Lecture 12,13,14

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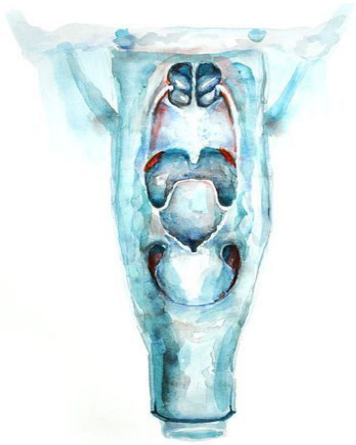


# Head & Neck Tumors I-III

Presented by Prof. Khalid Al-Qahtani / Dr. Manal Manie

## Lecture Objectives:

- ★ Head and Neck I
  - Neck masses:
    - Introduction, anatomy, diagnosis, differential diagnosis, some examples.
  - Thyroid:
    - Anatomy, thyroid nodule evaluation, thyroid cancer surgery and complications.
- ★ Head and Neck II
  - Tumor of oral cavity
    - Introduction, premalignant lesions, Leukoplakia etc.
    - Malignant lesions, SCCA
  - Salivary glands:
    - Anatomy, physiology (in brief) infection, autoimmune and tumours.
- ★ Head and Neck III
  - Tumor of pharynx:
    - Nasopharyngeal carcinoma, Oro & hypopharyngeal carcinoma.
  - Tumor of larynx:
    - Introduction, laryngeal papillomatosis, carcinoma larynx.

### Color Index:

Important Original content Doctor's notes
Golden Notes Extra

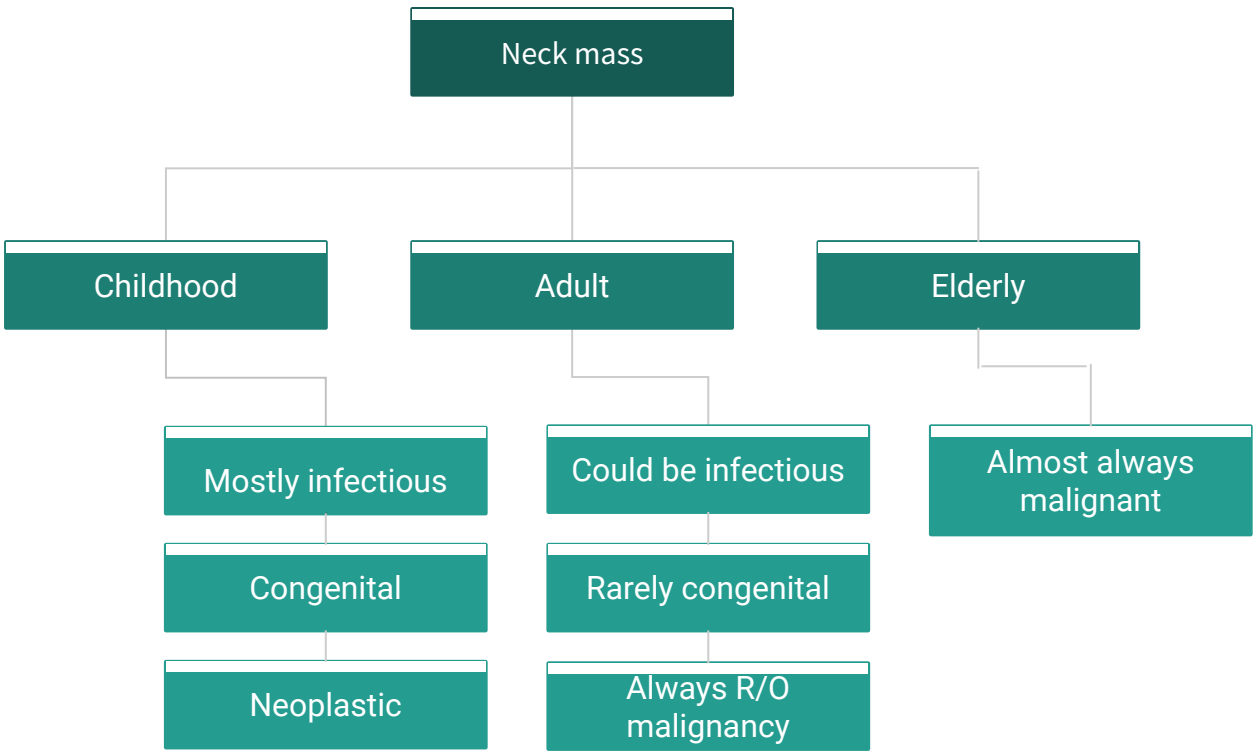
# Introduction

## ◀ The three most important aspects of Hx taking

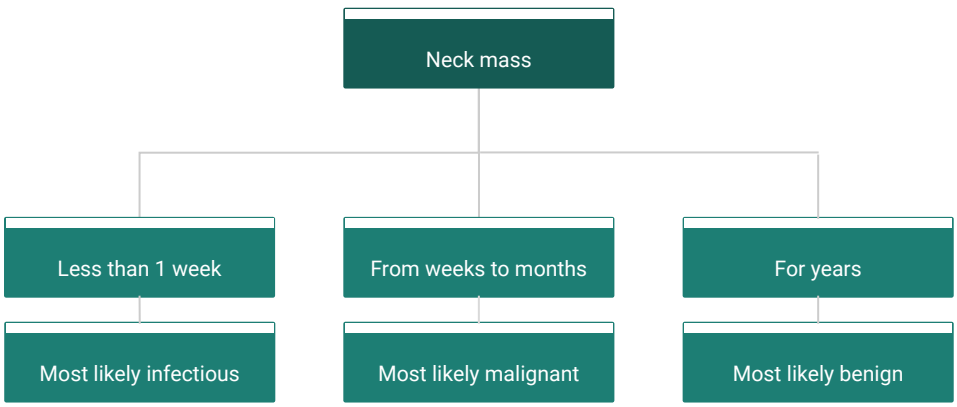
1. Location:
    - Congenital masses: Consistent in location.
    - Metastatic masses: key to primary lesion.
2. Patient age:
    - Pediatrics (0 - 15 years): Mostly benign.
    - Young adults (16-40 years): Similar to pediatrics.
    - Old adults (>40 years): High risk of malignancy.
3. Timeline. Duration

- Alarming signs:
    - Neck mass.
    - Unilateral ENT S/S.

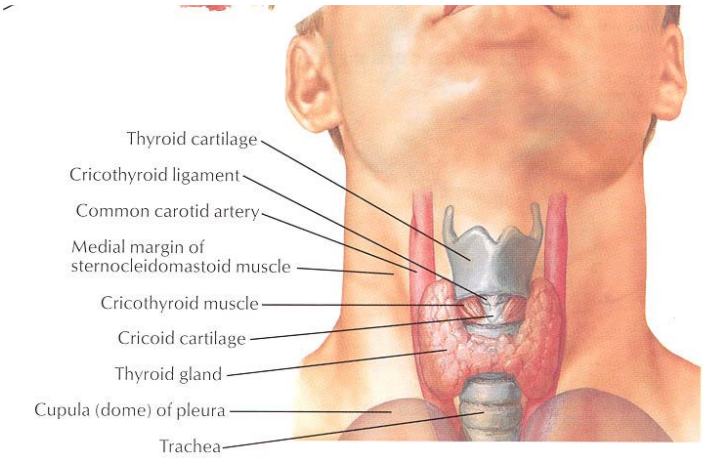
## ◀ Age




## ◀ Timeline



# Anatomical considerations




- Prominent landmarks.
- Triangles of the neck.
    - Lymphatic levels:

Level Ⅰ: submental and submandibular.

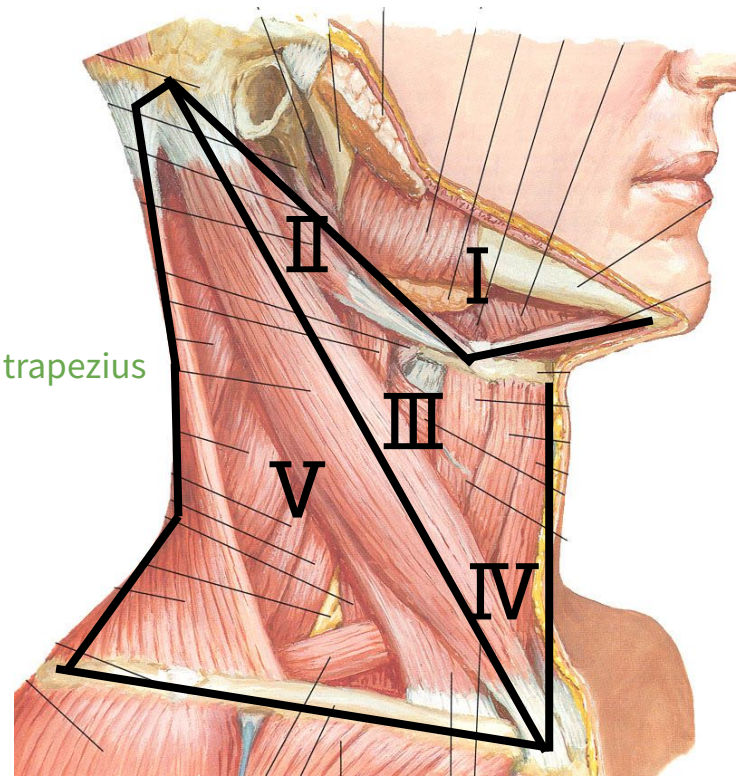
Level Ⅱ: upper jugular.

Level Ⅲ: middle jugular.

Level Ⅳ: lower jugular.

Level Ⅴ: posterior triangle.

- Carotid bulb.




1. Level l : submandibular triangle
2. Level ll : skull base to hyoid bone
3. Level lll :hyoid bone to omohyoid
4. Level lV : omohyoid bone to clavicle
5. Level V : posterior triangle b/t SCM and trapezius muscle

# Anatomy

## ◀ Triangles of the Neck (the sternocleidomastoid divides the neck into 2 triangles)

- **Definition**
  - Two triangular areas found anterior and posterior to the sternocleidomastoid muscles which contain the visceral structures of the neck

### • Anterior Triangle

**Borders:**
- Superior - Inferior border of mandible.
- Medial - Midline of neck.
- Lateral - Anterior border of sternocleidomastoid muscle.

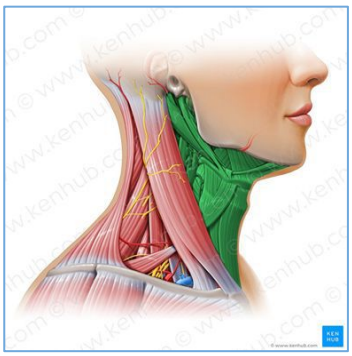
**Subdivisions:**
- Muscular (omotracheal) triangle.
- Carotid triangle.
- Submandibular triangle.
- Submental triangle.

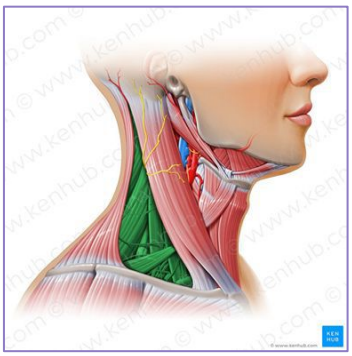
**Contents:**
- Muscles - Thyrohyoid & Sternohyoid muscles
- Organs - Thyroid gland, Parathyroid gland, Larynx & Trachea.
- Arteries - Superior and Inferior thyroid, Common carotid, External carotid, Internal carotid and sinus, Facial, Submental & Lingual arteries.
- Veins - Anterior jugular, Internal jugular, Common facial, Lingual, Superior thyroid, Middle thyroid, Facial, Submental & Lingual veins.
- Nerves - Vagus (CN X), Hypoglossal (CN XII), Sympathetic trunk & Mylohyoid nerves.

**Pathology**:

Congenital:
- Branchial cyst
- Thymic cyst
- Hemangioma
- Torticollis

Acquired:
- Benign:
  - Lipoma.
  - Neurofibroma.
  - Carotid body tumour.
  - Salivary G lesions.
  - Thyroid.
- Malignant.





### • Posterior Triangle

**Borders:**
- Anterior - Posterior margin of sternocleidomastoid muscle.
- Posterior - Anterior margin of trapezius muscle.
- Inferior - Middle one-third of clavicle.

**Subdivisions:** (divided by the omohyoid muscle)
- Occipital triangle.
- Subclavicular (omoclavicular) triangle.

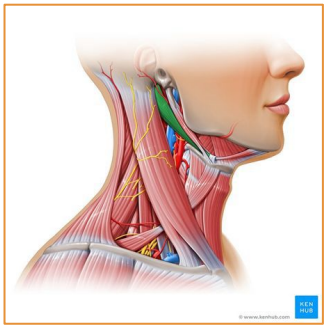
**Contents:**
- Vessels - The third part of the subclavian artery, Supracapsular and transverse cervical branches of the thyrocervical trunk, External jugular vein & The lymph nodes.
- Nerves - Accessory nerve (CN XI), Brachial plexus trunks & Fibers of the cervical plexus.

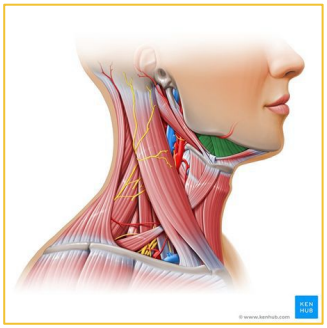
**Pathology:**
- Congenital: Lymphangioma (cystic hygroma).
- Acquired: Lymphadenitis - Lymphoma - Metastatic carcinoma.

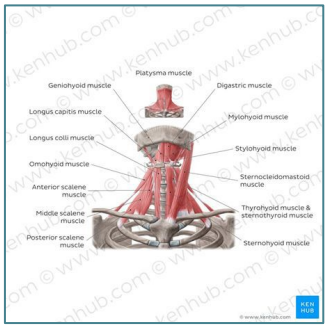
# Anatomy Cont.

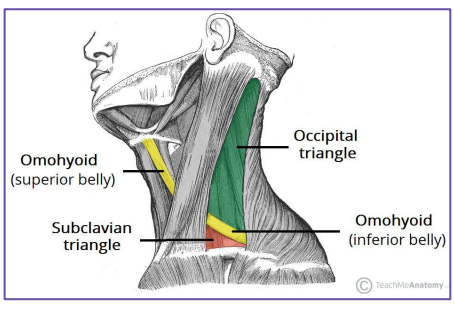
## ◀ Other Triangles of the Neck

| Key Facts About the Triangles of the Neck | |
|---|---|
| **Carotid Triangle** | **Borders:**<br>- Anterior - Superior belly of omohyoid muscle.<br>- Superior - Stylohyoid and posterior belly of digastric muscles.<br>- Posterior - Anterior border of sternocleidomastoid muscle.<br>**Contents:**<br>- Arteries: Common carotid, External carotid and branches *except* maxillary, Superficial temporal and posterior auricular, internal carotid artery and sinus.<br>- Veins: Internal jugular, Common facial, Lingual, Superior thyroid, Middle thyroid veins.<br>- Nerves: Vagus (CN X), Hypoglossal, (CN XII) & Part of the sympathetic trunk. |
| **Submandibular Triangle** | **Borders:**<br>- Superior - Inferior border of mandible<br>- Lateral - Anterior belly of digastric muscle.<br>- Medial - Posterior belly of digastric muscle.<br>**Contents:**<br>- Viscera - Submandibular gland and lymph nodes (anteriorly), Caudal part of the parotid gland (posteriorly).<br>- Vessels: facial artery and vein, submental artery and vein, lingual artery and vein.<br>- Nerves - Mylohyoid & Hypoglossal (CN XII) nerves. |
| **Submental Triangle** | **Borders:**<br>- Inferior - Hyoid bone.<br>- Lateral - Anterior belly of digastric muscle.<br>- Medial - Midline of neck.<br>**Contents:**<br>- Anterior jugular vein, Submental lymph nodes. |
| **Occipital Triangle** | **Borders:**<br>- Anterior - Posterior margin of sternocleidomastoid muscle.<br>- Posterior - Anterior margin of trapezius muscle.<br>- Inferior - Inferior belly of omohyoid muscle.<br>**Contents:**<br>- Accessory nerve (CN XI), Branches of the cervical plexus, Upper most part of brachial plexus, supraclavicular nerve. |







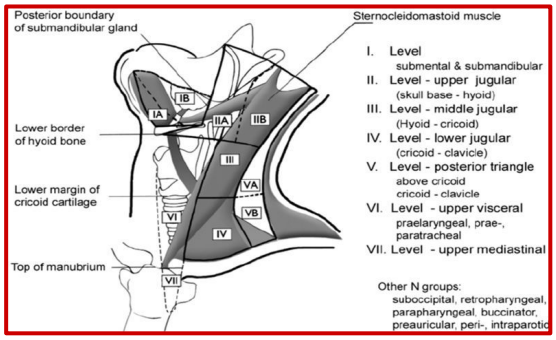
## ◄ Other Triangles of the Neck

| Key Facts About the Triangles of the Neck | |
|---|---|
| **Supraclavicular Triangle** | **Borders:**<br>- Superior - Inferior belly of omohyoid muscle.<br>- Anterior - Posterior edge of sternocleidomastoid muscle.<br>- Posterior - Anterior edge of trapezius muscle.<br>**Contents:**<br>- Third part of the subclavian artery, Brachial plexus trunks, Nerve to subclavius muscle & Lymph nodes. |

## ◄ Cervical Lymph Nodes

**Lymphatic triangles: anatomical point of view:**

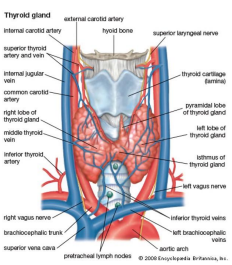
- Anterior: lied by midline anteriorly and SCM posteriorly.
- Posterior: lied by SCM anteriorly and Trapezius posteriorly.

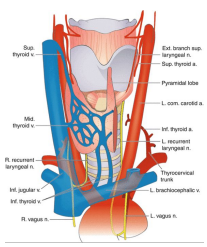


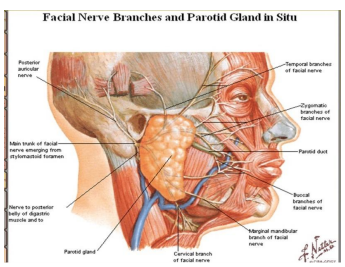

**Notes**: Cervical lymph nodes are very important & commonly present in the exam (especially levels 2 & 3). Know each level, its content, and boundaries. Level 1 lymph nodes are divided to 1A (Submental Part) & 1B (Submandibular Part). Level 2 (also called the upper jugular, extends from the base of the skull up to the hyoid bone; & is divided by the accessory nerve to IIA & IIB). Level 3 (Middle jugular, from the hyoid up to cricoid). Level 4 (from the cricoid up to the clavicle). Level 5 (posterior triangle) divided by the accessory nerve to 5A & 5B. Level 6 (around the trachea, removed in thyroid surgeries). Level 7 (upper mediastinal).

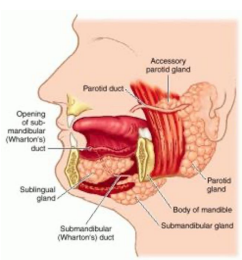
## ◄ Anatomy of Thyroid, Parotid and Submandibular Glands

| Contents of the Head & Neck | |
|---|---|
| **Thyroid gland** | ○ Butterfly-shaped gland.<br>○ Isthmus :overlying 2nd to 4th tracheal rings. (doctor said to 3rd, and it varies between individuals). Supplied by the recurrent laryngeal nerve<br>○ Parathyroids: Posterior to thyroid gland. |
| **Parotid Gland** | ○ Lies over the angle of mandible.<br>○ Divided to superficial and deep lobes by the facial nerve.<br>○ Stenson's duct: opens in the mouth opposite to maxillary second molar. |
| **Submandibular Gland** | ○ Lies inferior and posterior to the mandible.<br>○ Mylohyoid muscle runs through the lobules of the gland and section it into superficial and deep parts (lobes)<br>○ Wharton's duct opens at the lingual papillae. |



# Anatomy (extra 436)

Anatomical landmarks: Angel of mandible and Clavicle and mastoid. The ONLY obvious landmarks in every single patient including obese. Always look for bones! So, make sure you locate them before starting your examination.

➔ In the midline of the neck, there is a cricoid. Anything above the cricoid is called upper midline (your DDx will be B/W the carotids).

➔ Anything below the cricoid to the Suprasternal notch, we call it lower Midline (DDX related to thyroid lobes).

Thyroid:

- Shield shaped, may be H- or U-shaped.
- 2 lateral lobes connected by an isthmus.
- Isthmus at level of 2nd to 4th tracheal cartilages (may be absent) each lobe measures approximately 4 cm high, 1.5 cm wide, 2 cm deep.

Lobes have superior and inferior poles:

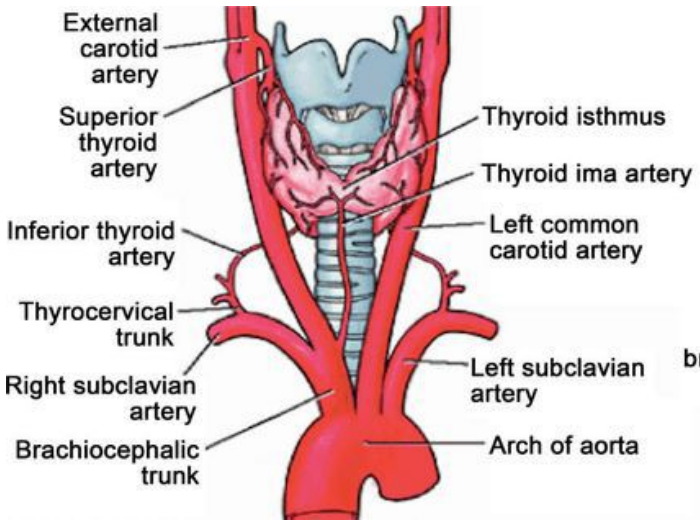
- Superior pole: may extend as far as the oblique line of the thyroid cartilage.
- Inferior pole: may extend inferiorly as far as the 5th or 6th tracheal rings.

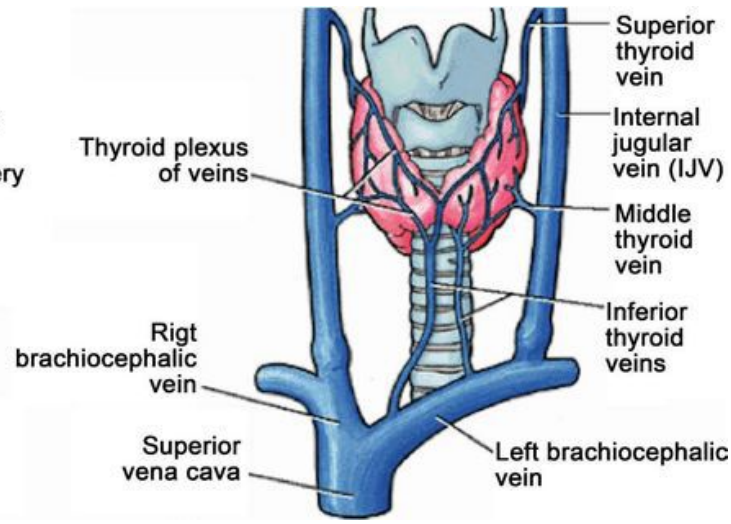
Arterial Blood Supply:

- Superior thyroid artery (STA): 1st branch of ECA, Followed by SLN until superior pole, Anastomosis with contralateral STA.
- Inferior thyroid artery (ITA): From thyrocervical trunk (1st part of subclavian at 1st rib)

Venous Drainage: 3 pairs of veins:

- Superior thyroid vein: Parallels course of STA on ant surface thyroid, Ascends to drain into internal jugular vein (IJV).
- Middle thyroid vein: Direct lateral course from thyroid to IJV, Shortest of 3 veins.
- Inferior thyroid vein: Ant surface thyroid (opposite of ITA), Vertical downward course to brachiocephalic v.3.



# Approach to Neck Masses

## History

- **Age** (pediatric causes are usually infectious or congenital, while in the elderly it could be tumors), gender (some conditions like thyroid are more common in females), ethnicity (e.g., pharyngeal cancer is more common in asians).
- **Duration of neck mass** (short duration is likely infectious; while longer ones (>2 weeks) are likely to be malignant, if it's since birth, it's likely to be congenital).
- **Location of the mass**
- Progression (of the mass size, increasing or decreasing; slow or fast growing).
- Associated symptoms :URTI, dysphagia, otalgia, voice.
- Voice change (pressure or recurrent laryngeal injury by thyroid/neck masses).
- Hx of cough, fever, sore throat, night sweats,weight loss → suspect malignancy or TB
- Recent travel (goes more with infectious).
- Insect bite.
- Dental problems (could lead to deep brain abscess)
- Tobacco and alcohol use (risk factors for malignancy)
- Previous irradiation or surgery (risk factors for malignancy)
- Family history of malignancy.

## Physical Examination

- **For each patient with any neck mass, perform a** full head and neck examination including the cranial nerves and nasopharyngolaryngoscopy.
- Location of the mass: midline (thyroid mass, thyroglossal duct cyst, dermoid cyst), lateral (branchial cyst, lymph node enlargement).
- Size, consistency, tenderness (more with infectious), mobility.
- Pulsation (might be a vascular mass)
- Skin changes.
- Movement with swallowing or tongue protrusion (thyroglossal duct cyst common in exams).
- Emphasis on location, mobility and consistency

## Diagnostic Tests

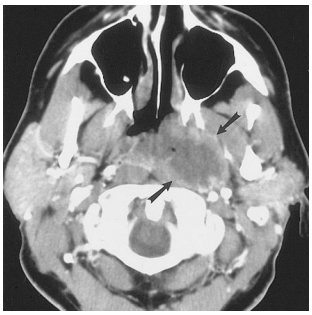
- Computed tomography (CT).
- Fine needle aspiration biopsy (FNAB).
- Magnetic resonance imaging (MRI).
- Ultrasonography.

# Approach to Neck Masses

## ◀ Diagnostic Tests Cont.

**Computed Tomography:**

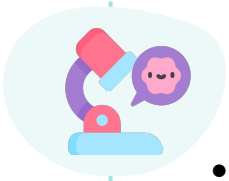
- Distinguish cystic from solid.
- Extent of lesion.
- Vascularity (with contrast).
- Detection of unknown primary (metastatic).
- Pathologic node (lucent, >1.5cm, loss of shape).



**Fine Needle Aspiration Biopsy:**

- Standard of diagnosis.
- Indications:
  - Any neck mass that is not an obvious abscess.
  - Persistence after a 2 week course of antibiotics.
- Small gauge needle:
  - Reduces bleeding.
  - Seeding of tumor - not a concern.
- No contraindications (vascular ?).

## ◀ Differential Diagnosis



- **Adults:**
  - Infective and inflammatory masses.
  - **Neoplastic masses.**
  - Vascular masses.
  - Traumatic masses.
  - Metabolic, idiopathic and autoimmune conditions.
  - Thyroid gland masses.
  - Salivary gland masses.
  - Parapharyngeal masses.
- **Pediatric:**
  - Infective and inflammatory masses.
  - **Congenital masses.**
  - Vascular masses.
  - Traumatic masses.
  - Metabolic, idiopathic and autoimmune conditions.

| | Anterior Triangle | Midline | Posterior Triangle |
|---|---|---|---|
| Inflammatory | Adenitis from various causes<br>Reactive adenopathy<br>Parotitis<br>Atypical mycobacteria | Adenitis<br>Thyroiditis<br>Ludwig's angina | Adenitis<br>Sialadenitis |
| Congenital | Branchial cleft cyst<br>Laryngocoele<br>Congenital torticollis | Thyroglossal duct cyst<br>Dermoid cyst | Cystic hygroma |
| Neoplastic | Hemangioma<br>Neurogenic tumors<br>Salivary gland tumors | Thymomas<br>Lymphoma<br>Lipoma<br>Goiter | Lymphoma<br>Metastatic lesions<br>Neuroblastoma<br>Rhabdomyosarcoma |
| Traumatic | Hematoma<br>Acquired torticollis | Laryngeal fracture | Hematoma<br>Acquired torticollis |

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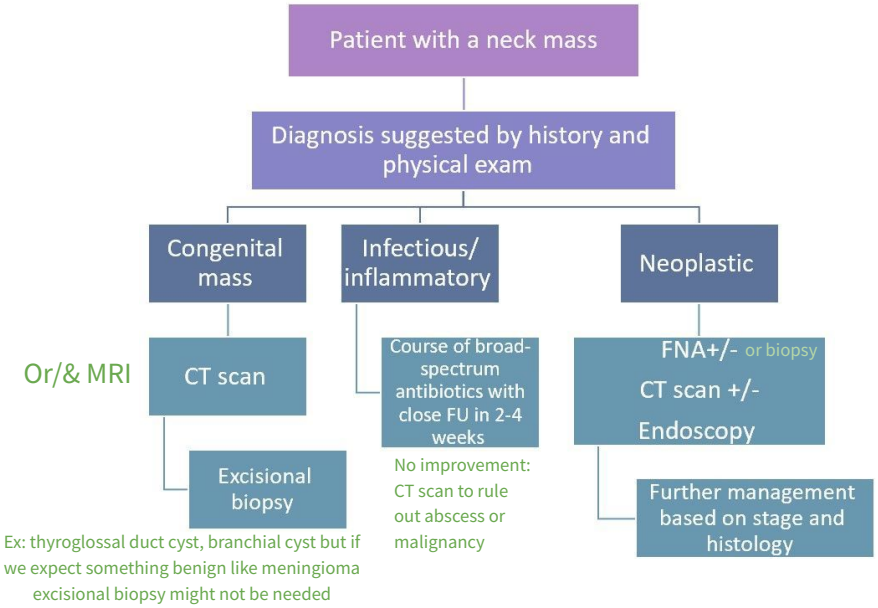
**Table 1. Common Neck Masses**

| Neoplastic | Congential/Developmental | Inflammatory |
|---|---|---|
| Metastatic Unknown primary epidermoid carcinoma | Sebaceous cysts | Lymphadenopathy |
| Primary head and neck epidermoid carcinoma or melanoma | Branchial cleft cysts | Bacterial |
| Adenocarcinoma | Thyroglossal duct cysts | Viral |
| Thyroid | | Granulomatous |
| Lymphoma | Lymphangioma/hemangioma | |
| Salivary | Dermoid cysts | Tuberculous |
| Lipoma | Ectopic thyroid tissue | Catscratch |
| Angioma | Laryngocele | Sarcoidosis |
| Carotid body tumor | Pharyngeal diverticulum | Fungal |
| Rhabdomyosarcoma | Thymic cysts | Sialadenitis |
| | | Parotid |
| | | Submaxillary |
| | | Congenital cysts |
| | | Throtrast granulomas |

## ◀ General Approach to Neck Masses

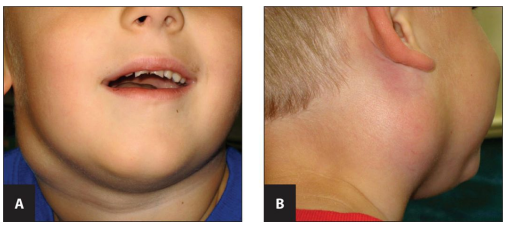



# Infectious/inflammatory masses

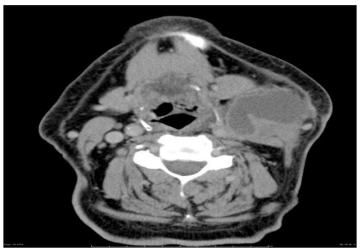
## ◀ Cervical lymphadenitis

- Most common in children and adolescents.
- Etiology:
  1. Bacterial: streptococcal and staphylococcal infections, mycobacterial infections (common here), secondary to dental or tonsillitis and rarely cat-scratch disease and actinomyces.
  2. Viral: EBV, CMV, herpes simplex virus, others.
  3. Parasitic: toxoplasmosis.
  4. Fungal (rare): coccidiomycosis.
  5. Sialadenitis, common,inflammation of salivary glands
- Diagnosis: CBC (for leukocytosis), CT scan (if patient does not respond to antibiotic, to check for any abscess).
- Treatment: broad spectrum antibiotics.
- Rule out neck abscess formation if no improvement with antibiotics by CT neck **with contrast**.
- Incision and drainage (important): in case of abscess or pain continue despite the antibiotics.

Boy Image: Enlargement of lymph node at **level 2** (you should know the borders of level 2; they might ask you to define it). We see redness, which goes with inflammatory/infectious causes.

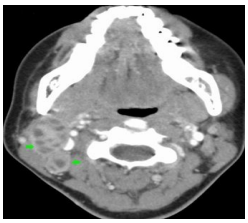



Patient has taken antibiotics for 2 weeks with no improvement what is the next step? CT scan with contrast
CT Scan: Axial cut with contrast showing a collection (abscess formation).

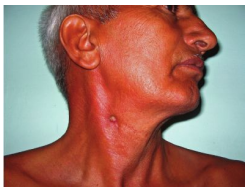


## ◀ Tuberculous cervical lymphadenitis

- Scrofula (another name).
- Most common manifestation of extrapulmonary TB.
- Non tender.
- If untreated, spontaneous discharge and sinus formation (Sometimes we don't really know it's TB and we do incision & drainage and it gets complicated with sinus formation but if we know it's TB we don't do incision & drainage especially if it's not acute then it's treated medically and we do aspiration to prevent sinus formation).
- CT scan may show necrotic/cystic nodal matting (Matting: Multiple lymph nodes adherent to each other -- characteristic for TB).
- FNA (for culture) / excisional biopsy (excisional biopsy: to differentiate between TB and lymphoma).
- Treatment: antimycobacterial medications.



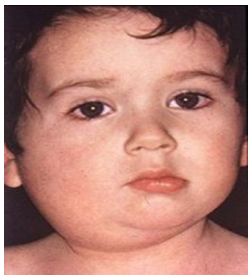
Matting



Sometimes confused with malignancy

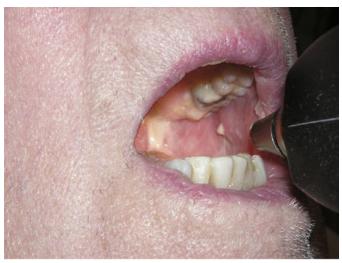
## ◀ Mumps (viral parotitis)

- Viral infection caused by paramyxovirus.
- Droplet infection and fomites.
- Children are more affected.
- Fever, malaise, parotid swelling.
- Orchitis , ophritis, aseptic meningitis , unilateral SNHL.
- Treatment is supportive, hydration and analgesics.



## ◀ Acute suppurative parotitis/sialadenitis

- Commonly seen in elderly, diabetic, debilitated and dehydrated, & in some oncology patients.
- Staph aureus is the usual causative organism.
- Fever, swelling , pus from stensen's duct.
- Antibiotics and hydration.
- If you suspect abscess do CT + incision & drainage.



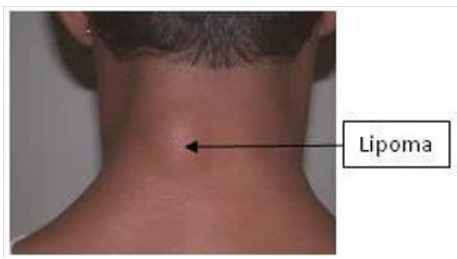
# Neoplastic Masses

➔ **Benign:**

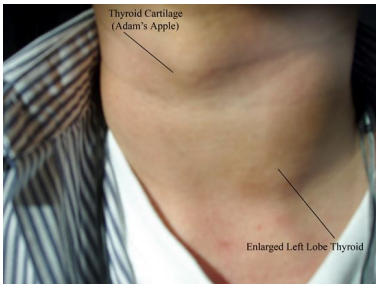
- Lipoma, fibroma, neuroma and schwannoma.

➔ **Malignant:**

- Primary neck tumors – sarcoma, salivary gland tumors, thyroid gland tumors, parathyroid gland tumors.
- Lymphoma. (common)
- Metastasis.



# ◀ Thyroid gland nodules




- Benign thyroid nodules (central neck masses) are very common (especially in females)
- 5-10 % are malignant.
- Hot vs cold, the most common is cold.

➔ **Thyroid Nodule Evaluation:**

- U/S (1st & **best** modality - shows nodule characteristics).
- FNA (2nd step, done if indicated).
- Thyroid Function Tests.
- CT (has certain indications; like in huge goiter to rule out sternal extension, if there is voice hoarseness (affecting the RLN) or when you suspect lymph nodes metastasis).

■ **Risk factors for malignancy:**

➔ **History:**

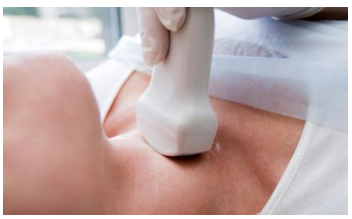
- External radiation during childhood.
- Age <20 or >60 years.
- Male gender.
- Family history of thyroid cancer.
- Hoarseness, dysphagia (indicate invasion or compression of nearby structures e.g. esophagus, recurrent laryngeal nerve).
- Rapid growth (goes with lymphoma, other malignancies, or transformation from differentiated thyroid cancer to undifferentiated thyroid cancer like in anaplastic thyroid carcinoma)

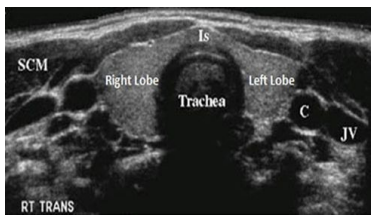
➔ **Physical Exam:**

- Firm or hard (goes with malignancy).
- Fixed to soft tissue or skin.
- Lymphadenopathy.

# ◀ Thyroid Imaging

- **Ultrasound:** Best for thyroid
  - Often first modality, helps delineate architecture.
  - Accessible, inexpensive, safe.
  - Help locate nodule, assist with FNA.
  - Micro-calcifications and central blood flow.
    - Suggests CA.
  - Not useful for large masses.



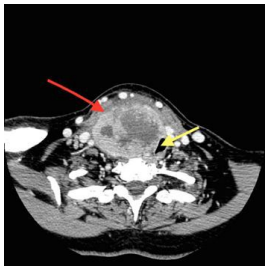



**Characteristics of thyroid nodules that increase suspicious of malignancy:**

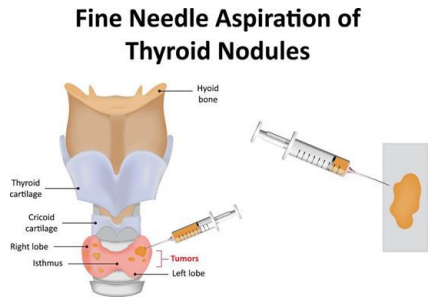
- Taller than wide shape (oval)
- Spiculated (irregular) margin.
- Microcalcifications.
- Marked hypoechogenicity.
- Increased vascularity.

- **CT scan:**

  **Cases indicating CT scan:**
  - Recurrent disease.
  - Lymph node metastasis.
  - Vocal cord paralysis.
  - Fixation of tumor to adjacent structures or skin.
  - Huge goiter, retrosternal extension.



## ◀ Thyroid Biopsy




- **Fine needle aspiration (FNA):**
  - Gold standard.
  - Sensitivity ⟶ 65% to 98%
  - Specificity ⟶ 72% to 100%
  - Safe and minimally invasive.
  - Indicated for nodules > 1 cm except if it looks purely cystic (benign) and it's > 1 cm but 2 cm or less then no need for FNA or nodules with suspicious features of malignancy (even if it's small < 1 cm)
  - US guided FNA (to be specific).
    - Results of FNA:
      - Non-diagnostic (repeat it) ⟶ re-aspiration diagnostic in 50%.
      - Benign (observe) ⟶ adenoma, goitre, thyroiditis.
      - Indeterminate (do diagnostic lobectomy) ⟶ FTC and Hurthle most common.
      - Malignant (surgery) ⟶ most common PTC.

## ◀ Malignant Thyroid Lesions

1. **Well Differentiated (85%):**
   - Papillary Thyroid Carcinoma (PTC) most common.
   - Follicular Thyroid Carcinoma (FTC).
   - Hurthle Cell Carcinoma (HCC).
2. **Poor differentiated malignant neoplasms:**
   - Medullary thyroid carcinoma (MTC).
   - Anaplastic thyroid carcinoma (ATC).
3. **Other malignant tumors:**
   - Lymphoma.
   - Metastatic tumors.

437A: for thyroid we always start with US.
MCQs: 1- WHAT is the imaging of choice for any mass?? IF NOT IN THE THYROID, WE DO CT SCAN WITH CONTRAST 2- Pic shows a mass in the nasopharynx, how do we confirm it's a nasopharyngeal carcinoma? TAKE a BIOPSY.

We always start with CT-contrast in ENT except in:
1-Pediatrics
2-Pregnant
3-Thyroid

- Treatment:
  - Observation for small (1-2 cm), benign looking and not causing any compression symptoms, cystic nodules.
  - Follow Up with ultrasound every 6 months to monitor progression or look for any malignant transformation.
- Thyroidectomy indicated for:
  - Malignancy or Suspicious for malignancy.
  - Compression symptoms (shortness of breath, voice changes, dysphagia).
  - Cosmetic.
  - Graves disease if not responding to medical Tx.
  - Toxic nodule.
  - The choice to do total or hemithyroidectomy is controversial & depends on the diagnosis, but almost always if there is malignancy: total thyroidectomy)
- Post op complications:
  - RLN Injury recurrent laryngeal nerve (<1%, if unilateral: hoarseness/aspiration, if bilateral: airway symptoms/stridor).
  - Hypocalcemia (due to parathyroid gland injury, can be transient or permanent).
  - Hematoma, usually happens within first 24 hrs and patient presents with shortness of breath & stridor.

# Thyroid Neoplasms Extra 436

## 1- Well Differentiated (85%):

### A- Papillary Thyroid Carcinoma (PTC):

**The most common type.**

- Constitutes 80% of thyroid carcinomas.
- Spreads lymphatically and slowly.
- 10 yr. survival rate is 95%. Good 131 I uptake.
- Lymph node involvement in 30%.
- Distant mets least common: 1 - 25% during illness or 1 - 7% at Dx.
- Predisposing Factors: Ionizing radiation - 5-10% of pts have +ve FamilyHx.
- Clinical presentation: Young females,palpable mass in thyroid or cervical LN ( 1/3rd have lymphadenopathy).

➔ Treatment:

- Hemithyroidectomy (usually not enough).
- Or Total Thyroidectomy most appropriate.
- Post-Op need to give thyroid hormone replacement.
- Post-Op 131 I scan can diagnose and treat!
- **Can be metastasized.**

### B- Follicular Thyroid Carcinoma (FTC):

- 13% of thyroid cancers.
- Hematogenous spread (commonly to bone).
- More aggressive, well differentiated compared to PTC.
- Good 131 I uptake.
- 10 yr. survival is 90%.
- Dx cannot be made with FNA!!!
- Tissue structure (capsule) needed for diagnosis.
- Malignancy if there is capsular or blood vessel invasion.
- Tx same as in papillary cancer.

### C- Hurthle Cell Carcinoma (HCC):

- Subtype of FTC (15% of FTC's).
- Like FTC, cannot exclude carcinoma vs adenoma based of FNA or frozen.
- Clinical Presentation: Thyroid nodule or mass - 35 % will have distant mets during illness - Higher rate o nodal mets than FTC.

➔ Surgical options:

- Total thyroidectomy (>1.5cm).
- Thyroid lobectomy (<1.5cm).
- +/- Neck dissection.

➔ Adjuvant Therapy:

- Post-op I-131
- External beam RT: Tumors that do not pick up I-131 - Advanced disease (mets, residual disease).

## 2- Poor differentiated malignant neoplasms:

### A- Medullary thyroid carcinoma (MTC):

- Sporadic (80%) More Aggressive Type - Late presentation (age 40 – 60) - Early Mets To Regional Lymph Nodes(50%).
- Familial (20%):
  - MEN IIA, MEN IIB, Non-endocrinopathic o Mutation in RET-proto oncogene.
  - Autosomal Dominant.
  - Early presentation (birth – 20's).

➔ Treatment:

- Total thyroidectomy with bilateral SLND.
- Prophylactic surgery for relatives with RET mutation (preferably before age 7) No adjuvant therapy advocated.
- Radiotherapy and chemotherapy for palliation (usually ineffective).

B- Anaplastic thyroid carcinoma (ATC):

- Undifferentiated carcinoma arising in 75% of previously differentiated thyroid cancers.
- 1-2% of all thyroid cancers.
- FNA helps diagnose.
- Major DDx includes lymphoma (much better prognosis).
- Highly aggressive and fatal.
- Median survival 3 - 6 months.
- Distant mets common (lung).
- Grossly, large and bulky tumors.
- Invade into surrounding tissue.
- Rapid expansion.
- Treat small tumors: Total Thyroidectomy (possibly w external beam radiation).
- If there is airway obstruction, then do a **debulking surgery and tracheostomy.**
- **Dismal prognosis:** Most pt have stage IV (distant mets) at presentation.

# 3- Other malignant tumors:

A- Lymphoma:

- More common in children and young adults.
- Up to 80% of children with Hodgkin's have a neck mass.
- Signs and symptoms:
    - Lateral neck mass only (discrete, rubbery, nontender), not impro w antibiotics.
    - Fever.
    - Hepatosplenomegaly.
    - Diffuse adenopathy.

➔ Investigations:

- CT head and neck with contrast "showed multiple lymph node, 3—4 cm, homogeneous,WHAT'S next? FNAB. DON'T FORGET THAT!!! MCQs.
- FNAB – first line diagnostic test.
- If suggestive of lymphoma – open biopsy. ONLY DONE If: we don't know the diagnosis or FNAB showed lymphoma.
- Full workup – CT scans of chest, abdomen, head and neck; bone marrow biopsy.

B- Metastatic tumors:

- Be aware that the immediate removal of enlarged lymph node for diagnostic purposes is NOT GOOD for pt w metastatic cervical carcinoma. Disruption of lymphatic drainage and manipulation of the mets decrease chance for clean excision and cure.
- Enlarged nodes high in neck or in posterior triangle suggest nasopharyngeal lesion.
- Enlarged jugulodigastric nodes suggest tonsils, base of tongue or supraglottic larynx.
- If nodes are in supraclavicular area or lower 1/3 or neck then consider the whole digestive tract, lungs, breast, GU tract, and thyroid gland.
- Mets spread from chest or abdomen via thoracic duct (left side mets more common than right).

In summary, treatment of malignant thyroid lesions is as follows: Important

| Malignant of thyroid cancer | | |
|---|---|---|
| **Type** | | **Management** |
| **Well-differentiated** | **Papillary carcinoma** | Total thyroidectomy + post-op Radioactive Iodine (I-131) |
| | **Follicular carcinoma** | |
| | **Hurthle cell carcinoma (sub-type of follicular)** | |
| **Poorly-differentiated** | **Medullary carcinoma** | Total thyroidectomy + Neck dissection "removal of level 2,3 & 4 lymph nodes" |
| | **Anaplastic carcinoma** | Surgery, Adjuvant radiation & Chemotherapy. (palliative chemo+tracheostomy) |

lymphoma: chemotherapy

# Diffuse Thyroid Enlargement Extra 436

**Definition of Goiter:**

-A goiter is diffuse enlargement of the thyroid gland seen in Graves' Disease, Plummer's Disease, Iodine Deficiency, Acute Thyroiditis, Subacute Thyroiditis, and Chronic Thyroiditis (Hashimoto's and Riedel's Diseases).
-Also, goiters are seen in Diffuse Multinodular Goiter. So, patient with a goiter can be clinically euthyroid, hyperthyroid or hypothyroid. (Most important test is TSH)

## Grave's Disease

- Diffuse goiter with hyperthyroidism, exophthalmos, and pretibial myxedema.
- **Caused by** circulating antibodies that stimulate TSH receptors on follicular cells of the thyroid and cause deregulated production of thyroid hormones.
- **Diagnosed by** Increased T3 and T4 and very low TSH and global uptake of radioiodine.
- **Treated in 3 ways:** medical blockade (methimazole, PTU, propranolol, iodide), radioiodine ablation, surgical resection.

## Acute Thyroiditis

- Rare complication of septicemia. High fever, redness of overlying skin, tenderness.
- **Needle aspiration to identify organism.**
- Intensive Abx therapy.
- Occasionally, incision and drainage.

## Subacute Thyroiditis

-Secondary to viral infection and usually there is complete resolution within months.
-Fever, goiter and anterior neck pain. Possible sx and signs of hyperthyroidism w exquisitely tender thyroid gland on palpation.
-"Cold" uptake on scan distinguishes it from Graves b/c later in the course of the disease, pt becomes euthyroid and then hypothyroid.
Treat with NSAIDS usually or prednisone if sx are bad.

## Chronic Thyroiditis

-Hashimoto's Thyroiditis: lymphocytic infiltration and destruction of gland resulting in hypothyroidism and a diffuse goiter.
-Hashimoto's common in women.
-Most common cause of goiter and hypothyroidism in USA.
-T3 and T4 either normal or low. TSH is elevated.
-Tx: thyroxine but then surgery if dominant mass is not suppressed by this therapy.

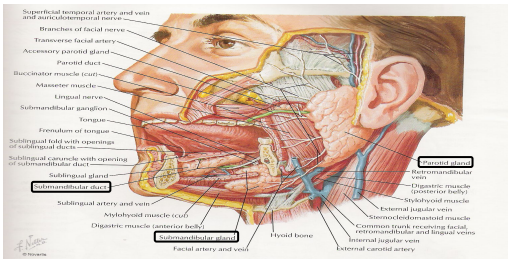
## Diffuse Multinodular Goiter

-This is adenomatous hyperplasia of the thyroid gland that is asymptomatic (non-toxic/euthyroid).. R/O malignancy w FNA.
-Multiple nodules suggest a metabolic rather than a neoplastic process, but irradiation during childhood, a positive family history, enlarged cervical nodes, or continuing enlargement of one of the nodules raises the suspicion of malignancy.

## Iodine Deficiency:

Rarely a cause of goiter in the USA.
If seen, it is usually treated medically and only rarely surgically for compressive symptoms.

# Salivary Glands




- There are 6 major salivary glands: 2 parotid, 2 submandibular, 2 sublingual.
- 100's of minor salivary glands lining the upper aerodigestive tract
- It's main job.... Saliva!!!!

- **Parotids**: **(most common gland to get infected)**
  - Serous cells only (**weak** bacteriostatic factors BC. it's serous).
  - On side of the face, deep to skin, subcutaneous tissue, superficial to the masseter.
  - Stensen's duct begins at anterior border of the gland 1.5cm below the zygoma.
  - Traverses the masseter 5-6 cm, pierces the buccinator.
  - Opens in mouth lateral to 2nd upper molar.
  - Tail of parotid extends superficial to SCM.
    - ➢ **Nerve Injured during surgery? Marginal mandibular nerve.(Branch of the facial nerve)**
- **Submandibular gland:**
  - Mucous and Serous cells.(Secretion is thick & mucous, so less chances of infection but more chances of stones.)
  - Submandibular triangle: Anterior and Posterior bellies of digastric and Inferior margin of the mandible.
  - Medial and Inferior to the mandible; **Wharton's duct**.
    - Exits the gland from the medial surface travels b/w the hyoglossus and mylohyoid muscles enters the genioglossus muscle and opens into mouth just lateral to lingual frenulum.
  - CN XII Inferior to the duct and lingual nerve is Superior to the duct.
  - ➢ **Nerve injured during surgery?**
    1. **Marginal mandibular nerve (most common).**
    2. **Lingual nerve.**
    3. **Hypoglossal nerve.**

- **Sublingual gland:**
  - Mucous secreting.
  - Just below the floor of mouth mucosa.
  - Bordered by genioglossus/hyoglossus medially, mandible laterally, and mylohyoid inferiorly.
  - Wharton's duct and lingual n. travel b/w SL gland and genioglossus muscle.
  - No facial capsule.
  - Ducts of Rivinus (~10) along the superior aspect of the gland open into the mouth along sublingual fold in the floor of mouth.
  - Innervated by the PNS/CNS systems in the same way as the SM gland.

- **Minor salivary glands:**
  - Either mucous, serous or both.
  - 600-1000 /person
  - Each gland has its own duct
  - Found most commonly in buccal, labial, palatal, and lingual regions.

- **Salivary flow rates:**
  - ~1000-1500 ml/24 hrs, or 1 ml/min.
  - Unstimulated 69% of flow from SM gland, 26% parotid, 5% SL.
  - Stimulated parotid and SM.
  - Minor glands independent of stimulation usually account for 7-8% total flow.

**Role of saliva:**

**- Lubricates. -Moistens, help with mastication. - Cools hot food. -Buffers chemicals.**
**-Homeostasis --Cleans the mouth (lavage). -Prevent dental caries. - Protects mucosa.**
**- Antibacterial (lysozyme, IgA, peroxidase).**

# Infections of the Salivary Gland

- **Acute Suppurative Sialoadentitis:**
  - "Surgical parotitis", "Surgical mumps" >Other names
  - Retrograde migration of bacteria from the oral cavity.
  - Parotid gland most frequently involved,
    - inferior bacteriostatic properties.

➔ ***Symptoms of Acute infections:***

- Rapid onset of pain, swelling, induration.
- Fever chills.
- Increased WBC count.
- Suppurative discharge from the gland.
- S. Aureus.

➔ ***Treatment:***

- Antibiotics.
- Steroids.
- Analgesics.
- Local heat application.
- Increased fluid intake.
- Surgical treatment if no improvement within 48h.
- CT or US to rule out abscess.
- Sialogram C/I in acute phase.

**Pathogenesis of Acute infections:**

- Stasis permits retrograde flow.
- Compromised host resistance.
- Poor oral hygiene (increase oral bacteria).
- Chronic disease or prolonged recovery.
- DEHYDRATION.
- Anticholinergics or diuretics.
- Anorexia reduces salivation.
- 25% bilateral.

- **Viral Infections – Mumps:**
  - Most common nonsuppurative infection.
  - Children.
  - Parotid (occ. SMG).
  - Bilateral, generalized swelling.
  - Paramyxovirus
    – Highly contagious.
    – Airborne droplet spread.
    – Incubation 18 days.
    – Virus spread for 1 week following swelling.
  - Treatment:
    – Hydration
    – Rest
    – Modify diet to decrease gland stimulation

- **Acquired Immunodeficiency Syndrome:**
  - HIV.
  - Lymphoproliferative and cystic enlargement of the major salivary glands.
  - High suppressor T-cells and lymphocytosis.
  - Can be initial presentation.
  - Parotid (15- 30% bilateral) with lymphocytic interstitial pneumonitis.
  - HIV in saliva.

- **Chronic Sialoadentitis:**
  - Repeated episodes of pain and inflammation.
  - Parenchymal degeneration and fibrous replacement of the gland
  - Initial severe acute infection.
  - Duct obstruction.
  - Depressed glandular secretion.
  - Parotid.
  - More infections = more damage to gland and duct.
  - ➔ ***Pathophysiology and Treatment:***
    - Obstruction of salivary flow.
    - **Intraductal calculus.**
    - Stricture.
    - Mucous plug.
    - Ductal papilla lesion.
    - Extrinsic compression.
    - No consistent Tx.
    - Tympanic neurectomy.
    - Duct ligation.
    - Gland excision.

- **Sialolithiasis:** (stone in salivary glands).
  - Formation of hardened intraluminal deposits in the ductal system
  - Common with chronic sialoadenitis
  - Causes:
    - Stagnation of saliva.
    - Focus for formation from duct injury.
    - Biological factors (calcium salts).
  - Location:
    - 80% Wharthon's duct "of submandibular gland".
    - 19% Stenson's.
    - 1% Sublingual.
    - ➢ Why Wharthon's?
      - Alkaline and Viscous saliva.
      - Increased Ca and Phos.
      - Angulation of the duct at Mylohyoid.
      - Vertical orientation at the distal segment.
  - ➔ ***Symptoms and Management:***
    - Colicky postprandial pain "diagnostic".
    - Swelling.
    - Plain films.
    - Sialography.
    - CT "to evaluate size and site of the stone".
    - If the stone is small we treat it medically and observe (drink a lot of water), if large we treat it surgically.
    - Like sialoadenitis.
    - Avoid vigorous probing.
    - Incise duct orifice.
    - Stenting.
    - Surgical excision.

# Salivary Gland Neoplasms

- **Diverse histopathology**
  - Determines Aggressiveness.
- **Relatively uncommon**
  - 2% of head and neck neoplasms.
- **Distribution**
  - 95% in adults.
  - Parotid: 80% overall; 80% benign.
  - Submandibular: 15% overall; 60% benign.
  - Sublingual/Minor: 5% overall; 40% benign.

**Rule of 80%:**
80% of tumors is parotid.
80% of parotid tumors is benign.
80% of them is pleomorphic adenoma.

- **Benign** tumors are a mobile, non-tender and Asymptomatic except for the mass. While **Malignant** tumors are Rapid growth, skin fixation, cranial nerve palsies, painful and fixed.
- Benign salivary gland management is surgery. Why? because there is 5-10% probability of becoming malignant.
- Malignant tumors may involve lymph nodes (evidence of local metastasis) and/or facial
- paresis/paralysis. (fast growing tumor and pressure symptoms depends on the site).
- **Diagnostic tests: (CT first then FNA)**
  - Open excisional biopsy (submandibulectomy or parotidectomy) preferred. ➔ CT/MRI – deep lobe tumors, intra vs. extra-parotid.
  - **FNAB**: (Shown to reduce surgery by 1/3 in some studies).
    - ❑ Delineates intraglandular lymph node, localized sialadenitis or benign lymphoepithelial cysts.
    - ❑ May facilitate surgical planning and patient counseling.
    - ❑ Accuracy >90% (sensitivity: ~90%; specificity: ~80%).
- **Treatment** is generally via adequate surgical resection with neck dissection for node-positive necks and radiation. **Be prepared for total parotidectomy with possible facial nerve sacrifice.**
- **Most common parotid tumors:**
  - **Benign:**
    - — Pleomorphic Adenoma.
    - — Warthin tumor.
  - **Malignant:**
    - — Mucoepidermoid Carcinoma (MEC).
    - — Adenoid Cystic Carcinoma.

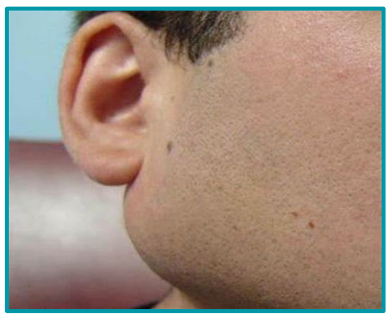
Rule of size; the bigger the size of the tumor the higher probability of it being benign, but any parotid mass should be excised even if it was benign BC.:
1. FNA is not accurate in salivary glands.
2. Malignant transformation possibility 5-10%.
3. Cosmetic purposes.

## ◄ Pleomorphic adenoma:

- Most common benign tumor of salivary glands.
- It can arise from the parotid (mainly), submandibular or minor salivary glands.

➔ **Presentation:**
- Slow growing, usually seen in the third or fourth decade, with propensity to females.
- Encapsulated, pseudopods (indicate full gland excision, don't just remove the tumor, you have to remove the whole lobe or gland to prevent its recurrence).

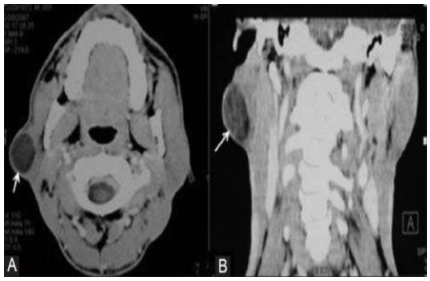
➔ **Treatment:** surgery



| | |
|---|---|
| **Warthin's tumor** | • Papillary Cystadenoma Lymphomatosum.<br>• 6-10% of parotid neoplasms.<br>• Older, males.<br>• 10% bilateral; 20% multicentric.<br>• 3% with associated neoplasms.<br>➔ **Presentation:** Slow-growing, painless mass in parotid tail.<br>➔ **Treatment:** surgery |

# Salivary Gland Neoplasms

## ◀ Mucoepidermoid carcinoma:



- Most common salivary gland malignancy.
- Can invade the facial nerve. → Facial paralysis
- Slow growing.
- 5-9% of salivary neoplasms, Parotid 45-70% of cases, Palate 18%.
- 3rd-8th decades, peaks in 5th decade, Females more than males.

➔ **Presentation:**

- Low-grade: slow growing, painless mass.
- High-grade: rapidly enlarging, +/- pain.
- Minor salivary glands: may be mistaken for benign or inflammatory process.

➔ **Treatment:** surgical excision

- Influenced by site, stage and grade.
- Low-grade tumors: complete resection by parotidectomy.
- High-grade tumors: parotidectomy, neck dissection and radiotherapy.

| | |
|---|---|
| **Adenoid cystic carcinoma** | • Overall, 2nd most common salivary gland malignancy and 2nd most common of the parotid.<br>• Most common in submandibular, sublingual and minor salivary glands.<br>• Males=Females (5th decade).<br>➔ **Presentation:** Asymptomatic enlarging mass.Pain, paresthesias, facial weakness/paralysis.<br>➔ **Treatment:**<br>• Complete local excision.<br>• Tendency for perineural invasion; facial nerve sacrifice.<br>• Post-op *Neutron Beam XRT.* |

## ◀ Lichen Planus:


- chronic inflammatory and immune-mediated disease that affects the skin, nails, hair and mucous membranes. It is a premalignant condition.
- characterized by polygonal, flat-topped, violaceous papules and plaques with overlying, reticulated, fine white scale (Wickham's striae)
- Commonly affecting dorsal hands, flexural wrists and forearms, trunk, anterior lower legs and oral mucosa → patients usually present to dermatology
- Punch biopsy if suspected or to confirm the diagnosis
- Rx: topical steroids

# Congenital masses

## ◄ Thyroglossal duct cyst:

- Most common congenital neck mass (70%)
- 50% present before age of 20
- Midline (75%) or near midline (25%)
- Usually just inferior to hyoid bone (65%)
- Cystic midline swelling (Anywhere on the midline).
- Affecting young children but can occur at any age.
- Increase in size with URTI.
- +/- Sinus. Can present with sinus and discharge (infective).
- Moves with tongue protrusion or swallowing because of its attachment to the foramen cecum. In embryology thyroid descends through foramen cecum and the duct in between the hyoid bone, after descending the duct will atrophies. But in this case the duct persists (imp to understand the management).

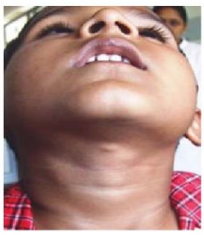


Fig. 1: Thyroglossal cyst in a 7-year-old boy

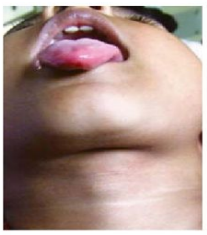
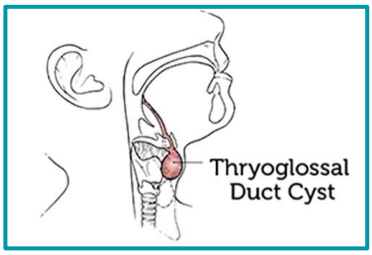


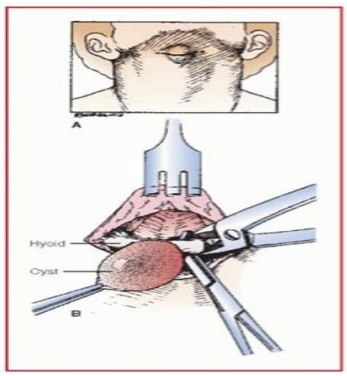
Fig. 2: Thyroglossal cyst puckering with protrusion of the tongue

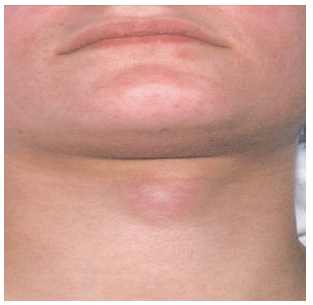


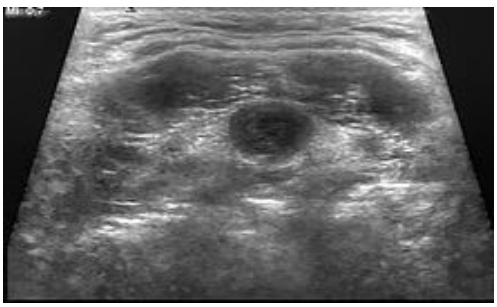

- It may contain the only functioning thyroid tissue. Do US (to check thyroid) and thyroid function test.
- Rarely malignant, <1%.
- Investigations: Ultrasound (to evaluate cyst and thyroid).

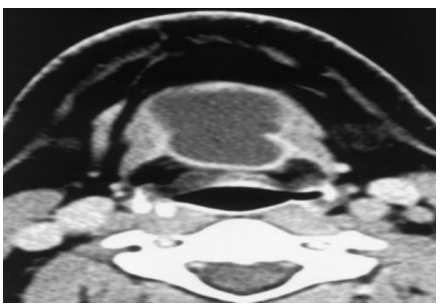
➔ **Treatment:**

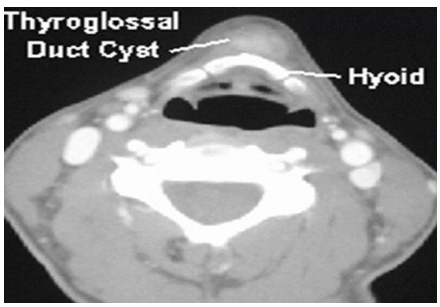
after resolution of any infection; Surgical excision including the body of hyoid bone and core of tongue tissue to prevent recurrence **Sistrunk's procedure** excise the cyst with body(central part) of hyoid bone.



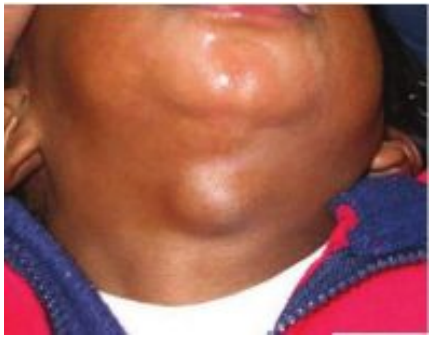






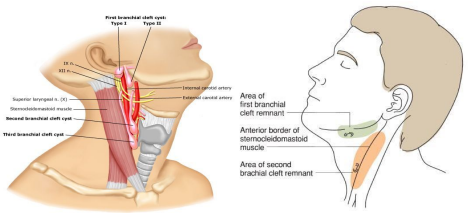

## ◄ Dermoid/epidermoid cyst:

- Cystic mass resulting from congenital epithelial inclusion or rest.
- Epidermoid: epithelial elements only, fluid content.
- Dermoid: epithelial elements plus dermal substructure (hair, tooth, sebaceous glands).
- Typically seen in the midline of the neck, usually in the submental region (important). It is a ddx of midline mass.
- *Treatment* is complete surgical excision.

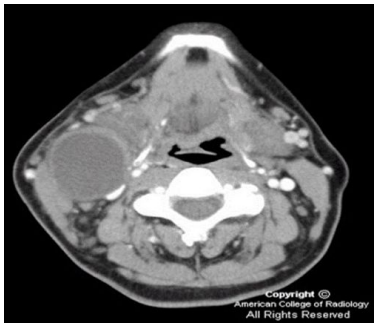


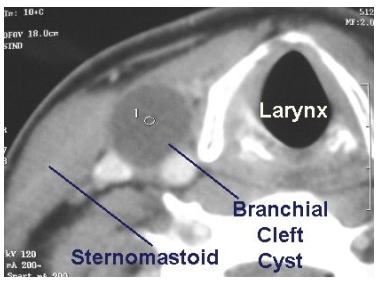
# Congenital masses

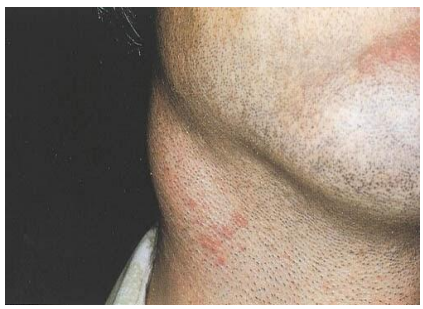
## ◀ Branchial cyst:



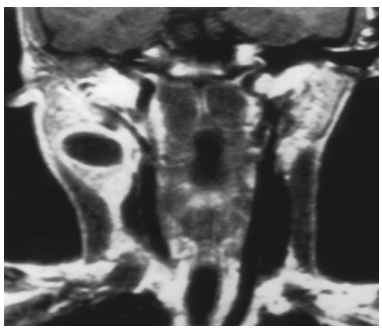

- Common in the second decade of life.
- Lateral swelling in the upper part of the neck attention to SCM (Level 2).
- Anomalies on the second branchial arch are the most common.
- May be associated with a sinus or fistula. —> you have to excise it completely.
- A second arch branchial sinus has an external opening at the junction of the lower and middle third of the anterior border of SCM and may excrete mucoid discharge , it may have internal opening in the tonsillar fossa
- Present in older children or young adults often following URI.
- 2nd cleft most common (95%) – tract medial to XII nerve between internal and external carotids.
- 1st cleft less common – close association with facial nerve possible.
- 3rd and 4th clefts rarely reported.
- Most common as smooth, fluctuant mass underlying the SCM.
- Skin erythema and tenderness if infected.
- CT is the investigation of choice for a lateral mass.
- **Treatment:** Initial control of infection. Surgical excision, including tract. May necessitate a total parotidectomy (1st cleft).



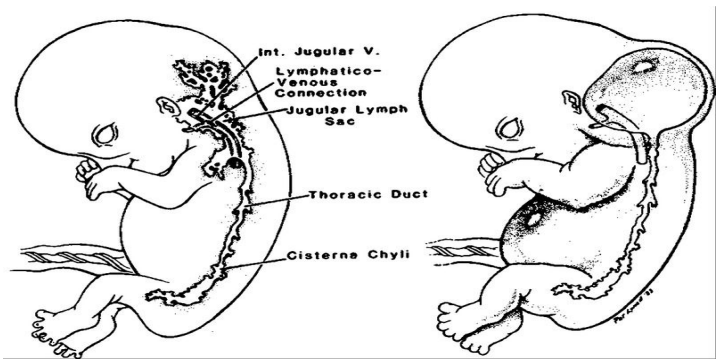



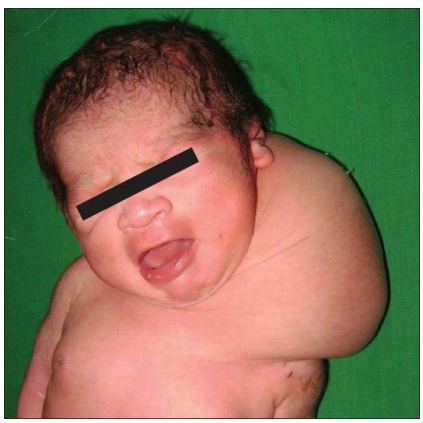
Pt. w/ upper neck mass exacerbated URTI on examination you find a soft mass in Level 2 Upper and Lateral, CT/MRI shows cystic mass (typical for Branchial Cyst).



## ◀ Cystic hygroma:

- Occurs most commonly in the posterior triangle of the neck (mostly in Level 5).
- Arises from Obstruction or Sequestration of jugular lymph sac.
- Seen in neonate, early infancy or childhood.
- May cause difficulty in labor (C-section, immediate intubation & tracheotomy), exit procedure.
- Soft, cystic and partially compressible.
- **Treatment** is surgical excision for septic hygroma.

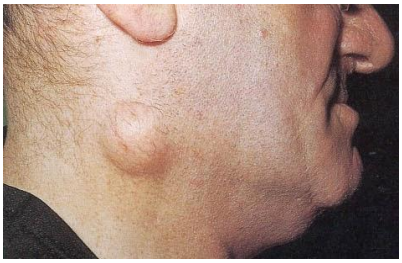


# Congenital masses

## ◀ Sebaceous cyst:

- Older age group.
- Clinical diagnosis:
  - Elevation and movement of overlying skin
- **Treatment:** Excision.

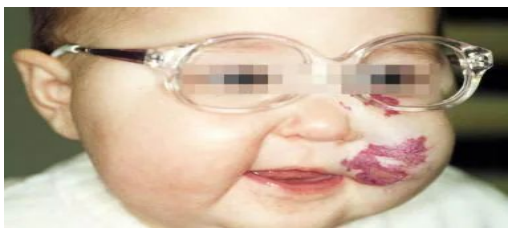


Which level ? level II
Give 1 DDX : branchial cyst
What you do ?
1. Give empirical therapy for 10 days
2. If didn't disappear, do CT than FNA

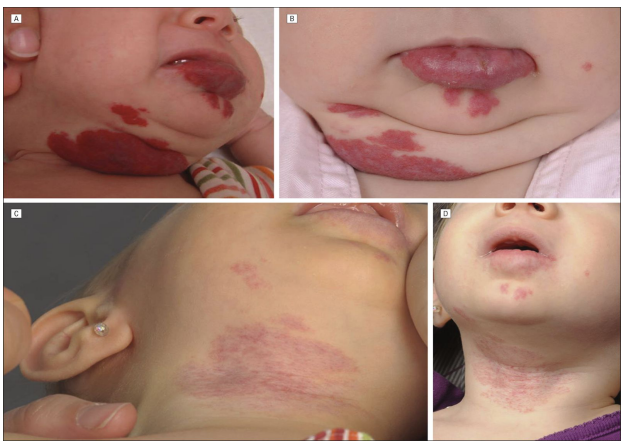
# Vascular masses

## ◀ Hemangioma:

- Congenital hemangioma present at birth.
- **Infantile hemangioma** start to appear in the first 4 weeks of life, early rapid growth, plateau then involution.
- GLUT-1.
- Markers of hemangioma proliferation: VGEF, urinary beta-fibroblast growth factor, urinary matrix mettaloprotineage MMP.
- MRI is the investigation of choice.
- Management (depends on the symptoms): Observation (if not symptomatic), Surgical excision (if affecting the eye or causing airway obstruction), Tracheostomy (to secure the airway), Propranolol (new treatment of choice if not causing symptoms).



If a patient comes with skin lesions (like in the images) + stridor → rule out subglottic hemangioma because 50% of patients with skin (cutaneous) hemangioma also have subglottic hemangioma

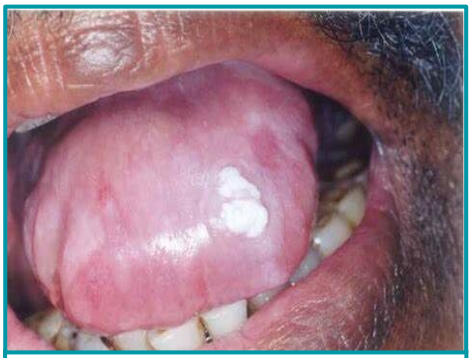


In conclusion:
- Neck masses are common and most often due to lymphadenopathy secondary to self-limited infection or inflammation
- A basic knowledge of neck anatomy is required
- Thorough history and physical examination usually suggests a diagnosis
- Appropriate investigation should be performed by specialist and managed accordingly

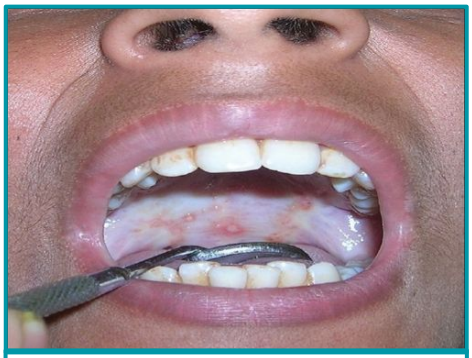
# Premalignant oral cavity lesions

## ◀ Oral Submucous Fibrosis (OSMF):

- OSMF is a high risk precancerous condition that predominantly occurs among indians, uncommon in KSA.
- **Factors implicated in the pathogenesis of submucous fibrosis:**
  - Chilly consumption.
  - Betel-nut chewing.
  - Genetic predisposition.
- OSMF is a chronic mucosal condition affecting any part of the oral mucosa.(usually hard palate)
- Mucosal rigidity of varying intensity due to fibroelastic transformation of juxta epithelial connective tissue layer.
- The presence of **palpable fibrous bands is a diagnostic criterion** for submucous fibrosi (clinical diagnosis).
- When the tongue is affected, it is devoid of papillae and its mobility, especially the protrusion is impaired (it'll be pale).
- The opening of the mouth is restricted (even if not malignant).
- In severe OSMF, the patient cannot protrude the tongue beyond the incisal edges and there is a progressive closure of the oral opening.
- **The most serious aspect of this disease is the high risk for the development of oral cancer.**
- The epithelium is atrophic in this condition which renders it susceptible to the action of carcinogens.
- **Treatment:**
  - Some temporary relief from the symptoms and improvement in the oral opening with medicinal treatment such as local injections of cortisone.
  - It's essential to follow-up the patients regularly due to the risk of malignancy.
  - Patient education to discontinue the use of Betel-nut and tobacco in any form.



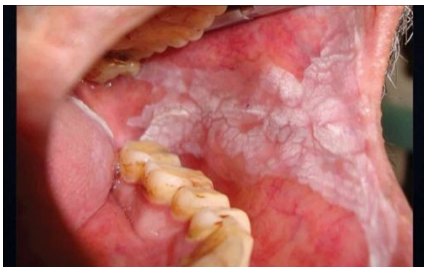
Pics in exam: Pale and fibrosis. No papillae



Hard palate: trismus & inability to open the mouth.

# Premalignant oral cavity lesions

## ◄ Leukoplakia:



- Leukoplakia is the **most common premalignant** or "potentially malignant" lesion of the oral mucosa (buccal mucosa).
- It's predominantly white lesion of the oral mucosa.
- Differentiated from other benign lesions by **inability** to scrape away the lesion.
- In general the reported prevalence ranges from 0.2% to 5%.
- It's seen most frequently in middle-aged and older men.
- Men are more affected in some countries. Because of smoking and alcohol.

### ➔ Presentation:

- Can be either Solitary or Multiple.
- May appear on any site of the oral cavity.
- Common sites being: **buccal mucosa** (most common), alveolar mucosa, floor of the mouth, tongue, lips and palate.

### ➔ Classically two clinical types of leukoplakia are recognized:

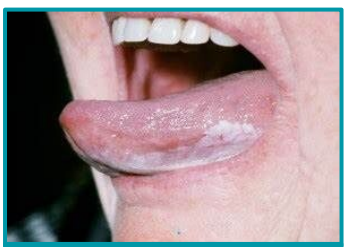
- **Homogenous Leukoplakia** is defined as a predominantly white lesion of uniform **flat** and **thin** appearance that may exhibit shallow cracks. This type is usually asymptomatic.
- **Non-homogenous Leukoplakia** has been defined as a predominant white or white-and-red lesion **"erythroplakia"** that may be either irregularly flat, nodular **"speckled leukoplakia"** or exophytic **"exophytic or verrucous"** more risky (associated with malignancy).

### ➔ Risk factors:

Non-homogenous, irregular red (dangerous)

- **Smoking**.
- **Alcohol**.
- Inadequate diet, Vitamin deficiency, e.g. Vit A and C.
- Areca nut (betel) chewing.
- Chronic traumatic irritation. (Dental)
- Poor oral hygiene.
- Poor socioeconomic status.

### ➔ Treatment:

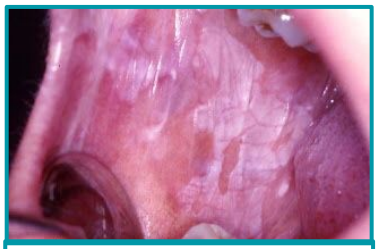


Homogenous, lateral part: whitish and superficial.

- Risk of malignant transformation isn't completely eliminated by any of the current therapies (bc the whole area is prone ➔ so follow up is necessary ).
- Initial treatment of a white oral lesion is the elimination of the possible aetiological factors. (Stop smoking, alcohol, and betel nut).
- **Complete surgical removal (leaving free-lesion borders)** is recommended in cases with epithelial dysplasia (to make sure everything is removed).
- Apart from the surgical excision, other treatment modalities available include cryosurgery, laser surgery, retinoids, beta-carotene, bleomycin, calcipotriol, photodynamic therapy. Biopsy to r/o carcinoma.

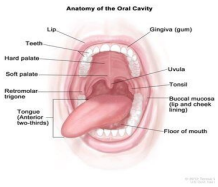
### ➔ Prognosis:

- The malignant transformation rate of oral leukoplakia varies from 0% to 33%.
- **Regular check-up of these patients is essential**, probably every 3, 6 and then 12 months, both in treated and untreated patients.



(Describe the picture) Predominant white lesion of the oral mucosa (leukoplakia), from 437.

# Oral Cancer




- Squamous cell carcinoma is the most common.
- Tobacco and alcohol have synergistic effect (major risk factor).
- Treatment of early oral cancer is surgery. (More than chemo and radiation)
- Locally advanced T3/4 are best treated with combined Surgery and Radiotherapy.
- **High risk of second primary cancer** (tongue, thyroid, laryngeal, etc..)
- for example, there could be primary tongue cancer in addition to primary buccal mucosa cancer, therefore ruling out other oral cancers after making the diagnosis is essential.
- The oral cavity extends from vermilion border of the lips to the plane between junction of the hard palate and the soft.
- Includes: lips and oral cavity (buccal mucosa, tongue, gingiva, retromolar trigone, floor of the mouth, hard palate).

## ➔ Presentation:

Non healing ulcers, Induration, Verrucous/Cauliflower, Hot potato chewing, Trismus (lockjaw, due to invasion of mastication muscles), LN enlargement (neck swelling).

## ➔ Pathology:

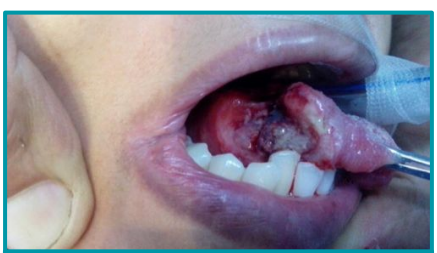
- **90% SCC** (squamous cell carcinoma): Well/Moderate/Poorly/Undifferentiated (affects prognosis).
- Exophytic, Ulcerative, Infiltrative, Verrucous.
- Other malignancies; Adeno Car / from malignant minor salivary gland tumors, melanoma, sarcomas.
- Premalignant lesions: Leukoplakia, hyperplasia, Erythroplakia, and dysplasia.
- Regional Lymph node metastasis related to size and thickness of primary tumor (the larger the more prone to lymph node metastasis).

## ➔ Risk factors:

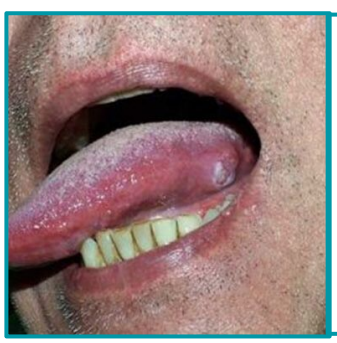
- **Heavy tobacco consumption**.
- **Alcohol**.
- Syphilis.
- Viruses (EB (nasopharyngeal), HSV, HPV, HIV).
- Neglect of oral dental hygiene (chronic infection, unfit dentures) irritation.
- Lichen planus, **Plummer Vinson syndrome**.
- Immunosuppression, malnutrition.

## ➔ Diagnosis:

- **Clinical*:*** History, detail clinical examination (use headlamp and mirror), Bimanual palpation (to know the depth of invasion in tongue cancer, very important) Cervical lymph node examination (to rule out metastasis to the neck).
- **Endoscopy:** examining other areas of the head and neck to rule out second primary, (very important).
- **Biopsy:** prove the diagnosis (most commonly SCC).
- **Staging:** CT with contrast, MRI (especially with tongue cancer), PET scan (to rule out metastasis to lung, live and bone).



Ulcerative, looks malignant, squamous carcinoma.



There are leukoplakia changes involving the tongue, squamous carcinoma.

# Oral Cancer

## ➔ Treatment:

- Goals:
  - To eradicate of the primary tumor and LN metastasis (we remove with premargin).
  - To maintain the function (reconstruction).
  - Cosmetic reconstruction (regional flap or thigh flap).
- Factors affecting choice of treatment:
  - Tumor factors.
  - Patient factors.
  - Resource factors. (What the hospital can provide)
- **Surgery:** Addressing the tumor, neck (LN metastasis, to check neck metastasis for possible radical neck dissection), reconstruction and secure the airway to make sure it's safe (because oral cavity tumors are bulky, we sometimes do a tracheostomy for a few days until the edema subsides).
- Radiotherapy.
- Chemotherapy.
- Concomitant, Radio+Chemotherapy.

} If there are free margins

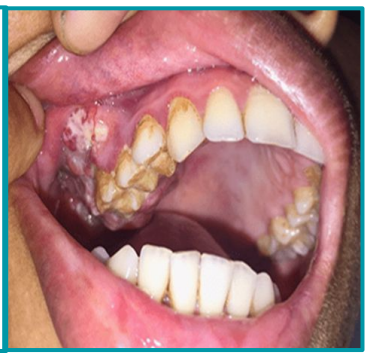
- Palliative Chemotherapy for advanced diseases.

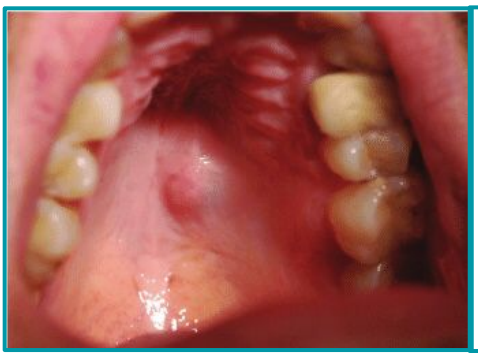
**Treatment methods depends on TNM stage:** (Tumor size, spread to Nodes and Metastasis).
**Stage 1, 2: single modality.** (Surgery or radiotherapy)
**Stage 3, 4: double modality.** (Either Surg. & Radiation or Radiation & Chemotherapy).

## ➔ Prognosis:

- Location/thickness/depth of primary tumor.
- Staging depends on early or late.
- Type of histology.
- Grading.
- Presence of perineural spread.
- Mandibular invasion (we might have to do mandibulectomy).
- LN extension (Level, size, extracaps of meta).
- Metastasis.

Fungating mass involving the alveolar ridge, extending to the buccal mucosa and maybe the maxillary bone, looks malignant, squamous carcinoma.



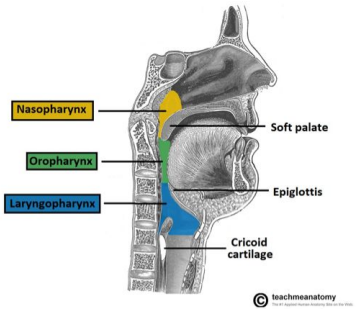


Hard palate, mucosa is intact, minor salivary glands tumor.
This is a submucosal hard palate lesion and the most common type in this case is pleomorphic adenoma, unlike other oral cancers where SCC is more common.

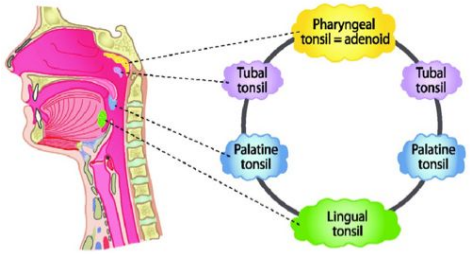
**Extra from 437**

- **For a patient with suspected oral cancer, management step-by-step:**
  1. **History & Examination** inc. neck exam for metastasis.
  2. **CT with contrast**.
  3. **MRI** if tongue is involved, very important.
  4. **Biopsy**.
  5. **TNM staging** (tumor size, nodes involves, metastasis to other regions is ruled out through CT CAP).
  6. Present the case to the **tumor board** to decide the management.

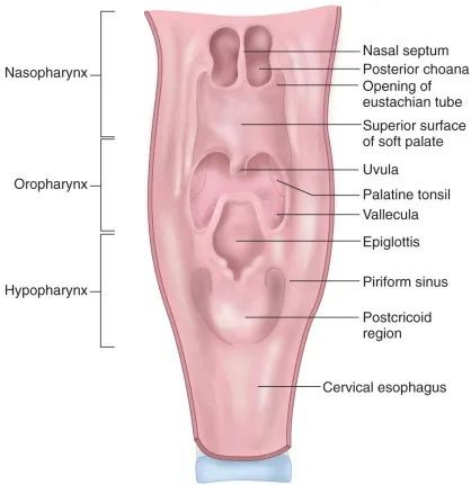
# The Pharynx - Anatomy




- It is 12-14 cm long , extending from base of the skull (basiocciput and basisphenoid) to the lower border of cricoid cartilage where it becomes continuous with the esophagus.
- The width of pharynx is 3.5 cm at its base and this narrows to 1.5 cm at pharyngo-esophageal junction which is narrowest part of digestive tract apart from the appendix.
- It is divided into 3 anatomic regions:
  - Nasopharynx
  - Oropharynx
  - Hypopharynx

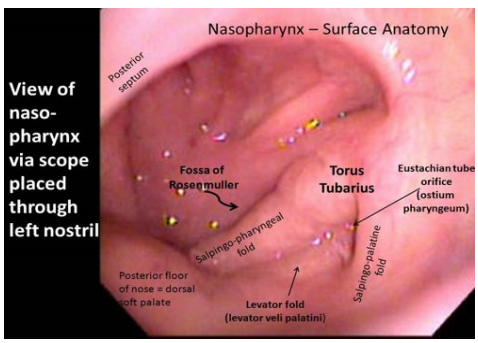


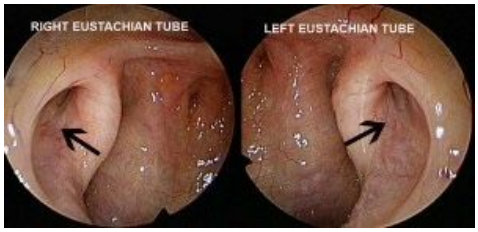

- **Structures of the pharyngeal wall:** (From within outwards it consists of four layers: Mucous membrane)
  - Pharyngeal aponeurosis
  - Muscular coat
  - Buccopharyngeal fascia
- **Waldeyer's Ring:** (lymphoid tissue)
  - Adenoids.
  - Palatine tonsil.
  - Lingual tonsils.
  - Tubal tonsils (in fossa of Rosenmuller; common site for nasopharyngeal carcinoma).
  - Lateral pharyngeal bands.
  - Nodules (in posterior pharyngeal wall) enlarge in case of allergy.




## ◄ Nasopharynx (Epipharynx):

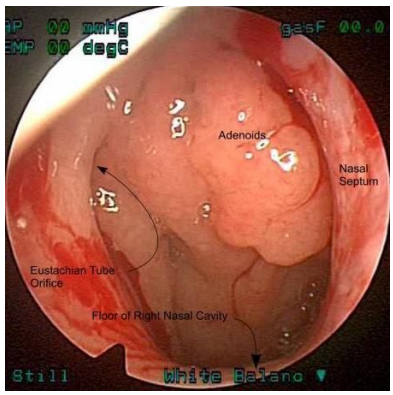
- It lies behind the nasal cavities and extends from the base of skull to the soft palate or the level of the horizontal plane passing through the hard palate.
- It is lined by pseudostratified ciliated columnar epithelium
  - ➔ **Roof:** basisphenoid and basiocciput.
  - ➔ **Posterior:** prevertebral muscles and fascia. In case of cancer it will invades the muscles and skull.
  - ➔ **Floor:** soft palate.
  - ➔ **Anterior wall:** posterior choanae.
  - ➔ **Lateral wall:** ET.
- Opening of eustachian tube situated 1.25 cm behind the posterior end of inferior turbinate
- Above and behind the tubal elevation is a recess called fossa of Rosenmuller which is the commonest site for origin of carcinoma
- Cancers in the fossa of Rosenmuller can grow & compress the ET → ET obstruction → unilateral otitis media with effusion (so in cases of unilateral OM with effusion, especially in smokers, always rule out nasopharyngeal tumors by doing nasal endoscopy)



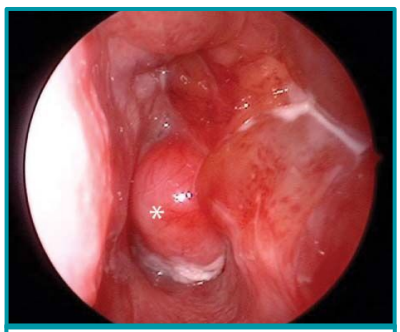
# Pharynx

## ◀ Nasopharynx (Epipharynx):




- The most common presentation for nasopharyngeal cancer is a neck mass with unilateral otitis media with effusion)
- **Nasopharyngeal tonsil (adenoid):**
  - It is a subepithelial collection of lymphoid tissue.
  - It increases in size up to the age of 6 years and then gradually atrophies. May cause sleep apnea and snoring.
- **Lymphatic drainage:**
  - Drain into upper deep cervical nodes either directly or indirectly through retropharyngeal and parapharygeal lymph nodes.
  - They also drain into spinal accessory chain of the nodes in the posterior triangle of the neck.

## • Nasopharyngeal Fibroma (Juvenile Nasopharyngeal angiofibroma):



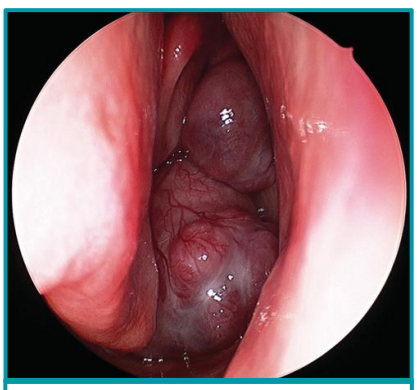
This is a surgical view in a pediatric patient. The adenoids look benign, lobulated & are not compressing the gradually atrophies eustachian tube)

- It is a rare tumor, though it is the commonest of all benign tumors of nasopharynx.
- The exact cause is unknown.
- Adolescent males (doesn't come in females).
- Example Q: 15 year old male, presented with left recurrent epistaxis, what is the DDx? Juvenile nasopharyngeal angiofibroma.
- Such patients have a hamartomatrous nidus of vascular tissue in the nasopharynx and this is activated to form angiofibroma when male sex hormone appears. Theory; that's why in adolescents.

➔ **Site of origin and growth:** Arise from the posterior part of nasal cavity close to the superior margin of sphenopalatine foramen.

➔ **Pathology:**

- Made up of vascular and fibrous tissues.
- Mostly, the vessels are just endothelium-lined spaces with no muscle coat → no muscle so no contraction to stop the bleeding causing heavy epistaxis.
- Extensions of nasopharyngeal Fibroma.
- **Benign.**
- **Locally invasive.** Even after treatment.



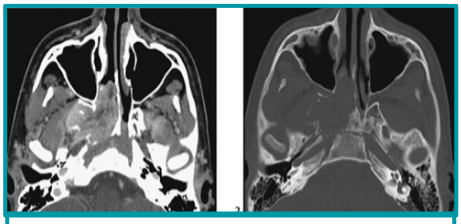
Vascular mass.

➔ **Clinical features:**

- Age and sex(male 10-20 years).
- Profuse and recurrent epistaxis (exam scenario).
- Progressive nasal obstruction and denasal speech.
- Conduction hearing loss and serous otitis media because ET is obstructed.
- Mass in the nasopharynx nasal cavity.

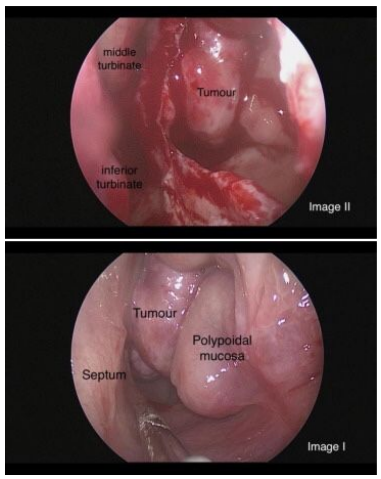
# Pharynx

## • Nasopharyngeal Fibroma (Juvenile Nasopharyngeal angiofibroma):



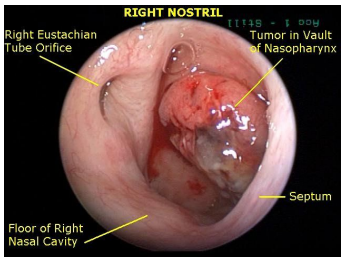
Bone destruction

➔ **Investigation:**
- Soft tissue lateral film of nasopharynx.
- X-rays of paranasal sinuses and base of skull.
- CT scan of the head **with contrast** (bc it is vascular) enhancement is now the investigation of choice.
- MRI (indicated if we suspect skull base involvement/intracranial extension).
- Carotid angiography.
- Biopsy Avoided (bleeding risk & difficult to perform).




➔ **Treatment:**
- **Surgical excision** is now the treatment of choice.
- Endoscopic (if small) vs open approach (if large and invasive).
- Pre op Embolization to reduce bleeding (24 - 48 hrs).
- Recurrence is possible.

## • Nasopharyngeal malignant tumors:




- Chinese and asians are more prone than other ethnicities due to genetic predisposition.
- Associated with Epstein-Barr virus. Smoking and alcohol are also risk factors.

➔ **Pathology:**
- **Squamous cell carcinoma (most common).**
- Lymphomas.
- Rhab-domyosarcoma, malignant mixed salivary tumour or malignant chordoma.(rare)

➔ **Clinical features: neck mass + nasal obstruction = nasopharyngeal malignancy**
- **Nasal obstruction.**
- **Unilateral Otitis Media with Effusion.**
- Nearly all the cranial nerves may be involved when extension so examine them all.
- Jugular foramen syndrome.
- Cervical lymphadenopathy (most common) (60-90%) neck mass.

➔ **WHO CLASSIFICATION:** These types have also been correlated to titres of Epstein-Barr(EB) virus and also to response to radiotherapy.

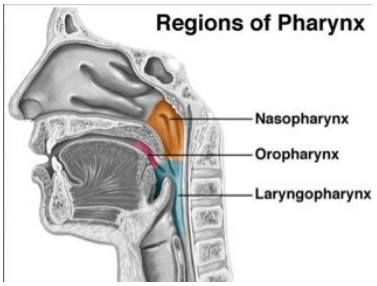
➔ **Diagnosis:**
- Biopsy if non vascular.
- CT scan with contrast. (For any head & neck cancer)
- MRI (if expecting skull base invasion/intracranial extension).
- Bone scan (to rule out metastasis).
- TNM staging.

➔ **Treatment:** chemoradiation (main therapy, response very well), salvage surgery.

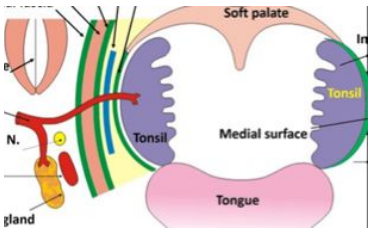
**IMPORTANT**: For elderly patients presenting with unilateral otitis media with effusion or unilateral conductive hearing loss, rule out nasopharyngeal cancer (examine nasopharynx to make sure no tumor is compressing ET) Alarming sign.

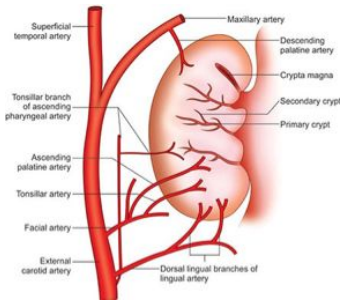
# Pharynx

## ◄ Oropharynx:




- extends from the plane of hard palate above to the plane of hyoid bone.
- **Boundaries of oropharynx:**
  - It is related to retropharyngeal space and lies opposite the second and the upper part of the third cervical vertebrae.
    1. Base of tongue, posterior to circumvallate papillae.
    2. Lingual tonsils.
- **Palatine tonsil:**
  - are a collection of lymphoid tissue present in the submucosa of the oropharynx.
  - Located in the tonsillar fossa , one on each side.
  - Blood supply:
    - Tonsillar artery a branch of the facial artery.
    - External carotid.
    - Lingual artery.
    - Maxillary artery.
  - Lymphatic drainage: jugulodigastric lymph nodes.

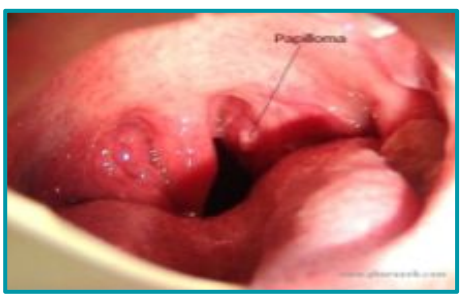


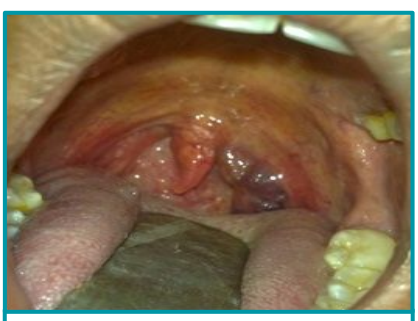




- **Boundaries of tonsillar fossa:**
  - Anterior: palatoglossal arch.
  - Posterior: palatopharyngeal arch.
  - Inferior: dorsal surface of posterior 1/3rd of the tongue.
  - Lateral: lateral wall of the oropharynx (superior constrictor muscle).

## ● Benign tumors of the oropharynx:

- Papilloma: (HPV) It is usually pedunculated, arises from the tonsil, soft palate or faucial pillars.
- Hemangioma (rare) CT scan 1st, biopsy only if possible.
- Pleomorphic Adenoma.
- Ddx of midline lingual mass: common Q
  - Thyroglossal duct cyst.
  - Lingual thyroid (ectopic thyroid, didn't descend) mostly.



Hemangioma

# Pharynx

## Malignant tumors of the oropharynx:

➔ **Common sites of malignancy in the oropharynx:**

- Posterior one third (or base) of tongue. Vague symptoms (dysphagia, abnormal sensation so diagnosed late)
- Tonsil and tonsillar fossa. Present with pain and ulcers so diagnosed early)
- Faucial palatine arch, soft palate and anterior pillar.
- Posterior and lateral pharyngeal wall.

➔ **Subsites in the oropharynx:**

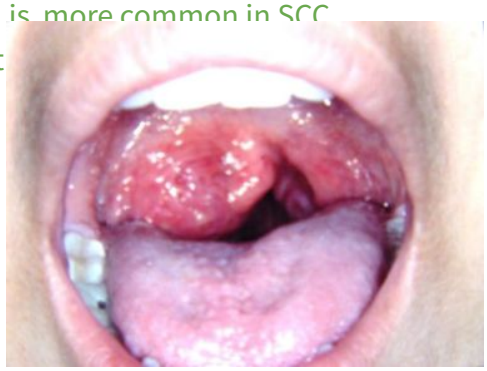
- Base of tongue.
- Tonsil, tonsillar fossa.
- Faucial arch.
- Pharyngeal wall.

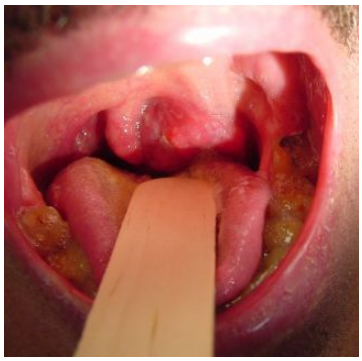
➔ **Histologically the tumor may be:**

- **Squamous cell carcinoma (the most common).**
- Lymphoepithclioma.
- Adenocarcinoma.
- Lymphomas.

## Carcinoma tonsil and tonsillar fossa:

- Squamous cell carcinoma is the most common and presents as an ulcerated lesion with necrotic base.
- Lymphomas in the tonsils may present as unilateral tonsillar enlargement with or without ulceration and may simulate indolent peritonsillar abscess (where they present with sore throat + asymmetrical tonsils - so take a biopsy of asymmetrical tonsils).
- Peritonsillar abscess differ: all area is red not only the tonsil, uvula deviated, and acute symptoms.
- ulceration is more common in SCC
- As if infect

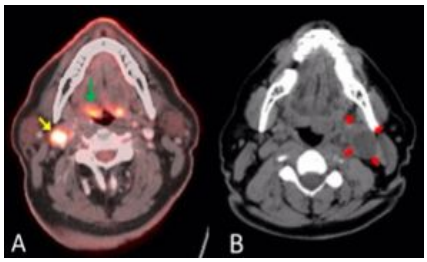




# Pharynx

## Carcinoma of posterior one-third or Base of tongue:

- The lesion remains asymptomatic for long time and patient presents when metastases in cervical nodes .
- Earlier symptoms (not clear symptoms) of sore-throat, feeling of lump in the throat (foreign body sensation)and slight discomfort on swallowing referred pain in the ear, dysphagia, bleeding from the mouth, and the change in the quality of speech. due to that, they usually present late/advanced stage.

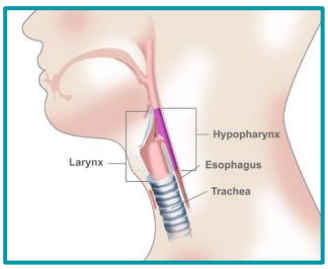



➔ **Diagnosis:**

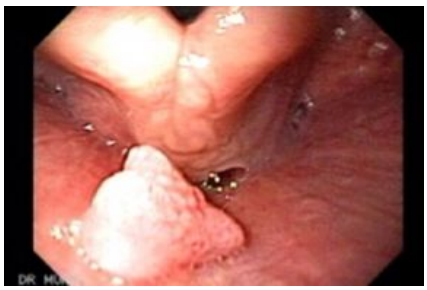
- Biopsy.
- CT scan with contrast.
- MRI.
- TNM staging. (Early stage single modality, late stage combined).

➔ **Treatment:** surgery, chemotherapy, radiotherapy, or combination.

## Hypopharynx:



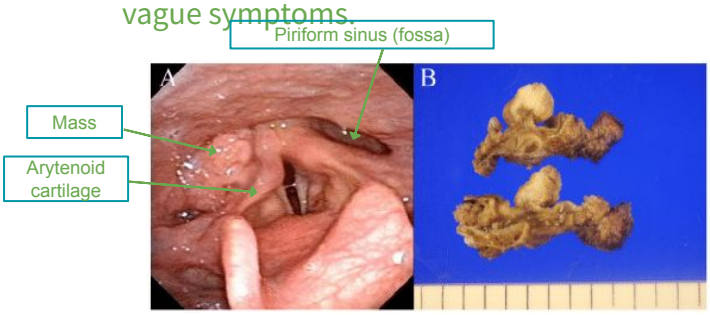

- Lowest part of the pharynx.
- Superior limit: the plane passing from the body of hyoid bone to the posterior pharyngeal wall.
- Inferior limit: lower border of the cricoid cartilage.
- **Subdivisions:**
  - Pyriform sinus (fossa).
  - Post-cricoid region.
  - Posterior pharyngeal wall.
- **Function:**
  - Common pathway for air and food.
  - Provides a vocal tract for resonance of certain speech sounds .
  - Helps in deglutition.

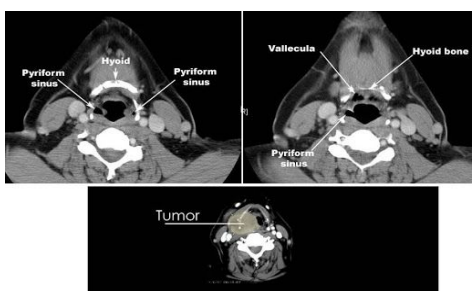


- Benign tumors of hypopharynx are uncommon.
- Malignant tumors involves various subsites:
  - Pyriform sinus.
  - Post-cricoid region (behind the cricoid).
  - Posterior pharyngeal wall.

## Carcinoma of pyriform sinus:

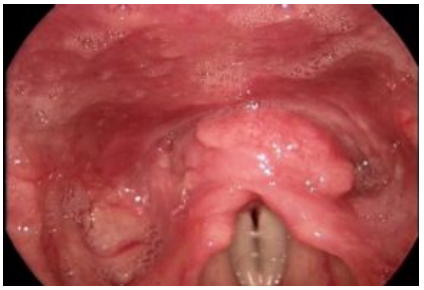
- Constitutes 60 % of all hypopharyngeal cancer.
- Mostly affecting males above 40 years of age.
- Metastatic neck nodes may be the first presentation they come late due to vague symptoms.



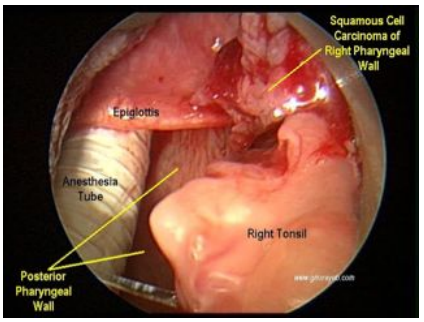
# Pharynx

## Carcinoma of post-cricoid region:common Q



- 30% of hypopharyngeal cancer.
- Associated with Paterson-Brown-Kelly (**Plummer-Vinson**) syndrome characterized by hypochromic microcytic anemia.
- Young female with dysphagia and iron deficiency anemia (rule it out).
- Plummer Vinson Syndrome Triad:
  - Hypochromic microcytic anemia.
  - Young female.
  - Carcinoma of post cricoid region.

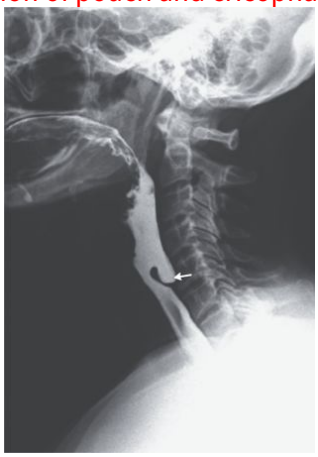
## Carcinoma of posterior pharyngeal wall:

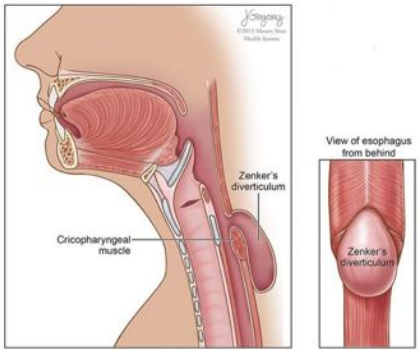



- Only 10% of hypopharyngeal cancer.
- Mostly seen in males above 50 years of age.
- Difficult to diagnose.

## Pharyngeal Pouch:

- Zenker's diverticulum (common in exams).
- Pulsion diverticulum where pharyngeal mucosa herniates through the Killian's dehiscence.
- Killian's dehiscence is a weak area between two parts of the inferior constrictor. above cricopharyngeal muscle.
- Cause is unknown.
- Due to spasm of cricopharyngeal sphincter or its uncoordinated contractions during the act of deglutition.
- It is usually seen after 60 years of age.
- CF: dysphagia, regurgitation of undigested food.
- **Investigation of choice:** Barium swallow.
- Rx excision of pouch and cricopharyngeal myotomy.

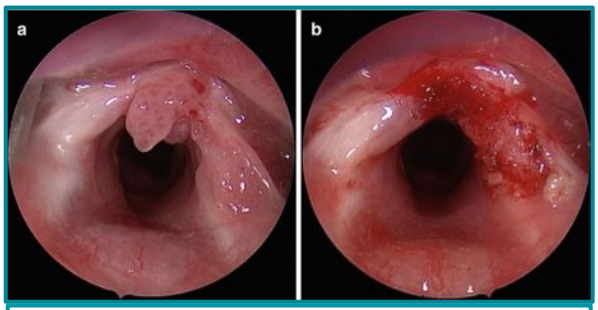




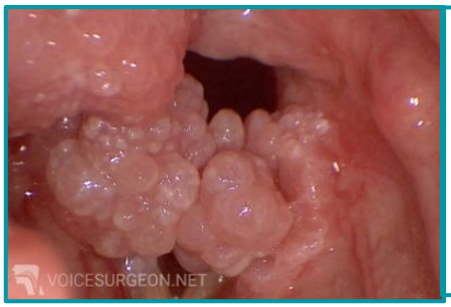
# Larynx

## ◄ Recurrent respiratory papillomatosis:common Q

- Recurrent growth of small, benign tumors or papilloma in the respiratory tract.
- Human papillomavirus (types 6,11).
- Rare malignant, the types causing malignancy are (16,18).
- Juvenile onset (less than 3 years: more aggressive & needs surgical debulking every 2-3 months), adult onset.
- Treatment: surgical debulking, Cidofovir.
  - When we do surgical excision, we try to avoid leaving raw areas in order to prevent scarring & webbing between the vocal cords. Which results in hoarseness and airway obstruction .
- Avoid tracheostomy if possible because it might cause seeding in the skin or lower airway).




It is involving anterior commissure




Treatment of choice: Debulking; cause airway obstruction in severe cases +/- Adjuvant Antiviral injection. grape like lesion extend from nose to lungs

## ◄ Laryngeal cancer:

- Divided to: Supraglottic, glottic (common), or subglottic.
- Male > female.
- Risk factors: smoking, alcohol, radiation.
- Presented early.

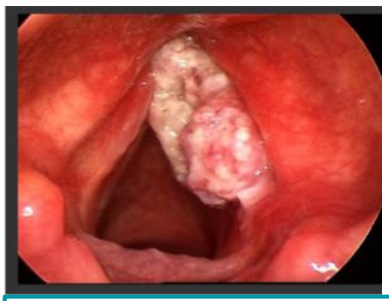
➔ **Diagnosis:**

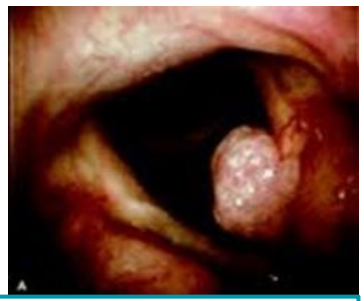
- History.
- Physical exam.
- CT and MRI.
- Biopsy.
- TNM staging.

➔ **Treatment:** surgery, chemotherapy, or radiotherapy (usually radiotherapy to preserve the voice and swallowing).

## ● Glottic cancer:

- Present early cause voice changes, we need to biopsy and order CT and MRI to rule out invasion to thyroid cartilage and gland





Aggressive fungating mass, extended

Extra

| | DDX | Risk Factors | Presentation | RX |
|---|---|---|---|---|
| **Sinonasal** | • Squamous cell carcinoma<br>• adenoid cystic carcinoma (minor salivary gland) | • Work related (chemical industry) | Neck mass<br>Unilateral symptoms | Surgery |
| **Oral** | • Squamous cell carcinoma<br>• adenoid cystic carcinoma (minor salivary gland) | • Smoking<br>• Alcohol<br>• **Dental Hygiene**<br>• Viral (HPV)<br>• **Trauma** | Neck mass<br>Unilateral symptoms | Surgery |
| **Pharynx** | • Squamous cell carcinoma<br>• adenoid cystic carcinoma (minor salivary gland) | • Smoking<br>• Alcohol<br>• **GERD**<br>• Viral (HPV) | Neck mass<br>Unilateral symptoms (Dysphagia) | Radiation (stage 1,2)<br>Chemo + Radiation (stage 3,4) |
| **Larynx** | • Squamous cell carcinoma<br>• adenoid cystic carcinoma (minor salivary gland) | • Smoking<br>• Alcohol<br>• **GERD**<br>• Viral (HPV) | Neck mass<br>Unilateral symptoms (Hoarseness) | Radiation (stage 1,2)<br>Chemo + Radiation (stage 3,4) |

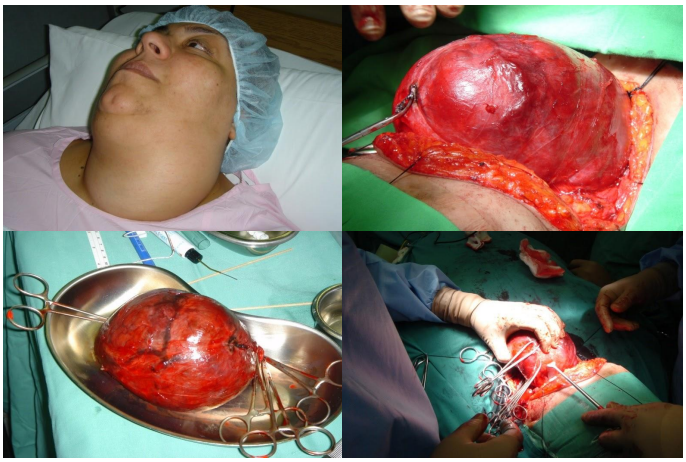
Note: TNM staging:
1,2 (Early): Surgery or Radiation
3,4 (Late): Surgery + Radiation or Chemo + Radiation

For Sinonasal and oral= choose surgical option
For pharynx and larynx= non-surgical

# Cases

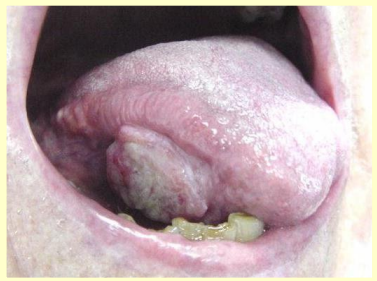
## Case 1:

- What is abnormal? Neck mass
- What is your DDx? 1- PTC 2- FTC 3- MTC
- What is the most likely Dx? PTC
- Work up 1- US 2- FNA 3- TFT 4- CT (huge)
- Management surgical

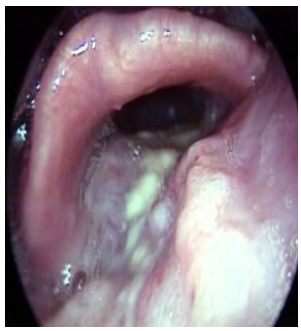


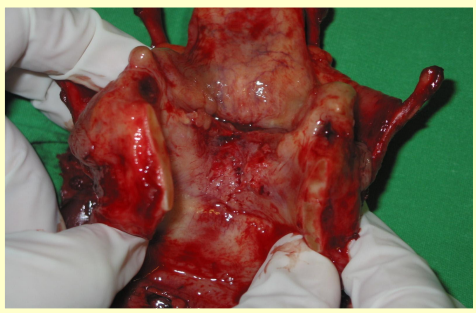
## Case 2:

- What is abnormal?
- What is your DDx? 1- SCC 2- ACC
- What is the most likely Dx? SCC
- Work up 1- CT 2- Biopsy
- Management
  1,2 stage: surgical
  3,4 stage: Surgery + Radiation



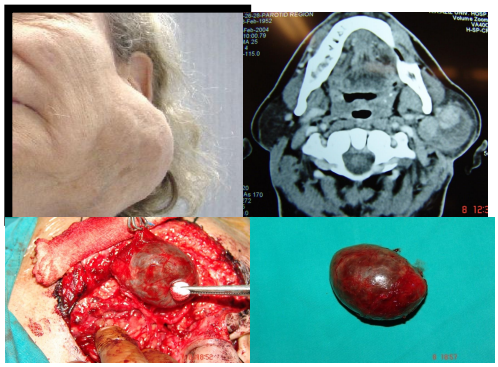
## Case 3:





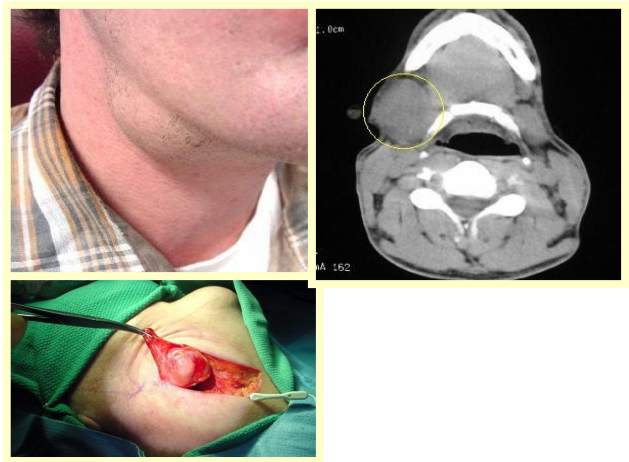
- 65 y old
- C/O : hoarseness X 10 Months
- Heavy smoker-2p/day X 40 years
- O/E :
  - hoarse voice
  - Mild stridor
  - Neck mass 5X4 CM
- Work up 1- CT 2- Biopsy
- Management
  1,2 stage: surgical
  3,4 stage: Chemo + Radiation

## Case 4:



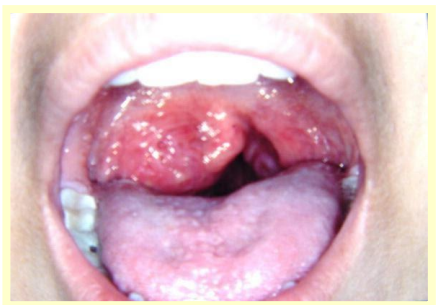
- What is abnormal? Parotid mass
- What is your DDx?
  1- Pleomorphic adenoma 2- MEC
- What is the most likely Dx?
  Pleomorphic adenoma
- Work up 1- CT 2- Biopsy
- What are the areas you should examine?
- Management Surgical
- Can we leave it?
  No, 1-chance of malignant transformation
  2 FNA not accurate 3- Cosmetic

## Case 5:



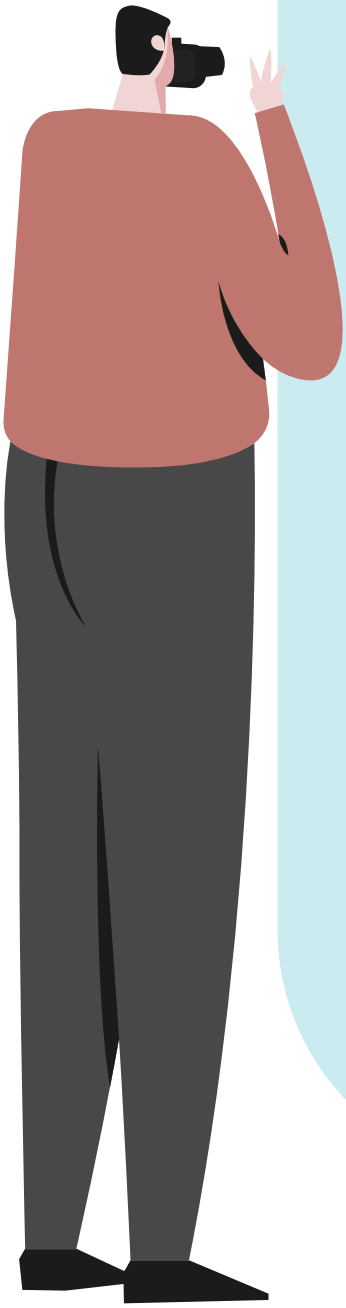
- What is abnormal?
  Mass underlying the SCM
- What is your DDx? Branchial cleft cyst
- What is the most likely Dx?
- Branchial cleft cyst
- Work up CT
- Management Surgical

## Case 6:



- What is abnormal?
  Unilateral tonsil enlargement
- What is your DDx? 1- SCC 2- ACC
  3-lymphoma
- What is the most likely Dx? SCC
- Work up 1- CT 2- Biopsy
- Management
  1,2 stage: surgical
  3,4 stage: Chemo + Radiation

# THANK YOU!

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