

REACTIVE SALIVARY GLAND DISEASES



**Mucocele
Mucus Retention Cyst
Sialolithiasis
Necrotizing sialometaplasia**

Sunday Dec 21ST 2019

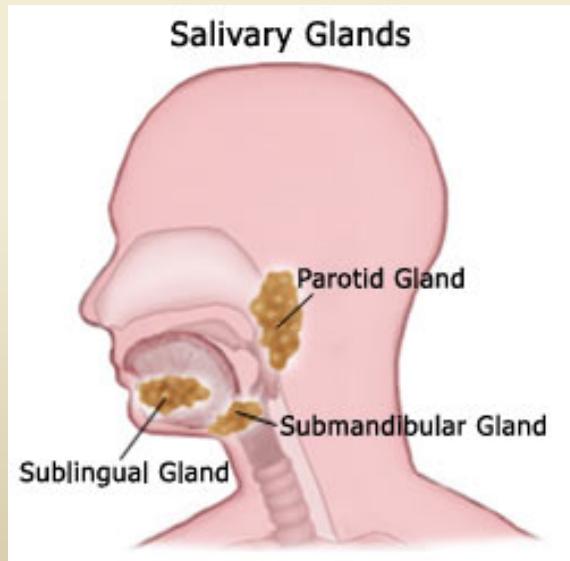


- Objectives:
 - Recognize the clinical types of SG reactive lesions
 - How these lesions develop
 - Diagnostic procedures used

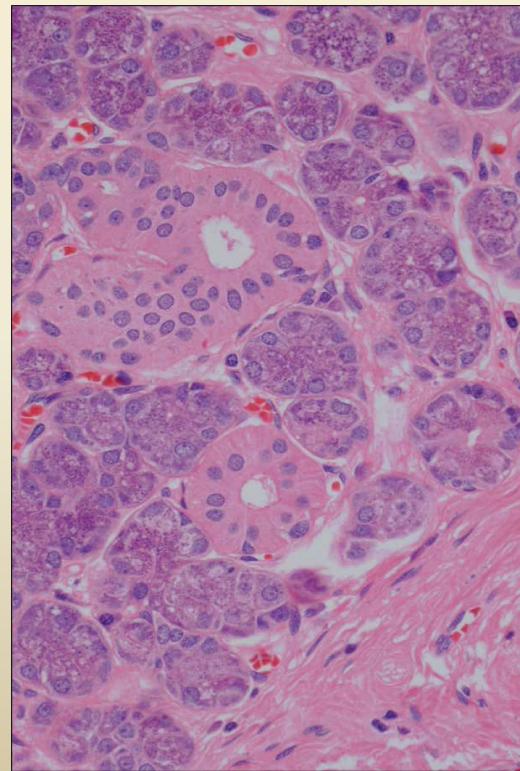
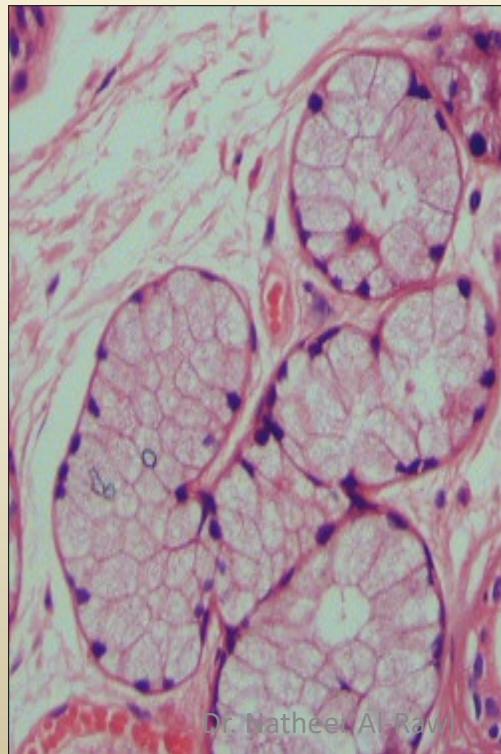
Distribution & Relative Composition of Salivary Glands

Major Paired Glands

- Parotid - Serous. 75%
- Submandibular - Mixed M-S. 18%
- Sublingual - Mixed M-S. 7%



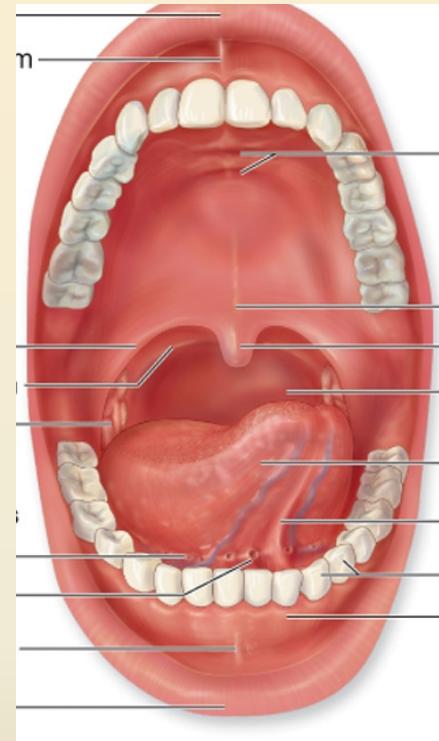
Reactive SG lesions



Distribution & Relative Composition of Salivary Glands

Minor Glands

- Oral mucosa (tongue, palates, lips, buccal mucosa)
- Pharynx & tonsillar area
- Larynx, trachea, major bronchi
- Nasopharynx, nasal cavity and paranasal sinuses
- Minor salivary glands are predominantly mucous secreting



Ectopic Gland Tissue

- May be found in the superficial neck, within lymph nodes close to or in the parotid glands,
- In the lingual deep floor of mouth area (**Stafne's bone cyst**) and within the jaw bone.



Mucocele

(*Muco*: mucus , *coele*: cavity)

Clinical term that includes mucus extravasation phenomenon and mucus retention cyst.

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



Ranula

Clinical mucus **extravasation phenomenon and mucus retention cyst** that occurs specifically in the floor of the mouth



Mucocele

(*Muco*: mucus , *coele*: cavity)

It is a tissue swelling composed of **pooled mucus** that escapes into the connective tissue from severed excretory ducts.

When salivary duct is **severed** the acinar cells will continue to secrete saliva into the severed duct.

At the site of the cut/severance the **secretory product escape into the connective tissue** forming a pool of mucus that distends the surrounding tissue.

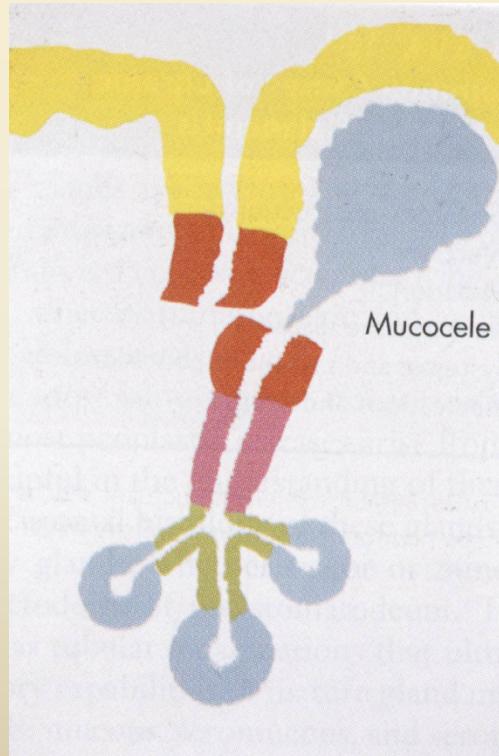
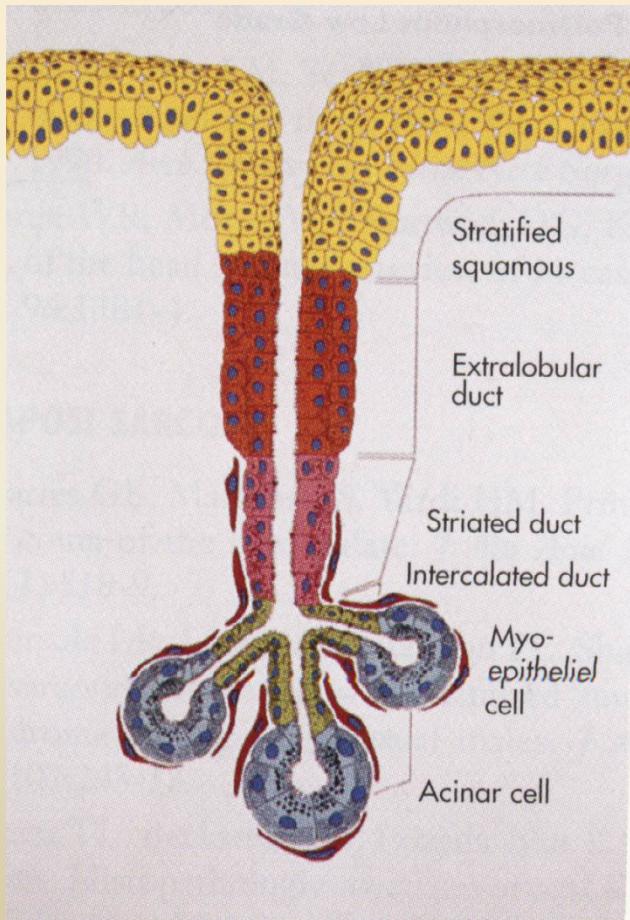


Mucous extravasation phenomenon

TRAUMA



SEVERANCE OF SALIVARY GLAND EXCRETORY DUCT



MUCOUS ESCAPE (OR EXTRAVASATION)



INFLAMMATORY REACTION IN THE CONNECTIVE TISSUE

Mucous extravasation phenomenon

CLINICAL FEATURES



Most common site – lower lip

Painless, smooth surface , fluctuant swelling

Initially the mucocels are **well circumscribed** but with repeated trauma they become **nodular** ,more **diffuse** and firm on palpation.

Usually ranging in size from a few millimetres to 2cm in diameter

Bluish colouration

Younger patients

SUPERFICIAL MUCOCELE –

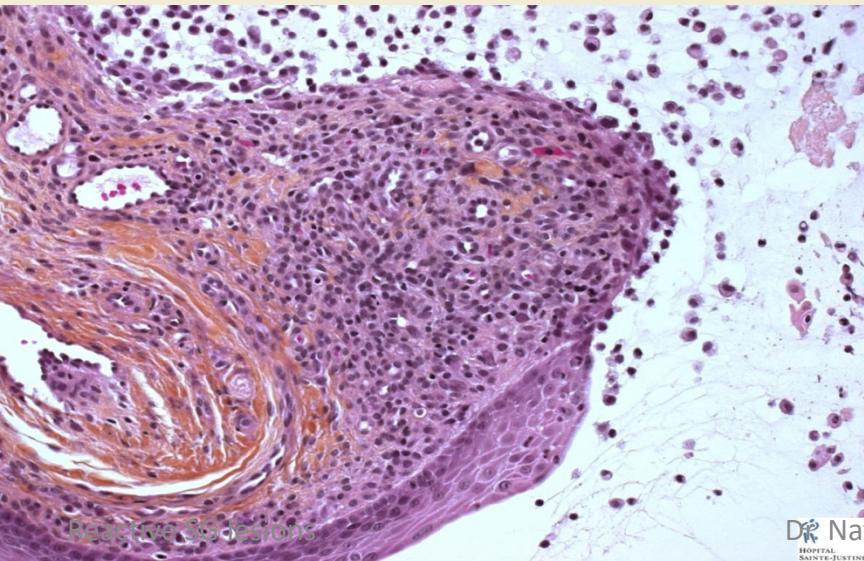
Reactive SG lesions

OCCUR MOST COMMONLY IN THE RETROMOLAR AREA, SOFT PALATE AND POSTERIOR BUCCAL MUCOSA

Dr. Nafees Al-Rayi

Mucous extravasation phenomenon

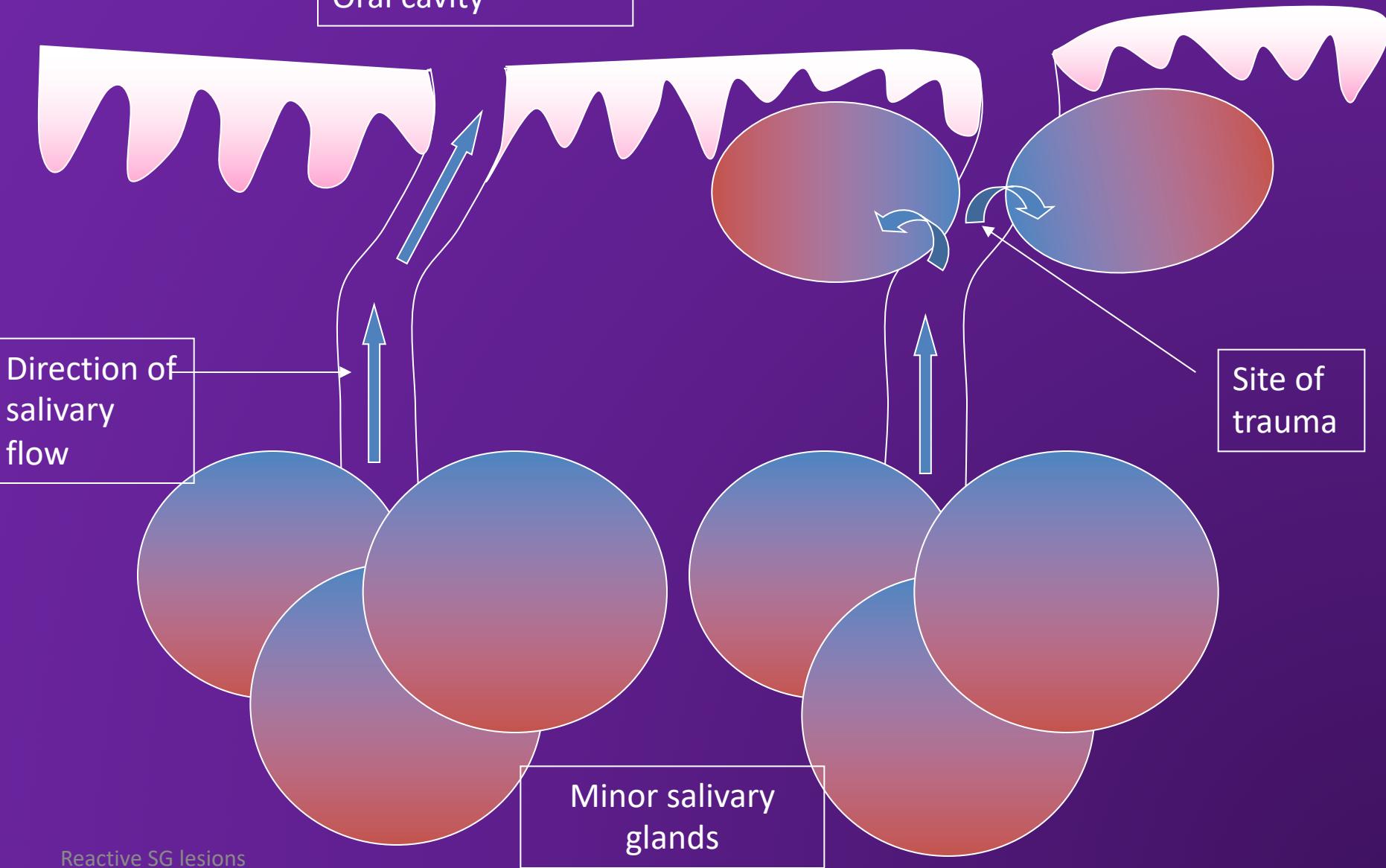
HISTOPATHOLOGY



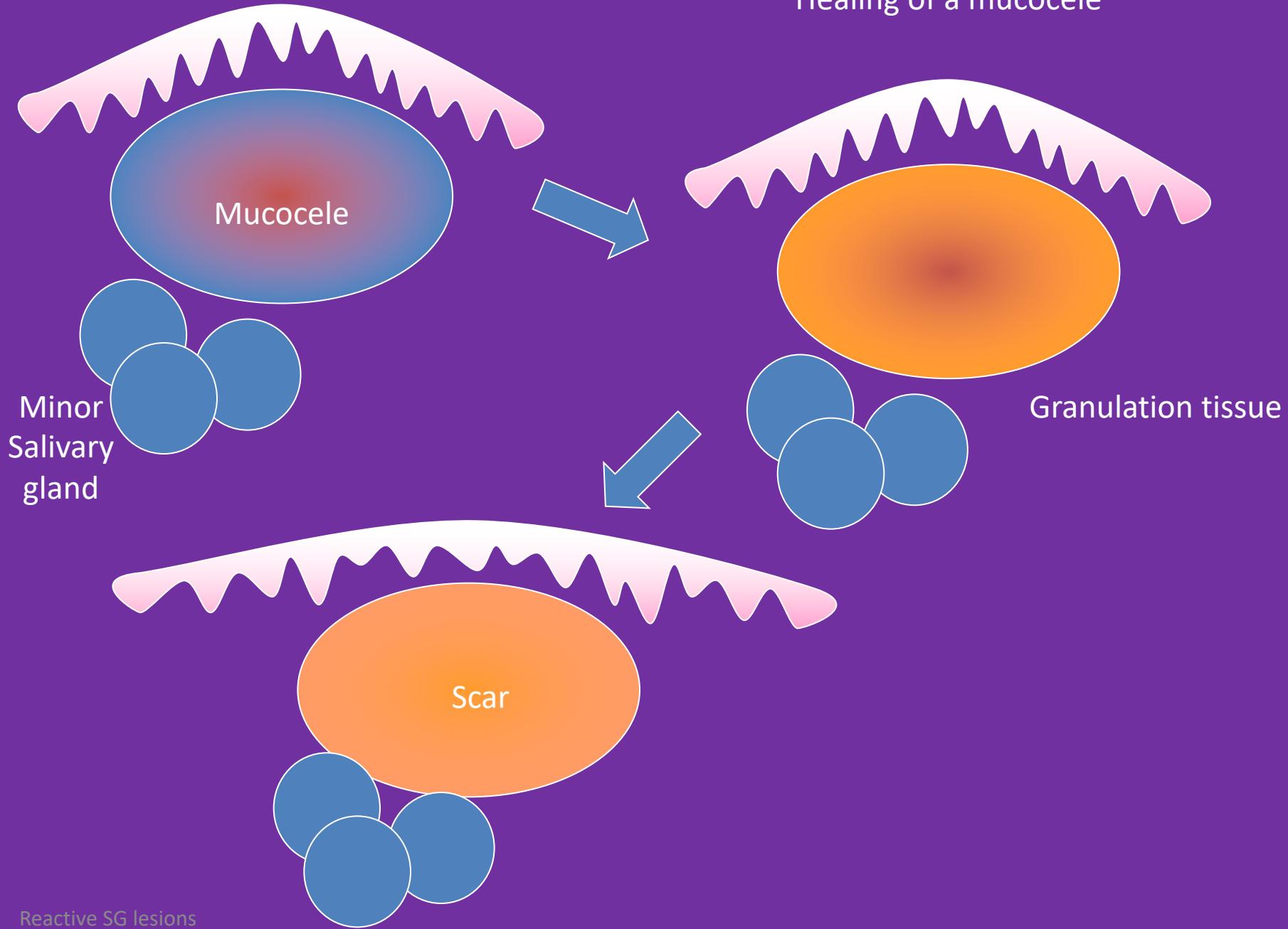
Reactive SG regions

- Free mucin in connective tissue
 - The mucinous material **basophilic** or **acidophilic** and contains **neutrophils** and large oval **foam cells** the **histiocytes** .
- Inflammatory response
- Connective tissue repair
- Scarring
- An epithelial lining is lacking
- The base of the mucocele will reveal feeder duct.
- Salivary gland changes (**in long standing case**) shows:
 - Ductal dilation
 - Chronic inflammation
 - Acinar degeneration
 - Increased fibrosis

Oral cavity



Healing of a mucocele



Mucocele

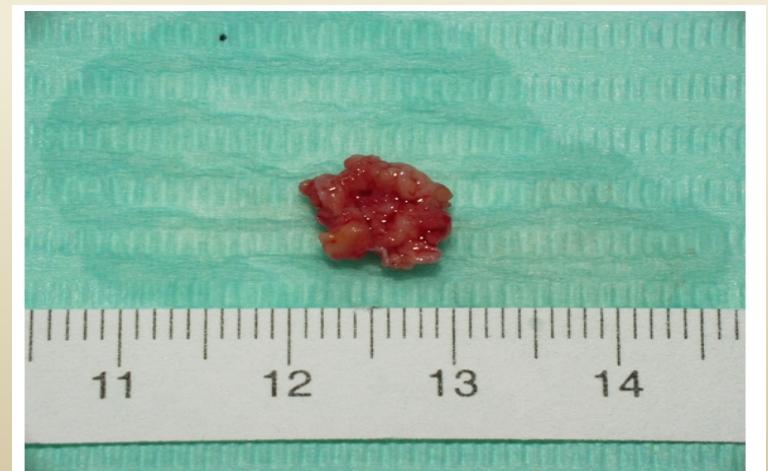
DIFFERENTIAL DIAGNOSIS

- **Mucoepidermoid carcinoma**
- **Cavernous hemangioma** (when there is hemorrhage)
- Blisters seen in some **bullos** and desquamative disease.
- **Soft tissue neoplasms (neurofibroma & lipoma)**

Mucocele

TREATMENT:

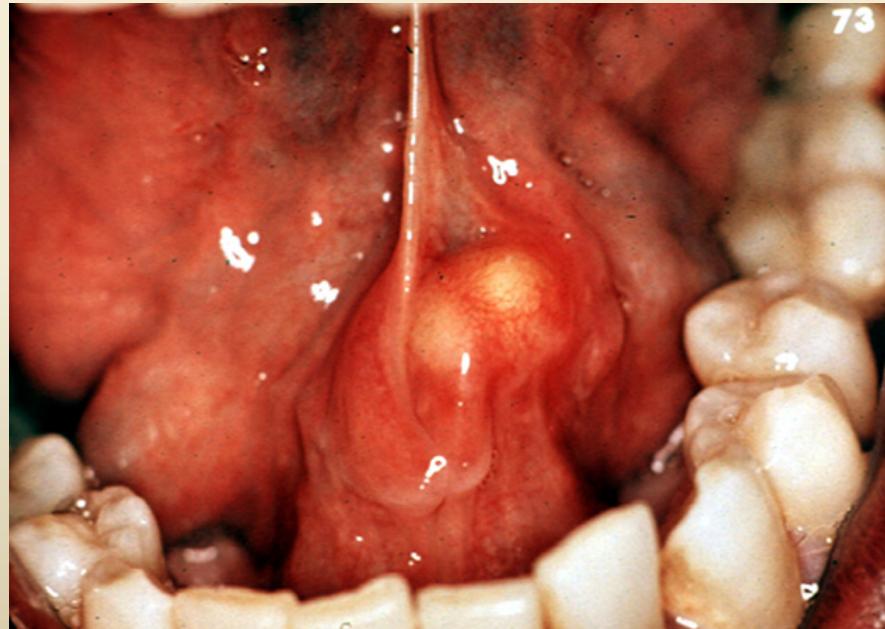
- Minor salivary gland mucocele will not resolve on its own
it must be surgically excised.
- To minimize the chances of recurrence **the feeder gland should also be removed.**
- Post surgical **paresthesia** might occur when the branches of the mental nerve are severed

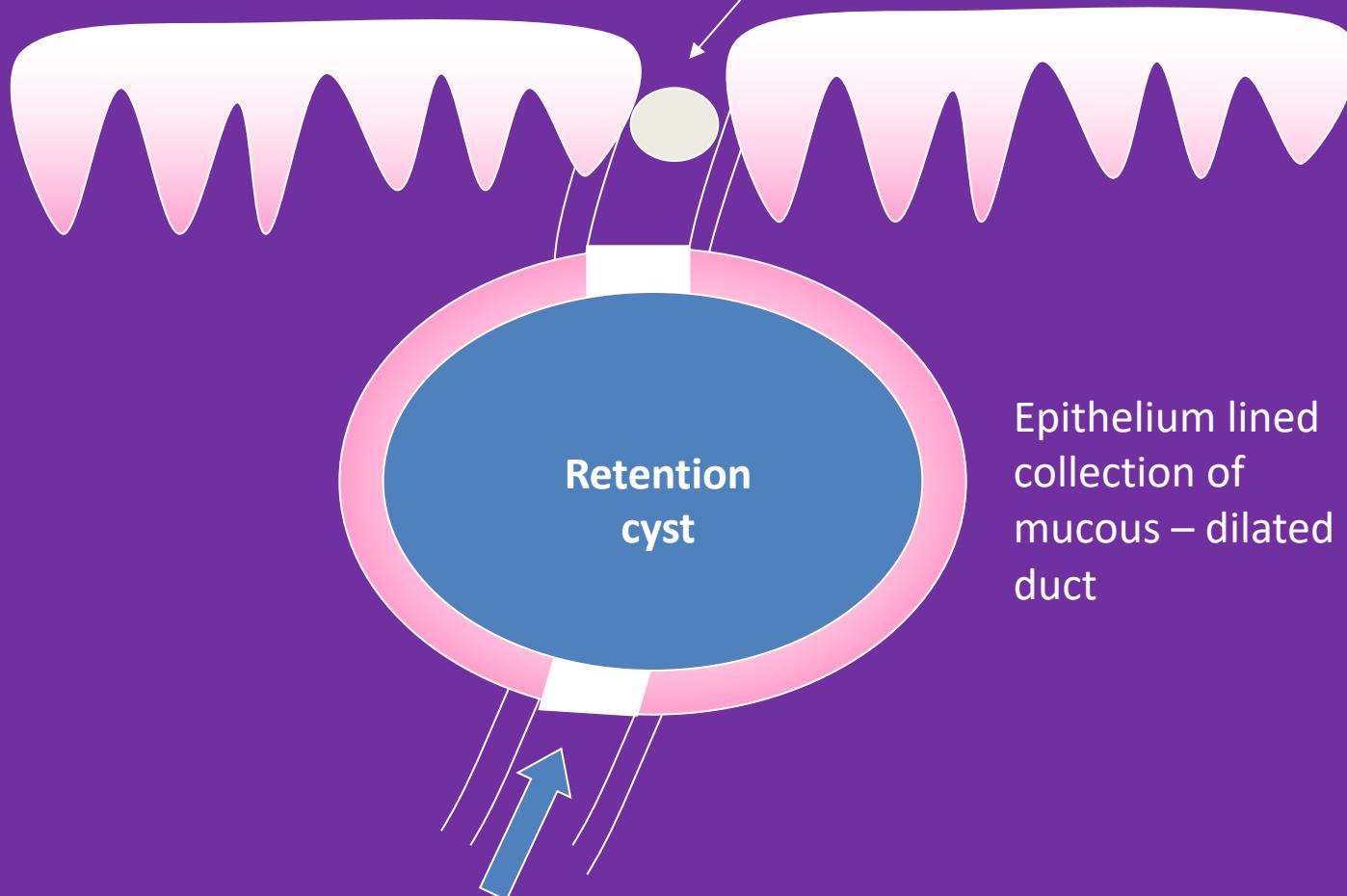


Mucus retention cyst

(Obstructive Sialadenitis)

- It is a swelling caused by an **obstruction** of a salivary gland **excretory duct** resulting in an **epithelial lining cavity** containing mucus.

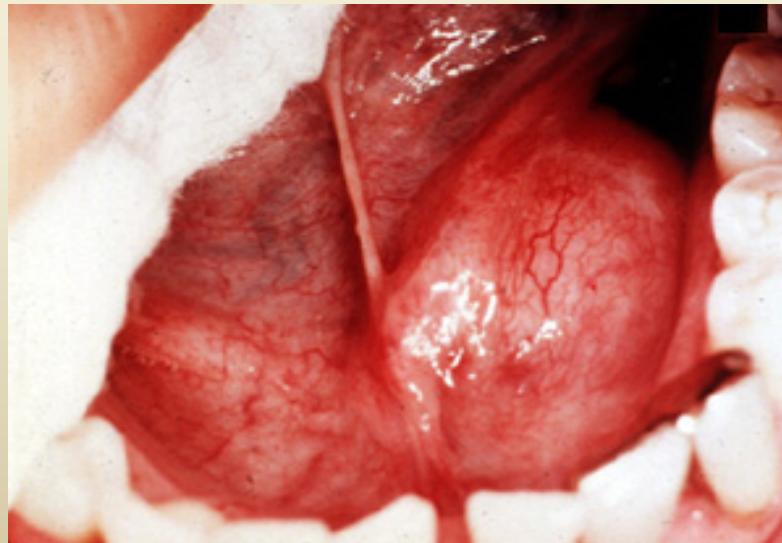




Epithelium lined
collection of
mucous – dilated
duct

Mucus retention cyst

- The mucus retention cyst is lined by epithelium could **occur in the major salivary gland**, when they do occur they are **multiple** i.e. **poly cystic disease of the parotid gland**



Mucous retention cyst

OBSTRUCTION OF
DUCT



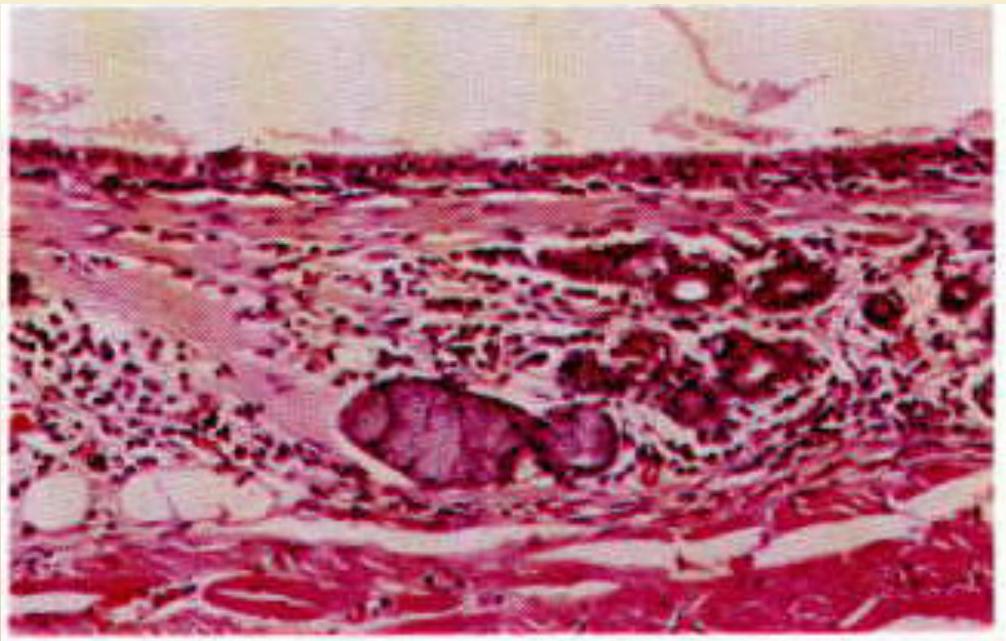
RETENTION OF MUCOUS



DILATION OF DUCT



DEVELOPMENT OF A
EPITHELIAL LINED CYSTIC
LESION



Mucous retention cyst

CLINICAL FEATURES



Less common than extravasation mucoceles

Occurs in **older patients**

Seen in **floor of mouth**, upper lip, palate, cheek,

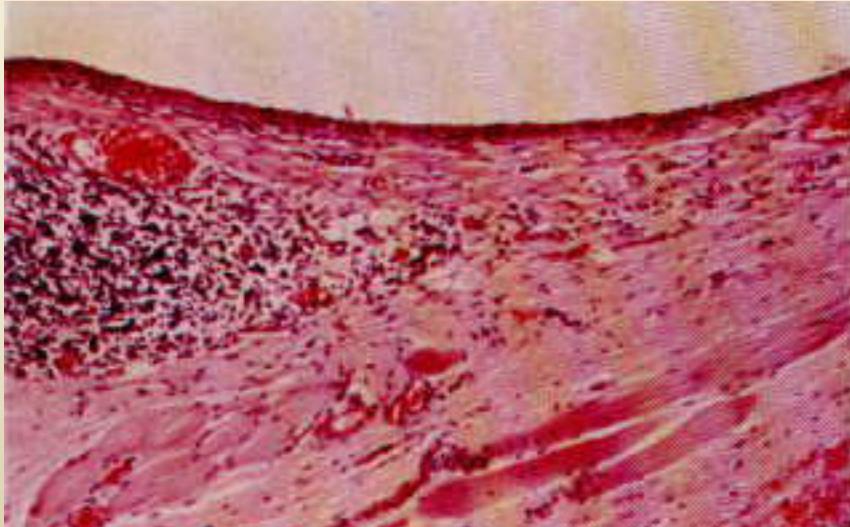
Painless, smooth surface **fluctuant , swelling**

Usually **ranging in size** from a few millimetres to 2cm in diameter

Overlying **mucosa is intact** and normal colour

Mucous retention cyst

HISTOPATHOLOGY



- Cystic cavity lined by compressed ductal epithelium.
- The epithelium of the cyst is stratified cuboidal or columnar duct like epithelium.
- Cyst lumen contains mucin or occasionally a sialolith
- Connective tissue shows minimal inflammation
- Salivary gland changes
 - Ductal dilation
 - Chronic inflammation
 - Acinar degeneration
 - Increased fibrosis

Differential Diagnosis:

- Salivary gland **neoplasm**
- **Mucus extravasation** phenomenon
- Benign **CT neoplasm**
- **Dermoid** cyst

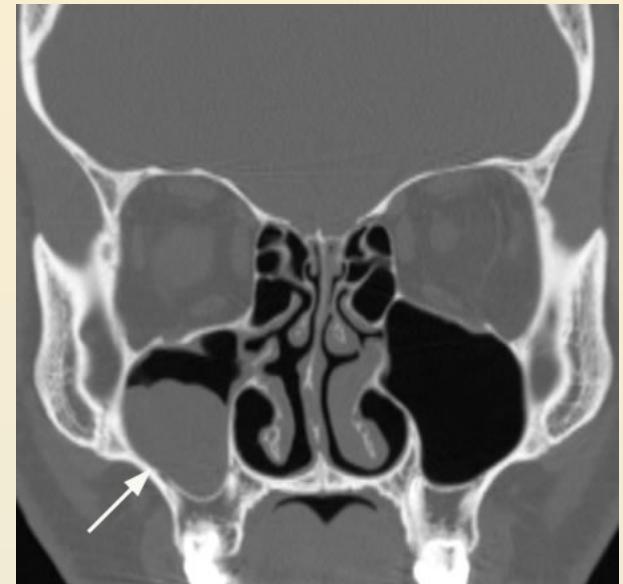
Mucus retention cyst

TREATMENT:

- Simple **excision** is the treatment of choice with **caution of rupturing the cystic sacs**.
- Recurrence is **rare**.
- However **damage** to the adjacent gland may result in a **mucocele** formation.

Maxillary Retention cyst

- Involve **lining** of maxillary antrum
- Due to **blockage of antral sero-mucus gland** - → ductal epith. Lined cystic structure filled with mucin.
- **Inflammatory** condition related to **allergy or infection** (leak of proteins into surrounding ST → **increase osmotic pressure** with subsequent **fluid increase**.
- **Asymptomatic**, appear as **hemispheric, homogenous well-defined radiopacity**



Histopathology:

For retention cysts :

Lining: Pseudostratified squamous epith. With occasional mucus cells with minimal infl.

For pseudocysts:

No evidence of epith. Lining, just mucoid material surrounded by slightly compressed CT

Differential Diagnosis:

- Antral **polyp**
 - Sinusitis
 - Antral neoplasms

Treatment:

None, with periodic observation



Dr. Natheer Al-Rawi

Salivary gland obstruction

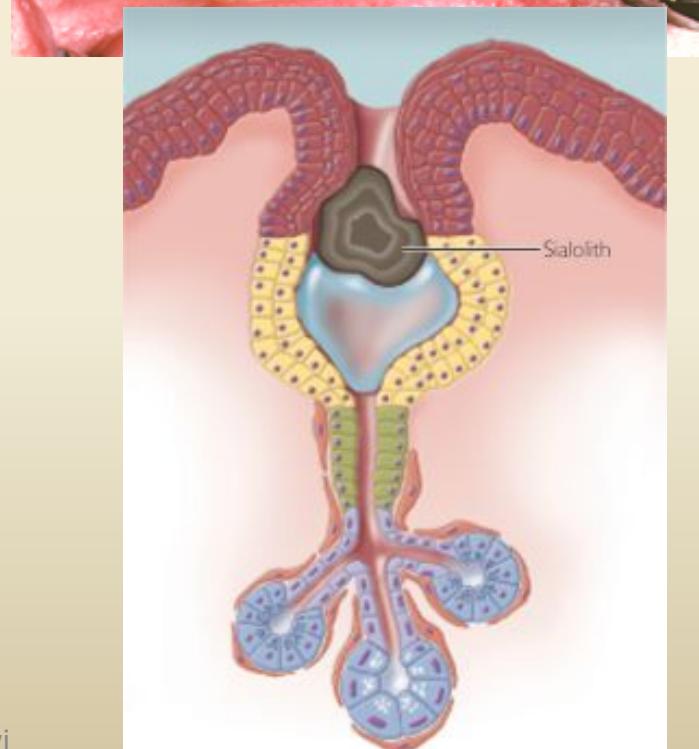
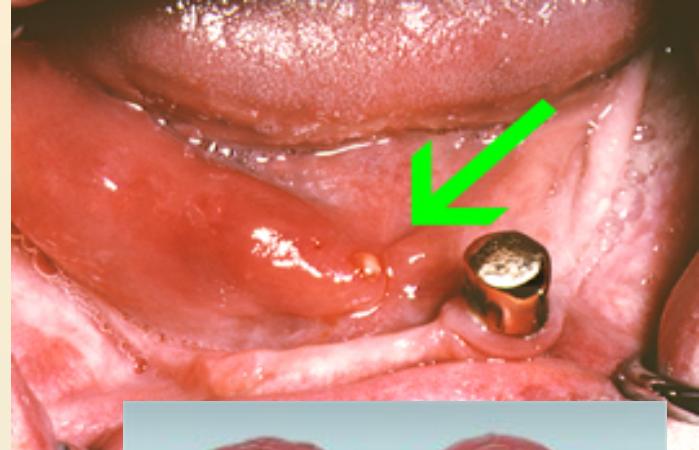
- Sialolith
- Periductal scarring
- Impinging tumor



Effects of obstruction are restriction of salivary flow leading to intermittent swelling and pain of involved gland often at meal time and in the long term chronic sialadenitis

Sialoliths

- **Salivary stone**
- Usually associated with the submandibular gland – **Wharton's duct**
- Found **anywhere** within the ductal system
- **Precipitation of calcium salts**



Clinical features

- History of **intermittent swelling and pain often at meal times**
- **Consequences**
 - **chronic sialadenitis, fibrosis of gland and possibly a mucous retention cyst**

Management

- **Surgical removal of stone with/without gland**

Sialolithiasis

HOW THE STONE IS FORMED:

It is assumed that mucin proteins and desquamated ductal epithelial cells form a small nidus on which the calcium salts are precipitated, this nidus then allows concentric lamellar crystallizations to occur and thus sialolith increases in size as a layer by layer gets deposited on it.

- Water hardness ↑likelihood? ...Maybe....
- Xerostomic medications
- Tobacco smoking, positive correlation
- Smoking has an increased cytotoxic effect on saliva, decreases PMN phagocytic ability and reduces salivary proteins.
- Gout is the only systemic disease known to cause salivary calculi and these are composed of uric acid.

Sialoliths (stone composition)

- **Organic**; often predominate in the center
 - Glycoproteins
 - Mucopolysaccarides
 - Bacteria!
 - Cellular debris
- **Inorganic**; often in the periphery
 - Calcium carbonates & calcium phosphates in the form of hydroxyapatite



Reasons sialolithiasis may occur more often in the SMG

- Saliva more **alkaline**
- **Higher** concentration of **calcium** and **phosphate** in the saliva
- **Higher mucus** content
- **Longer duct**
- **Anti-gravity flow**

Other characteristics

- Despite a similar chemical make-up,
80-90% of SMG calculi are radio-opaque
50-80% of parotid calculi are radiolucent
- **30% of SMG stones are multiple**
60% of Parotid stones are multiple

Diagnostics:

1. Plain occlusal film



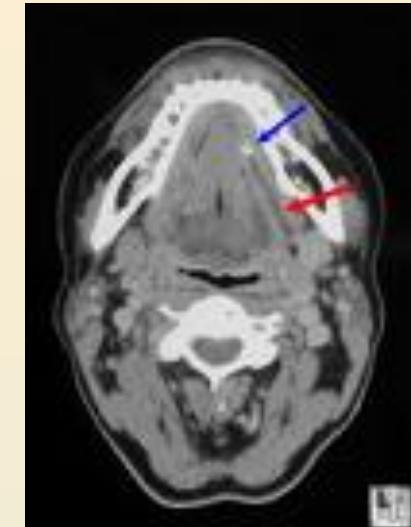
- Effective for **intraductal stones**, while....
- **intraglandular**, radiolucent or small stones may be missed.



Diagnostic approaches

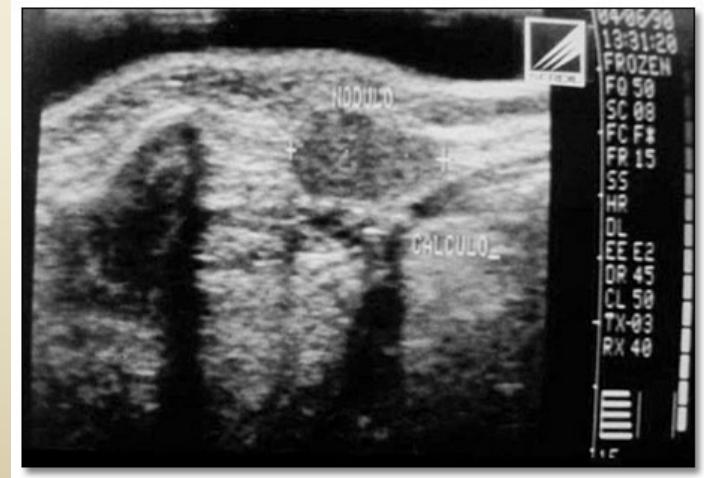
2. CT Scan:

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



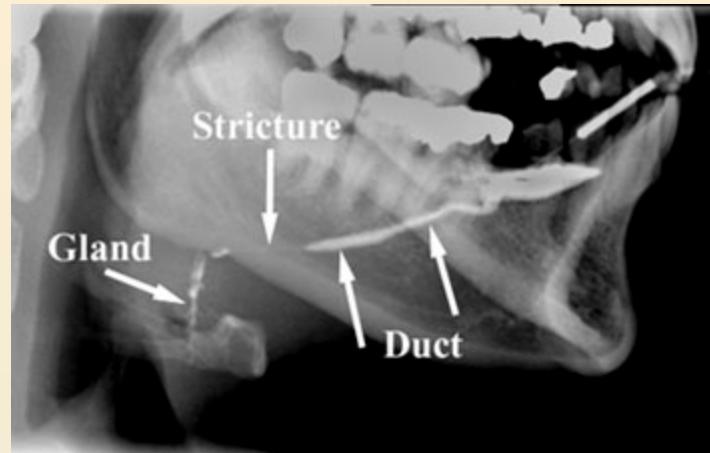
3. Ultrasound:

- 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



Sialography continued...

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

Sialography descriptive terminology

Sausage link	Sialodochitis
Dots & blobs	Sialoadenitis
Tree in winter	Normal PG
Bush in winter	Normal SMG
Snow storm appearance	Sjogren



Reactive SG lesions



Dr. Natheer Al-Rawi

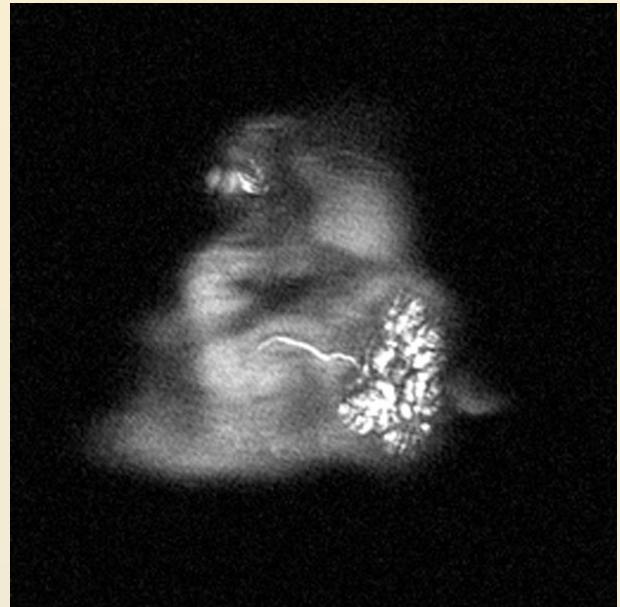


5. Radionuclide Studies

- Useful to image the **parenchyma**
- **T99** is an artificial radioactive element (atomic #43, atomic weight 99) that is used as a **tracer** in imaging studies.
- T99 is a **radioisotope** that decays and emits a gamma ray. Half life of **6 hours**.

6.MR Sialography

- **T2 weighted fast spin echo** slides in **sagittal** and **axial planes**.
Volumetric reconstruction allows visualization of ducts
- **ADV:** No dye, no irradiation, no pain
- **DIS:** Cost, possible artifact



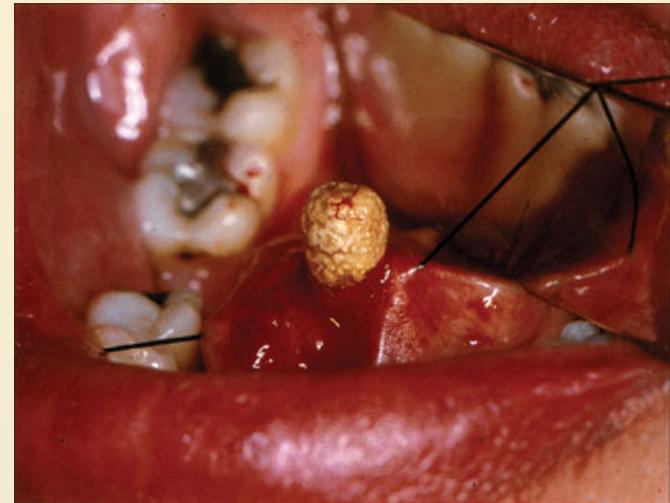
7. Diagnostic Sialendoscopy

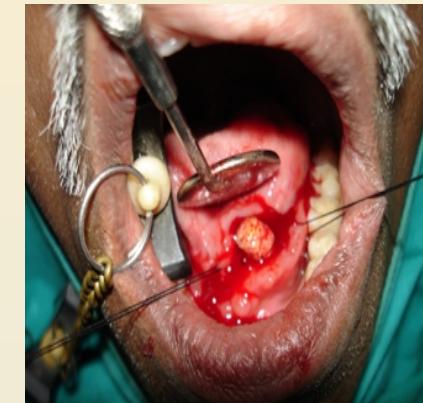
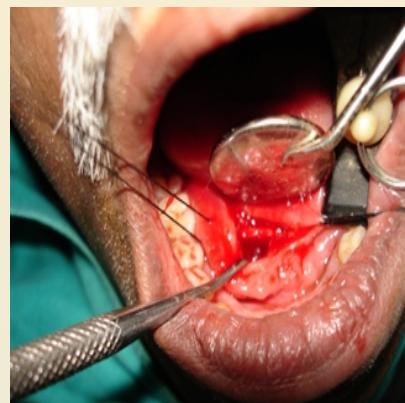
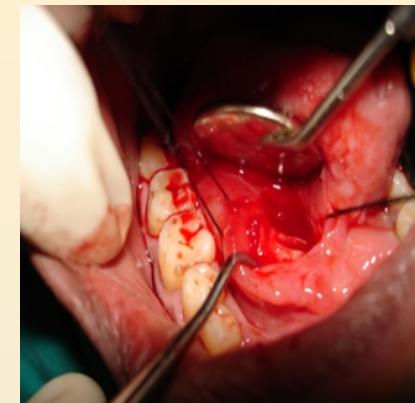
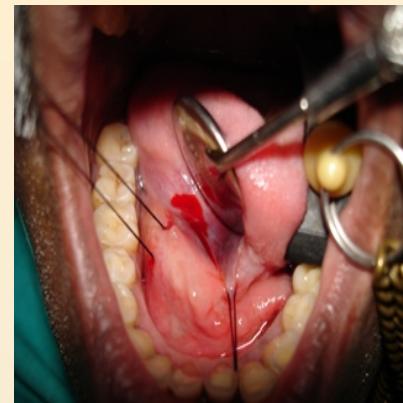
- Allows **complete exploration** of the ductal system, direct visualization of duct pathology
- Success rate of **>95%**
- **Disadvantage:** technically challenging, trauma could result in **stenosis, perforation**



Sialolithiasis Treatment

- **None:** antibiotics and anti-inflammatories, hoping for spontaneous stone passage.
- **Stone excision:**
 - Lithotripsy
 - Interventional sialendoscopy
 - Simple removal (20% recurrence)
- **Gland excision**





Dr. Amer Al-Rawi

- **External lithotripsy**
 - Stones are fragmented and expected to pass spontaneously
 - The remaining stone may be the ideal **nidus for recurrence**
- **Interventional Sialendoscopy**
 - Can retrieve stones, may also use laser to fragment stones and retrieve.



Transoral vs. Extraoral Removal

- Some say:
 - if a stone can be palpated through the mouth, it can be removed **trans-orally** (TO)
 - Or if it can be visualized on a true central occlusal radiograph, it can be removed TO.
 - Finally, if it is no further than 2cm from the punctum, it can be removed TO.



Posterior Stones

- Deeper submandibular stones (~15-20% of stones) may best be removed via **sialadenectomy**.
- Some surgeons say can still remove transorally, but should be done via **GA**.
- Floor of mouth (FOM) opened opposite the first premolar, duct dissected out, lingual nerve identified.
- **Duct opened & stone removed, FOM approximated.**

Submandibular Sialoliths: Transoral Advantages

- Preserves a functional gland
- Avoids neck scar
- Possibly less time from work
- No overnight stay in hospital
- Avoids risk to CN 7 & 12

Gland excision indicated

- Very posterior stones
- Intra-glandular stones
- Significantly symptomatic patients
- Failed transoral approach



Sialolithiasis

HISTOPATHOLOGY:

Stone: On gross examination most stones **are yellow or white** in color. they may be round to oval

- Some of the stones are **nodular**
- After decalcification the stone shows **concentric rings** as of the annual rings of a tree trunk
- The stone is **acellular and amorphous** in nature and may contain microbial colonies.

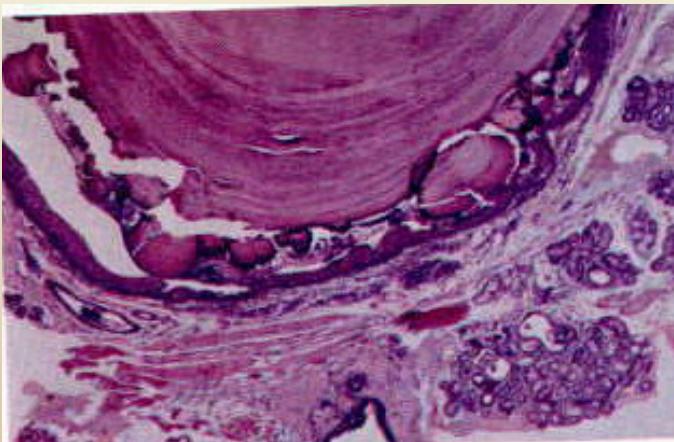


Sialolithiasis

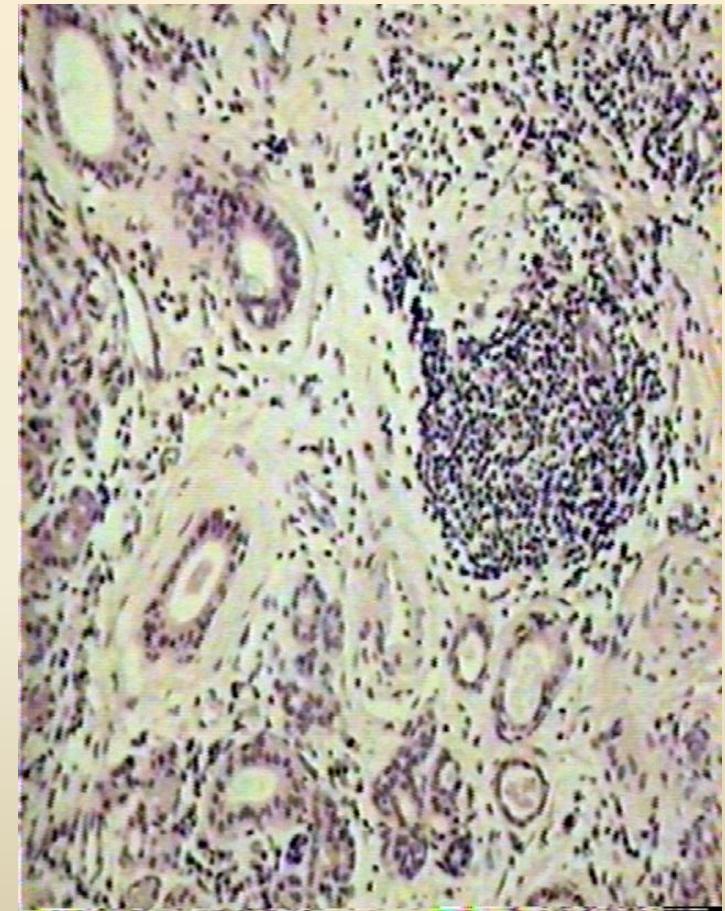
HISTOPATHOLOGY:

Ducts: the ductal lining that surrounds sialolith shows variety of reactive changes.

- There is **squamous and mucus cell metaplasia** and changes to stratified squamous epithelium with numerous mucous goblet cells



Reactive SG lesions



Dr. Natheer Al-Rawi

Necrotising sialometaplasia

- Benign condition
- It is spontaneous condition of an **unknown cause** usually of the **palate** in which large area of the surface epithelium underlying connective tissue and all the associated minor salivary glands become **necrotic while the ducts undergo squamous metaplasia**.



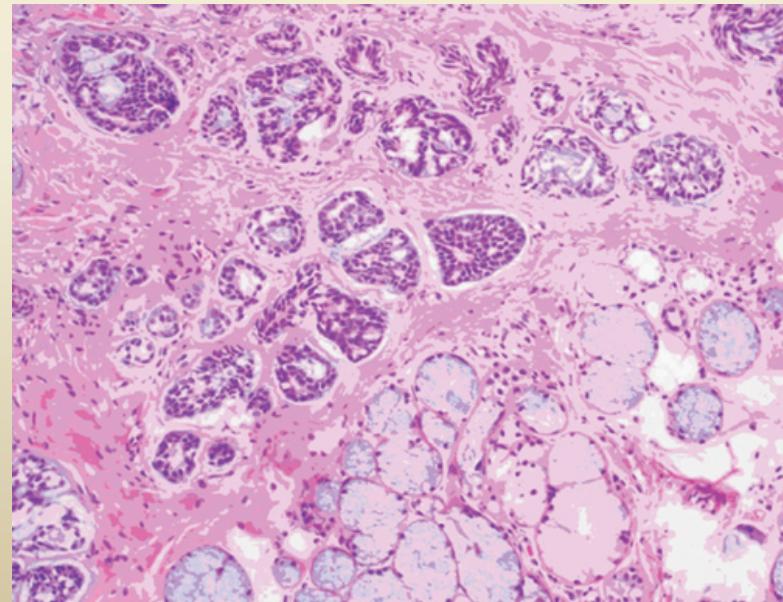
- Usually affects the palate
- **Mimics malignancy (SCC)**
- **Self limiting lesion**, heals by secondary intention over 6-8 weeks

Etiology

- Salivary gland ischaemia due to local trauma

Histology

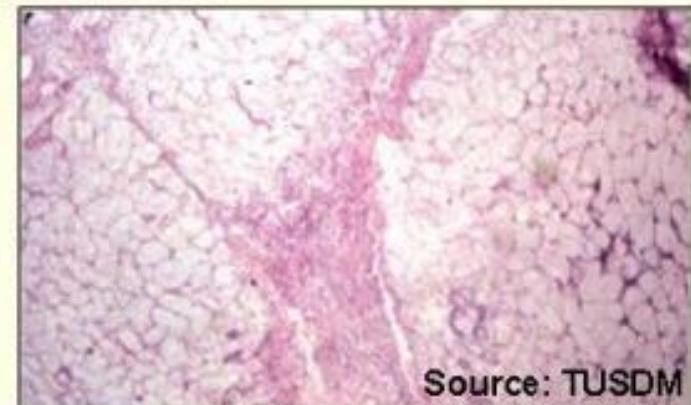
- Salivary gland infarction with ductal metaplasia



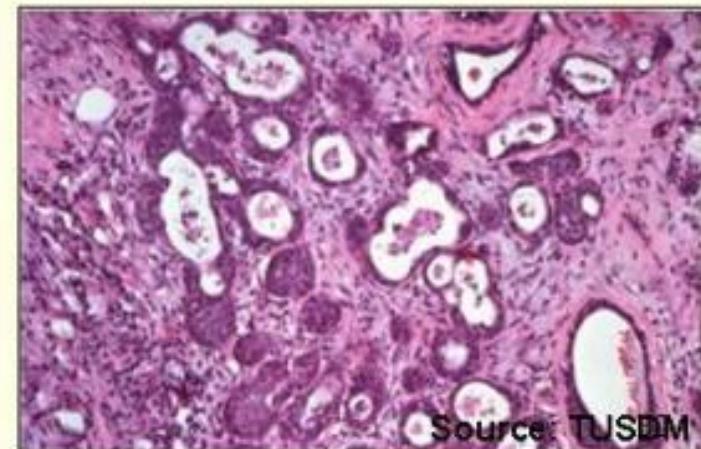
Localized Infarct – Necrotizing Sialometaplasia



Source: TUSDM



Source: TUSDM



Source: TUSDM

(c) 2007, Michael A. Kahn, DDS

Necrotizing Sialometaplasia

CLINICAL FEATURES:

- Usually the location is at the **junction of the hard and the soft** palate but it may also be present at tongue, retromolar pad and the nasal cavity.
- NSM is characterized by **deep seated ulceration** it is punched out
- Within its deep crater are the gray granular lobules which represents the **necrotic minor salivary glands**.
- It is 2-3 cm in diameter.
- It is **asymptomatic** but there may be numbness or burning pain.

Necrotizing Sialometaplasia



Necrotizing sialometaplasia

TREATMENT:

- **No treatment** is required once the diagnosis is confirmed by histological examination .
- The ulcer area **heals by its self** with in 1-3 months.



Thank you