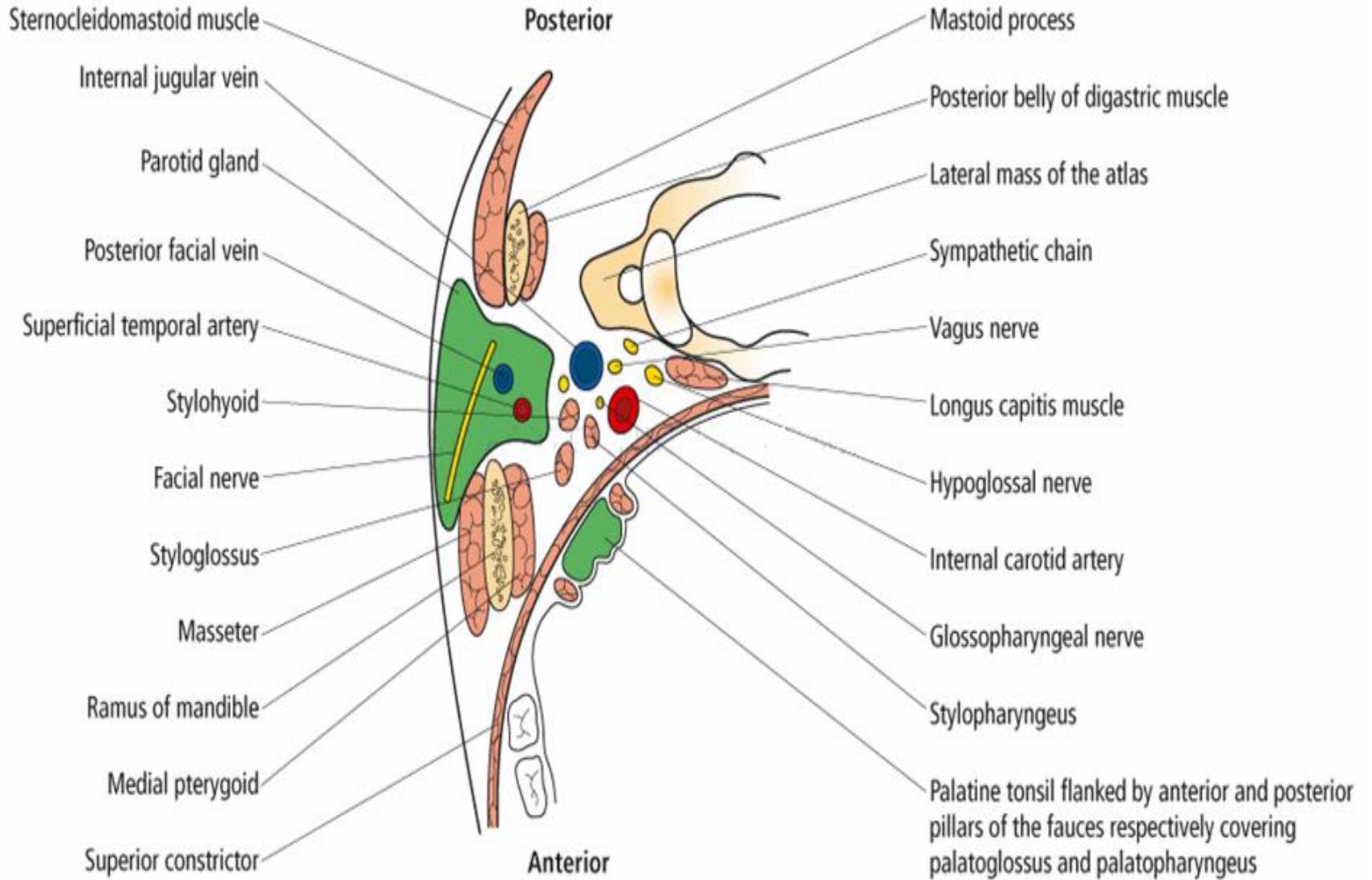
## 1. PAROTID GLAND



## Important structure that run through the parotid gland:

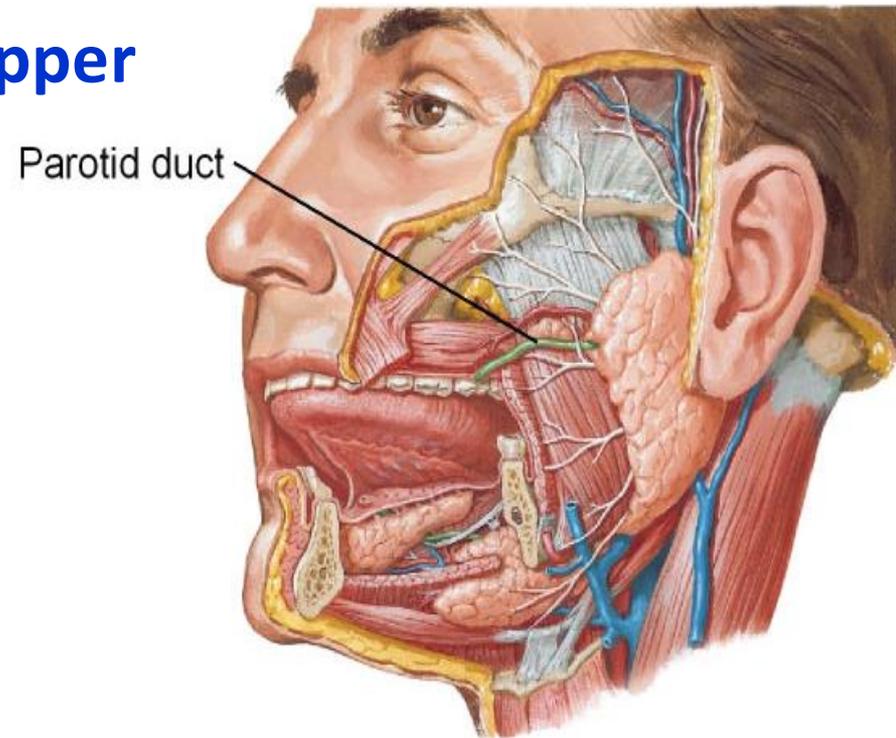
1. Branch of facial nerve.
2. Terminal branch of external carotid artery that divided into maxillary & superficial temporal artery.
3. The retromandibular vein ( post. Facial ).
4. Intraparotid lymph node.





## THE PAROTID DUCT:

- **Stensen's duct** is 5 cm long.
- open opposite the **second upper molar tooth**

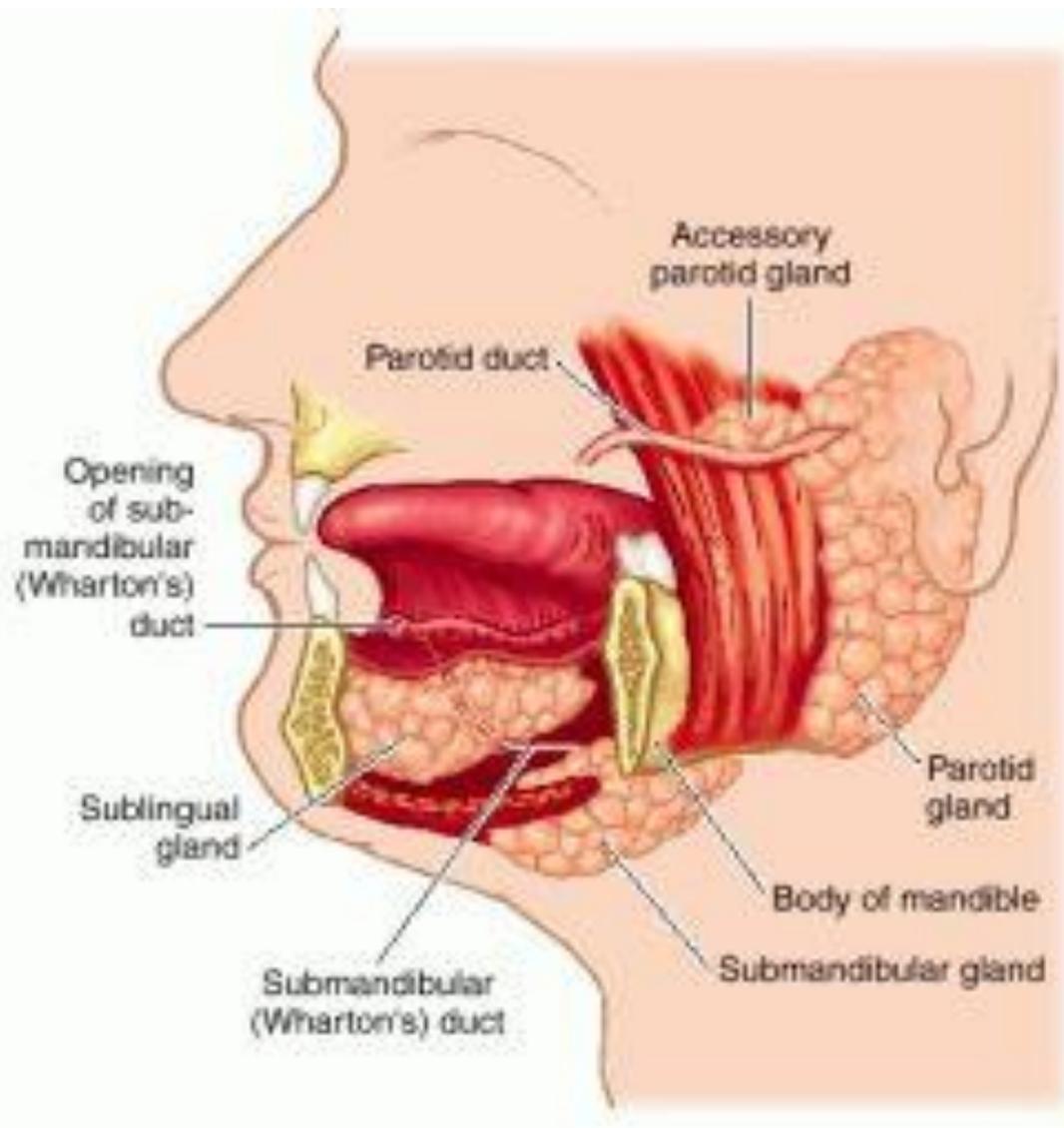


## 2. SUBMANDIBULAR GLAND

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

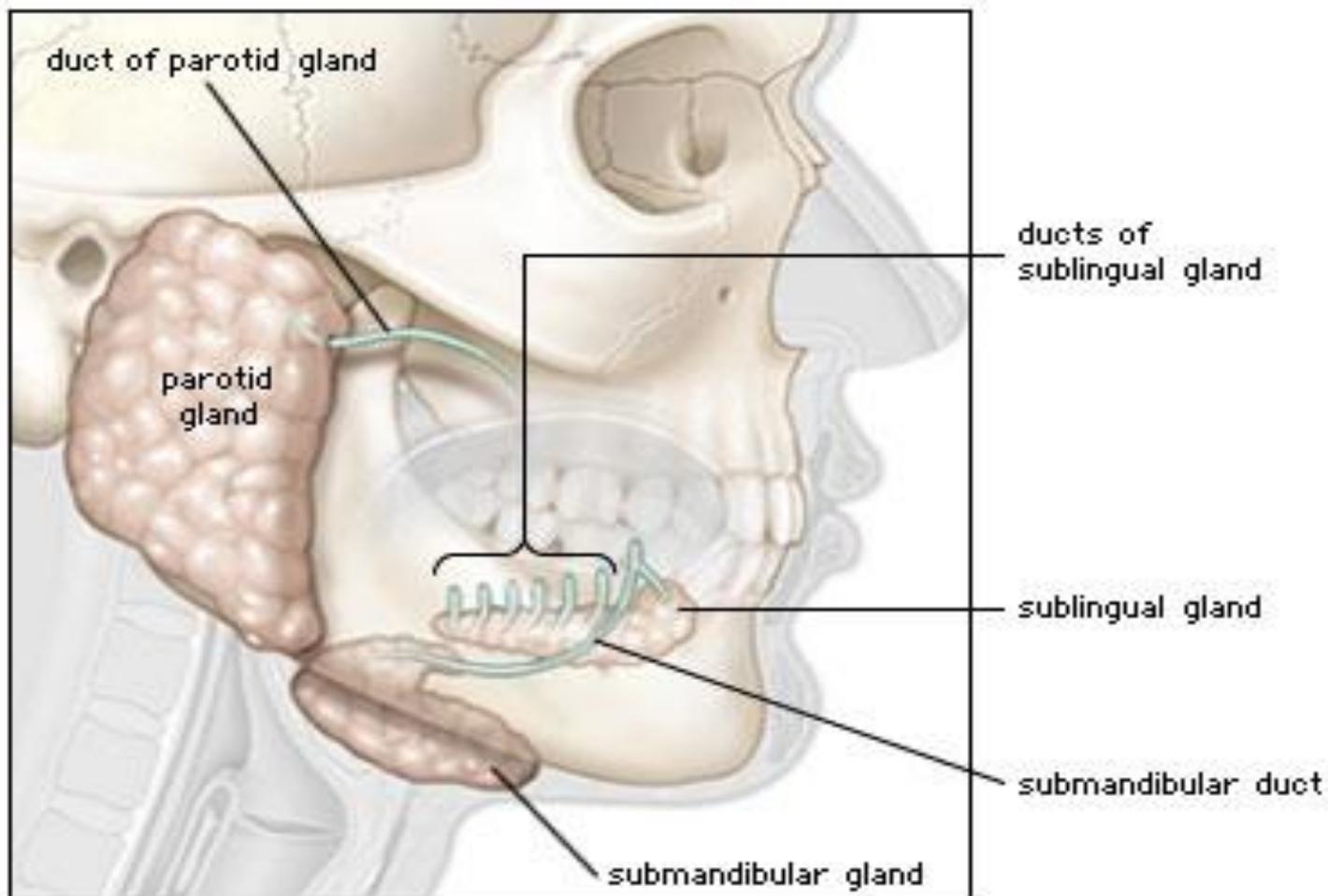
### Anatomical relationship:

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



### 3. 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.



## 4. MINOR SALIVARY GLAND

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

# DISORDERS OF MINOR & SUBLINGUAL SALIVARY GLAND

## CYST

### 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 sublingual & submandibular.
- The mucus collects around the gland & penetrates the mylohyoid diaphragm to enter the neck.

**Pt. presents with**

**Dumbbell shaped swelling , soft, fluctuant & painless**



# TUMORS

- Tumors of minor & sublingual salivary gland are extremely rare.
- 90% are malignant.
- Most common site: upper lip, palate & retromolar region.

# SUBMANDIBULAR GLAND



Figure 1

# 1- ECTOPIC ABERRANT SALIVARY GLAND TISSUE:

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



## 2- INFLAMMATORY DISEASES OF THE SUBMANDIBULAR GLAND:

sialadenitis



# ACUTE INFECTIONS:

viral

mumps

Other viral infections are extremely rare

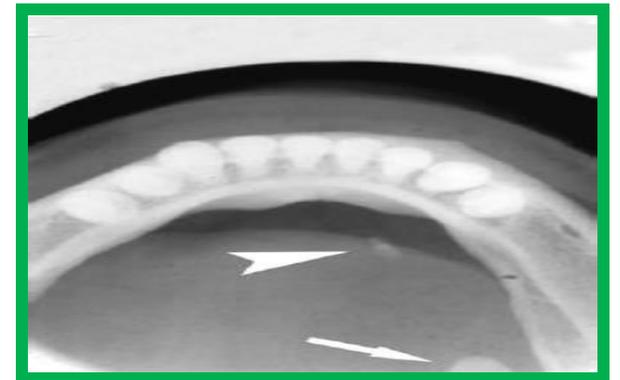
bacterial

Most commonly due to obstruction...

**Treatment:  
antibiotics and  
surgically**

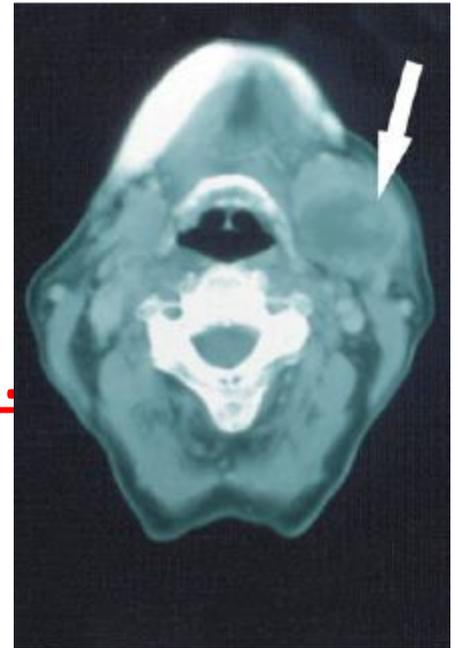
# 3-TRAUMA AND OBSTRUCTION:

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



# 4-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...



# PAROTID GLAND:



# 1-DEVELOPMENTAL

- They extremely rare like agenesis, , duct atresia and congenital fistula formation...

# 2-INFLAMMATORY DISORDERS

## A- viral infections:

Mumps...

Mode of infection

Prodromal period

Presentation

Diagnosis

Treatment is conservative

Complications: Orchitis, oophoritis, pancreatitis, sensorineural deafness, meningoencephalitis but they are rare...

## 2- INFLAMMATORY DISORDERS (CONT.)

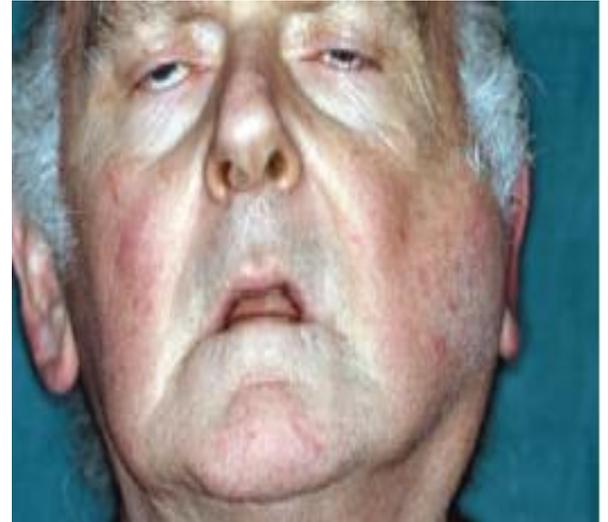
### B- bacterial:

Precipitating factors??!

Causative organisms

Presentation

Treatment :conservative and it might need 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..



## 2- 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...

treatment:

Surgery to improve the appearance  
although it's painless



# 3-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...**

## **4- TUMORS:**

- **The parotids are the commonest glands for tumors of salivary glands...**

Slowly painless growing tumor below the ear, or in front of it



Sometimes on the upper aspect of the neck:



# 4-TUMORS (CONT)

- If it arises from the accessory lobe it will look like a persistent 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)

Type	Sub-group	Common examples
I Adenoma	Pleomorphic Monomorphic	Pleomorphic adenoma Adenolymphoma (Warthin's tumour)
II Carcinoma	Low grade  High grade	Acinic cell carcinoma Adenoid cystic carcinoma Low-grade muco-epidermoid carcinoma 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  Cystic lesions	Benign lymphoepithelial lesion Adenomatoid hyperplasia Salivary gland cysts

# 4-TUMORS (CONT)

- Investigations:

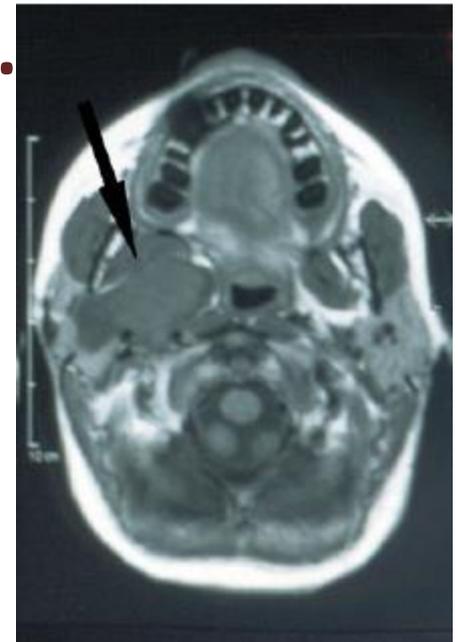
CT AND MRI

FNA

OPEN BIOPSY IS CONTRAINDICATED...

TREATMENT:

SURGICAL...



# OTHER RARE DISEASES:

## 1-granulomatous sialadenitis:

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

## 2- TUMOR LIKE DISEASES:

- They are a group of diseases that are hard to diagnose and are not under any group of the other diseases:
- Sialadenosis
- Adenomatoid hyperplasia
- Multifocal adenomorphous adenomatosis

# **3- DEGENERATIVE DISEASES:**

- **Sjogran's syndrome...:**
- **Benign lymphoepithelial lesions**
- **Xerostomia**
- **Sialorrhea**

# A- SJOGGRAN'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 ascending infection
- .females more than males 10:1
- Parotitis is more common

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Primary Sjögren's syndrome

More severe xerostomia

Widespread exocrine gland  
dysfunction

No connective tissue disorder

Secondary Sjögren's syndrome

M:F: 1:10

Middle age

Underlying connective tissue  
disorder

Benign lymphoepithelial lesion

20% develop lymphoma

Diffuse parotid swelling

20% bilateral

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# (CONT)

- The characteristic feature is progressive lymphocytic infiltration acinar cell destruction and proliferation of duct epithelium...

- Diagnosis based on history...

- Treatment remains symptomatic:

Artificial tears...

Salivary substitiuants or water...

Floride to avoid dental carries...

**Complications are B cell lymphoma**

# B-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

# C-SIALORRHEA:

- Causes: 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 submandibular gland excision...

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

# HOW TO APPROACH THE PATIENT CLINICALLY

- 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?

# CLINICAL EX.

## INSPECTION:

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

# CLINICAL EX.

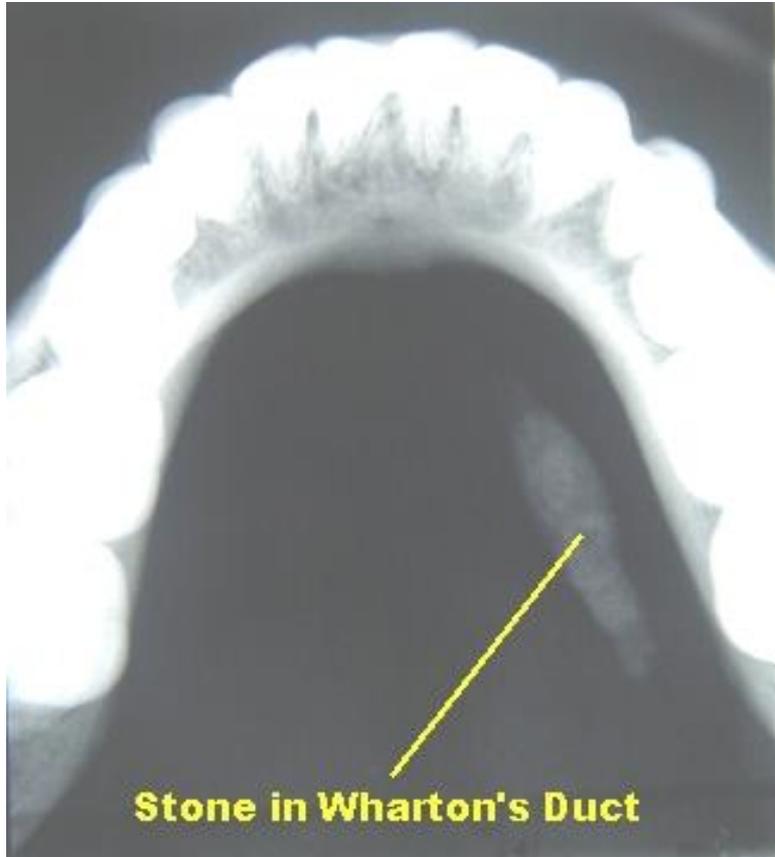
## PALPATION:

- 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 Sialendoscopy<sup>2</sup>

# 1. PLAIN OCCLUSAL FILM



- Effective for intraductal stones, while....
- intraglandular, radiolucent or small stones may be missed.

## **2. CT-SCAN**

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

## **3. ULTRASOUND**

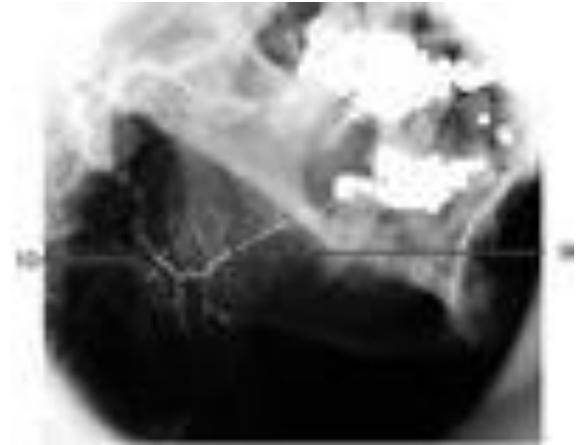
- Operator dependent, can detect small stones (>2mm), inexpensive, non-invasive

## 4. SIALOGRAPHY

- 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

## 4. SIALAOGRAPHY, CONT

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

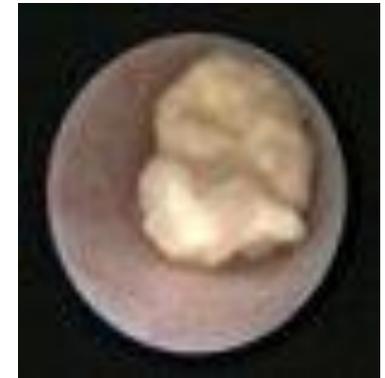


## 5. RADIONUCLIDE STUDY

- is useful preoperatively to determine if gland  
is functional.

## 6.SIALENDOSCOPY

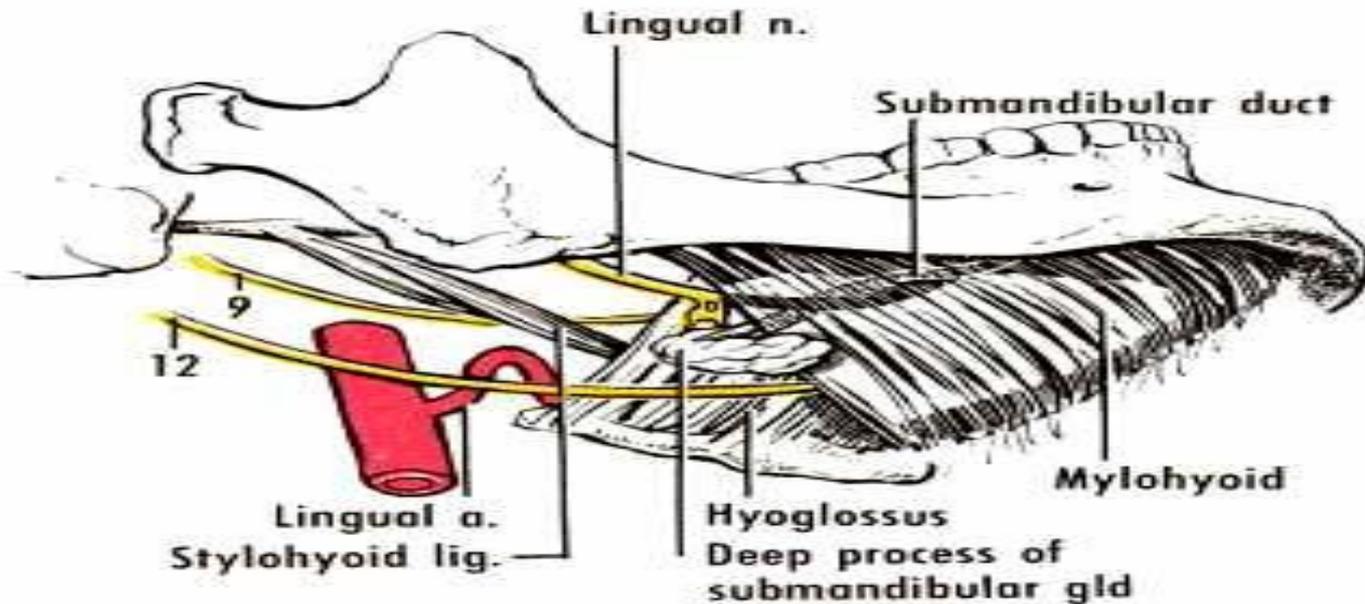
- Allows complete exploration of the ductal system, direct visualization of duct pathology
- Success rate of >95%<sup>2</sup>
- Disadvantage: technically challenging, trauma could result in stenosis, perforation



# SURGICAL APPROACHES TO SALIVARY GLANDS:

## A-stone removal:

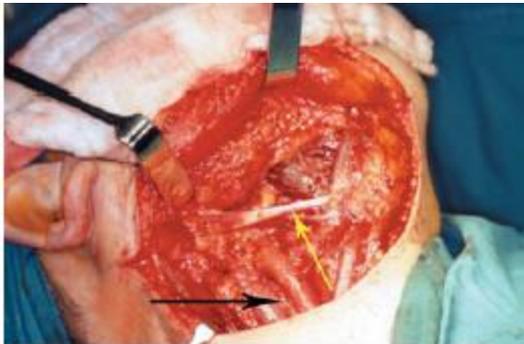
-submandibular gland



# B- TUMOR EXCISION:

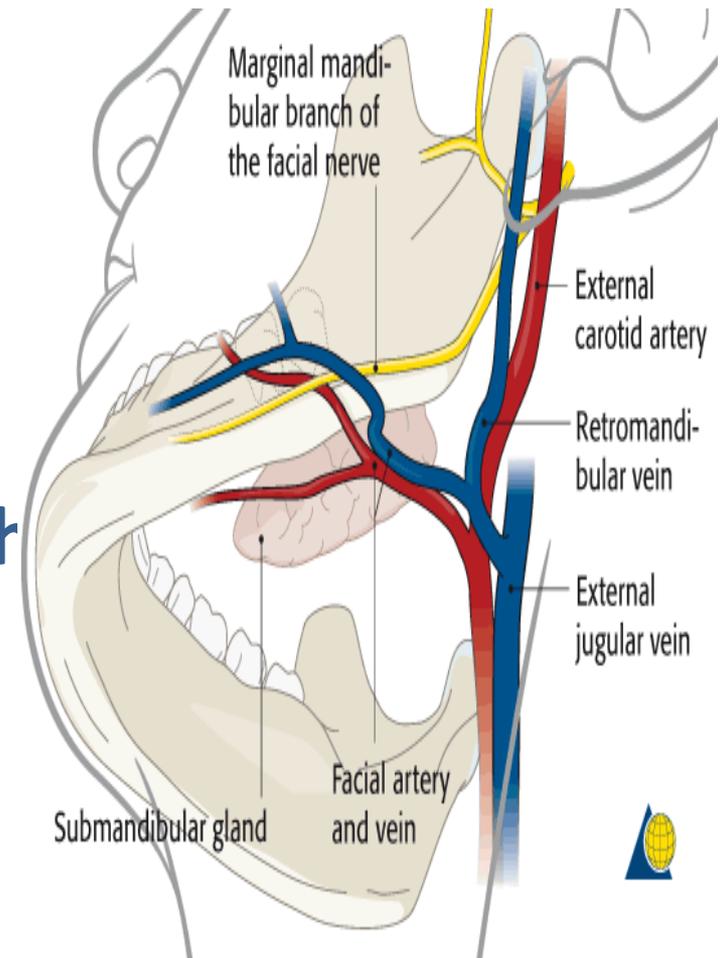
## 1-SUBMANDIBULAR GLAND

-intracapsular dissection      -extracapsular  
dissection...(suprehyoid 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 injury
- hypoglossal nerve injury
- transection of the nerve to the mylohyoid muscle causing submental skin anesthesia...

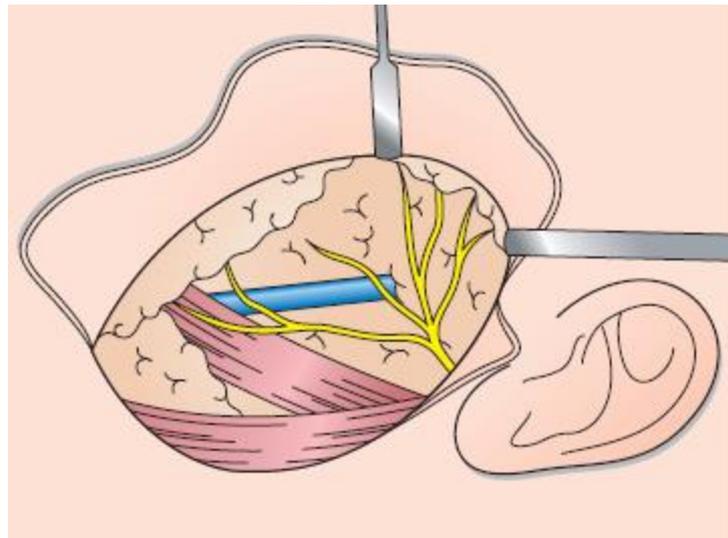
# B-PAROTID GLAND:

- **Superficial parotidectomy:**
- 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 removed
- Facial nerve is transected
- Masseter muscle removed
- Neck dissection



# COMPLICATIONS:

- Hematoma
- Infection
- Temporary facial nerve weakness.
- Transection of the facial nerve and permanent facial weakness..
- Sialocele...
- Facial numbness.
- Permanent numbness 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

# references

- Baily and love's
- Schwart's
- Browse
- Manual of clinical syrgery...