



# 432 Surgery Team

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## Common Neck Swellings



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COLOR GUIDE: • Females' Notes • Males' Notes • Important • Additional

# Outlines

## Common Neck Swellings

Anatomy of the Neck

Ranula

Dermoid cyst

Thyroglossal cyst

Branchial cysts

Laryngocele

Carotid body tumor

Hemangioma

Cystic Hygroma

Inflammatory lymphadenopathy

Malignant lymphadenopathy

Thyroid related abnormalities

Submandibular gland related abnormalities

Sjogren's syndrome





**Posterior cervical triangle:** The inferior belly of the omohyoid divides it into two triangles:

**-Occipital triangle:** The contents include the accessory nerve, supraclavicular nerves, and upper brachial plexus.

**-Subclavian triangle:** The contents include the supraclavicular nerves, Subclavian vessels, brachial plexus, suprascapular vessels, transverse cervical vessels, external jugular vein, and the nerve to the Subclavian muscle.

The main arteries in the neck are the common **carotids** arising differently, one on each side. On the right, the common carotid arises at the bifurcation of the brachiocephalic trunk behind the sternoclavicular joint; on the left, it arises from the highest point on arch of the aorta in the chest.

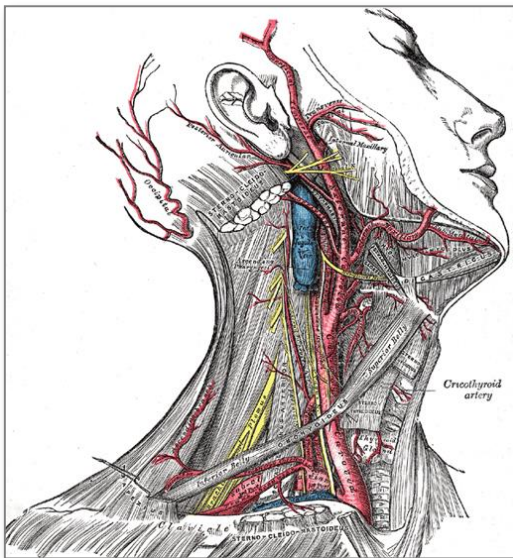
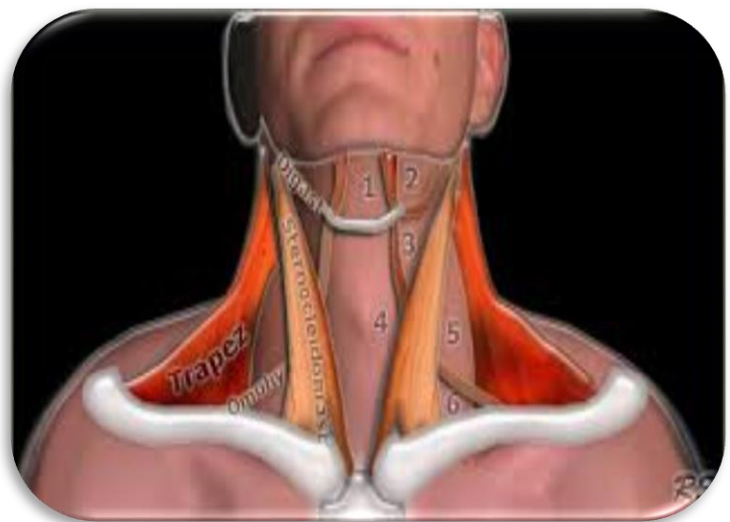


Figure 2: Dissection of the side of the neck showing the major arteries.

Swelling site may suggest certain DDX according to the Triangle site (e.g. anterior: thyroid, thyro-glossal cyst. Posterior: Cystic Hygroma\*).



\* A **cystic hygroma**, also known as **cystic lymphangioma** and **macrocytic lymphatic malformation**, is often a congenital multiloculated lymphatic lesion that can arise anywhere, but is classically found in the left posterior triangle of the neck and armpits.

# Main Categories of Neck Swellings

Three broad categories: Congenital, inflammatory, or neoplastic

- In adults, any neck swelling either solid or cystic is considered malignant until proven otherwise.

- A swelling in the parotid area is a **parotid lesion**.

- The location of the mass can focus the DDX.

- In General, in patients over 45 years of age, assume a neck lump is metastatic malignant disease until proven otherwise <sup>(2)</sup>.

## 1. Ranula

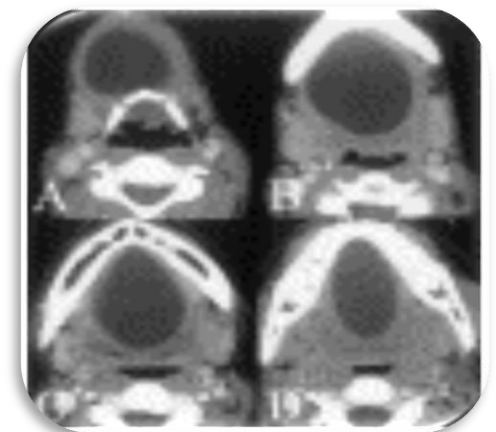
It is a retention cyst arises from the sublingual duct obstruction and extravasation of mucoid content, mostly located in sub-mentum.

Soft, fluctuant, transilluminates and bluish in color <sup>(2)</sup>.

Treatment:

Intra-oral: **Marsupialization**.

Extra-oral: **surgical resection with sublingual gland**.





## 2. Dermoid Cyst

- ❖ Due to **epithelial entrapment**.
- ❖ Either developmental or traumatic.
- ❖ Non-tender and mobile.
- ❖ If congenital: Midline or submental.
- ❖ **Treatment: surgical excision.**



## 3. Thyroglossal Cyst

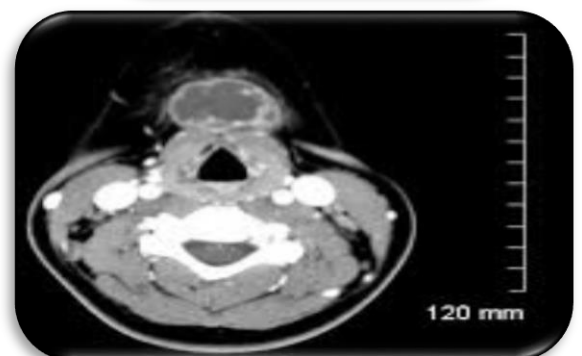
- ❖ Midline cyst (anywhere in the course of thyroglossal tract).
- ❖ Usually, asymptomatic till gets infected, presents in childhood or early adulthood.
- ❖ **It moves with swallowing and with protrusion of the tongue.**  
This occurs because it is attached to the thyroglossal tract, which attaches to the larynx by the peritracheal fascia <sup>(3)</sup>
- ❖ **The diagnosis** is confirmed with ultrasound.
- ❖ **Treatment: Sistrunk procedure** (surgical excision of the duct and the base of the tongue with the central portion of hyoid bone).

### **Notes (3):**

- Thyroglossal cysts (TGCs) are usually non-tender and mobile.
- Infected TGCs may present as a tender mass.
- A tender infected TGC may be associated with dysphagia, dysphonia, draining sinus, fever, or increasing neck mass.
- An infected TGC may present like an upper respiratory tract infection.
- Airway obstruction is possible, particularly with intralingual cysts close to the airway.

### **Investigation:**

- 1. Thyroid function tests (TFTs):** ectopic thyroid gland cannot be ruled out even in the presence of normal TSH levels and a clinically euthyroid history.
- 2. Ultrasound:** can distinguish solid from cystic components.
- 3. CT scan:** shows the capsular enhancement.



## 4. Branchial Cysts

Arise from the embryonic branchial clefts (1-4), present usually in late childhood or early adulthood. They are relatively consistent with their location “anterior to the sternocleidomastoid muscle” and pass unrecognized until get infected. If ruptured, they could cause fistula. **Cysts arising form the 2<sup>nd</sup> branchial cleft have to be distinguished from nasopharyngeal carcinoma.**

**Diagnosis:** ultrasound and CT scan.

**Treatment:** control the infection, then surgical excision.

### *Note:*

*Branchial cysts are painless, non-tender until inflamed, and cholesterol granules are found in aspiration.*



Branchial cleft cysts<sup>(4)</sup>: Type 1 cysts if infected, they will extend to the external auditory meatus, and they may be also in the parotid gland.

Type 2 cysts account for 95% of branchial anomalies; they may involve the submandibular gland, and may present anywhere along the course of the second branchial fistula, which proceeds from the skin of the lateral neck, between the internal and external carotid arteries (e.g. palatine tonsil). Therefore, a second branchial cleft cyst is part of the differential diagnosis of a parapharyngeal mass.

Type 3 cysts occur anywhere along the course (posterior to the carotid arteries, thyrohyoid membrane, and finally the larynx), they might be inside the larynx.

Type 4 cysts' course is parallel to the recurrent laryngeal nerve, could arise in the thyroid gland or in mediastinum.

## 5. Laryngocele

“Hernia of the larynx” it is an air filled cyst appears more with Valsalva maneuver “like blowing up a balloon”.

## 6. Carotid Body Tumors (Paraganglioma)

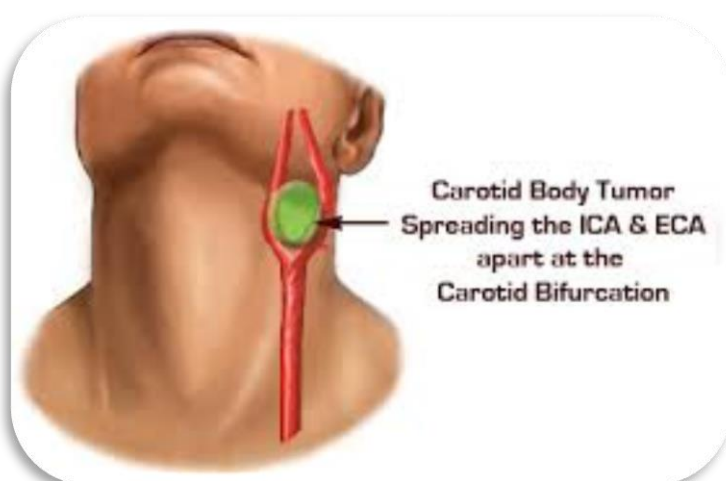
These are benign tumors arise from extra-adrenal chromaffin cells in the parasympathetic ganglia.

Clinical features:

- ✓ Mobile sidewise **“Fontaine’s sign”**
- ✓ Highly vascular; pulsatile and bruit in auscultation.
- ✓ **Painless, fainting attacks and slow growing lump** <sup>(2)</sup>.

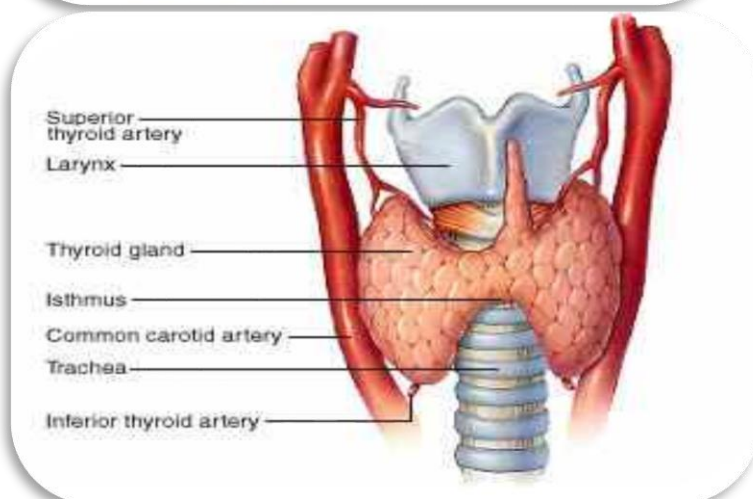
**Diagnosis:** ultrasound, and confirmation by MRA/carotid angiogram.

**Treatment:** surgical excision.



**Note:**

*Carotid body tumor arises lateral to the bifurcation of the carotid artery “superior to the thyroid cartilage”. It is compressible with continuous pressure.*





## 7. Hemangioma

- ❖ Red or bluish mass.
- ❖ Soft and compressible.
- ❖ Course: rapid growth followed by slow regression.
- ❖ Intervention only if symptomatic (airway obstruction or bleeding).
- ❖ **Think about AV fistula if the Hemangioma was pulsatile.**



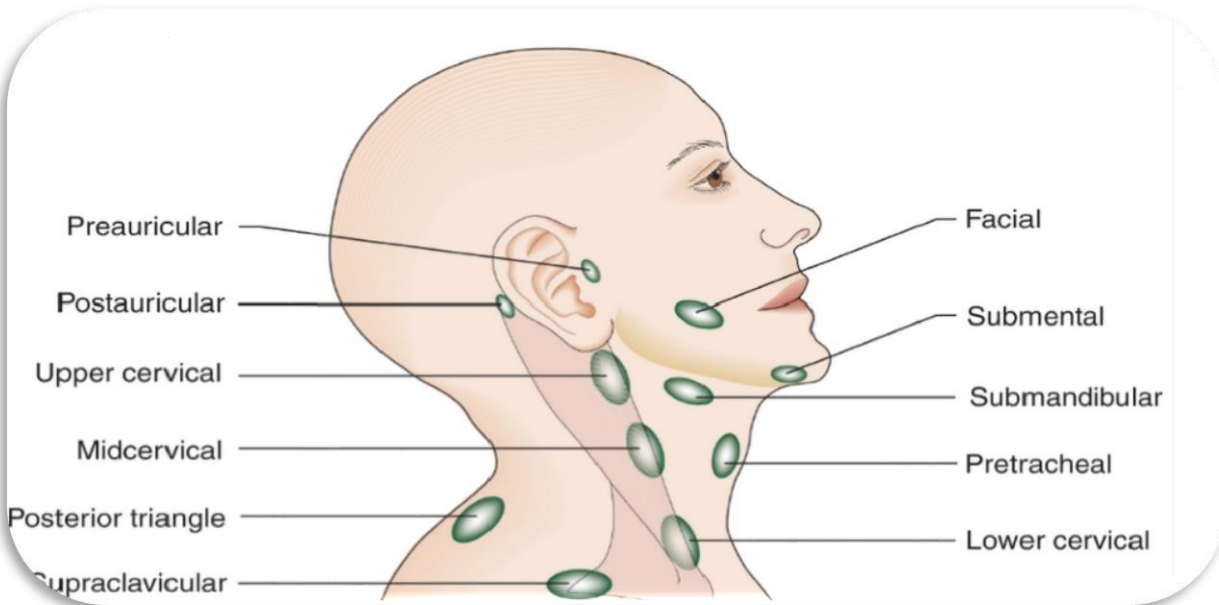
## 8. Cystic Hygroma

- ❖ Lymphatic malformation during fetal development.
- ❖ Soft, non-tender, compressible and **transilluminates.**
- ❖ **Treatment:** complete excision could be difficult, use **sclerotherapy** and laser for debulking and contouring.



# 9. Cervical Lymphadenopathy

- Anatomy:



- Inflammatory lymphadenopathy:

<u>Disease</u>	<u>Micro-Organism</u>	<u>Lab-Test</u>
<b><u>Viral Lymphadenitis</u></b>		
<u>Non-Specific</u>	<u>Adeno, Rhino, Entero</u> <u>Virus</u>	-----
<u>Infectious mononucleosis(IM)</u>	<u>EB Virus.</u>	<u>Monospot test.</u>
<u>AIDS</u>	<u>HIV</u>	<u>ELISA/PCR</u>
<b><u>Bacterial Lymphadenitis</u></b>		
<u>Pyogenic</u>	<u>S.aureus, Straps</u>	<u>G.Stain and C&amp;S</u>
<u>TB</u>	<u>Mycobacterium TB</u>	<u>PPD skin test (Tuberculin)</u>
<u>Brucellosis</u>	<u>Brucella /(G-) Bacillus</u>	<u>Brucella titer</u>
<u>Toxoplasmosis</u>	<u>Protozoan</u>	<u>CFT, Hemagglutination test</u>

- Lymphadenopathy can be anywhere in the neck

- If you find them, examine the drainage and the rest of lymph nodes in the body.

- Treatment of TB:

Isoniazid + Rifampicin + Pyrazinamide + Ethambutol + Vit.B6 (for 2 months)

Followed by: Isoniazid +Rifampicin (for 6 months).

- Treatment of Brucellosis:

A combination of two drugs, one from each group:

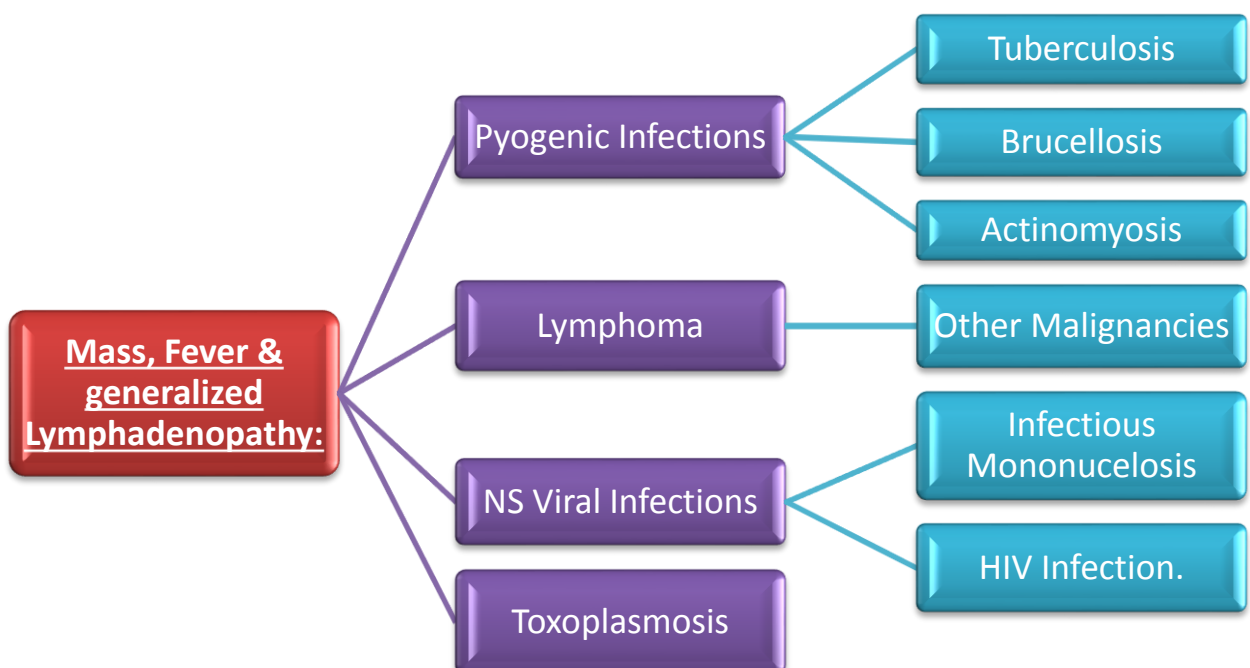
**Doxycycline or Ciprofloxacin + Rifampicin or Streptomycin.**

- Treatment of Actinomycosis:

- ❖ Actinomycosis is caused by a bacterium that is present normally among flora in the mouth & throat.
- ❖ Cause is actinomyces Israelii.
- ❖ Follows bad dental surgery.
- ❖ Forms fluctuating mass (granuloma) that discharges sulfur granules from sinuses in sub-mandibular region.
- ❖ **Treatment:** high dose of penicillin, if allergic, give erythromycin or clindamycin

- Malignant lymphadenopathy:

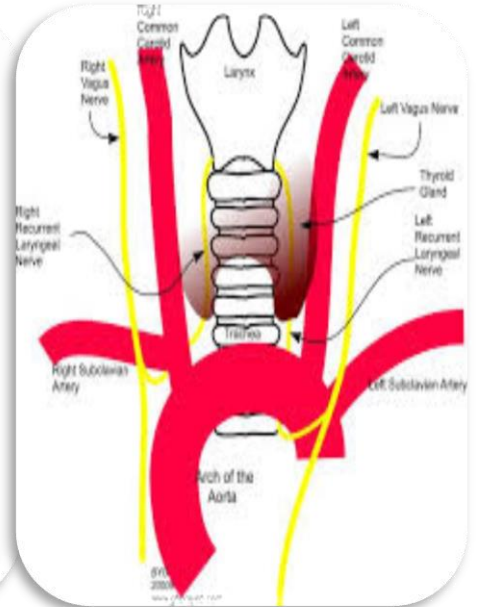
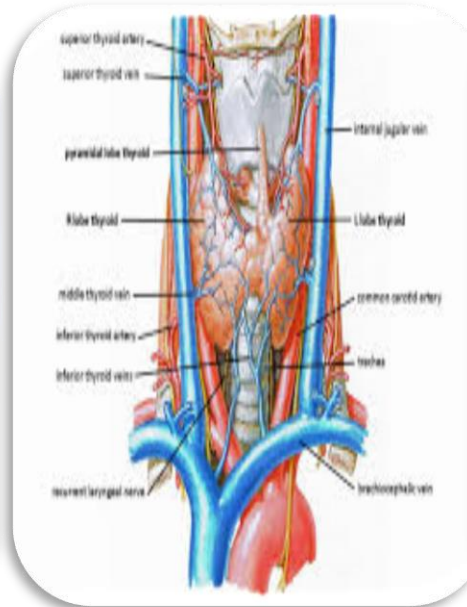
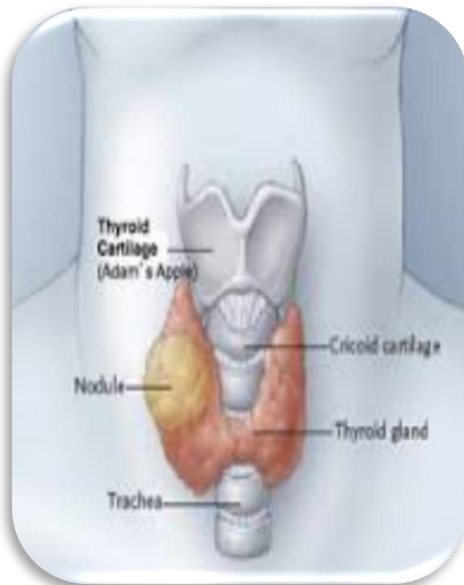
- ❖ Lymphoma.
- ❖ Metastasis from: Face/Scalp, squamous Cell Carcinoma, malignant melanoma, pharynx /larynx, bronchus/esophagus, thyroid, salivary gland malignancy.





# 10. Thyroid Related Abnormalities

- Anatomy:



- Abnormalities:

- ✓ Thyroid nodule.
- ✓ Multi-nodular goiter.
- ✓ Grave's disease.

- Treatment of Grave's disease:

**Medical:** Anti- thyroid drugs (Carbimazole or Propyl-Thio-uracil) + Propranolol (beta – blocker).

**Radioactive Iodine.**

**Surgical resection.**



## 11. Submandibular Gland Related Abnormalities



Submandibular gland



Adenoma



Sialadenitis



Duct stones

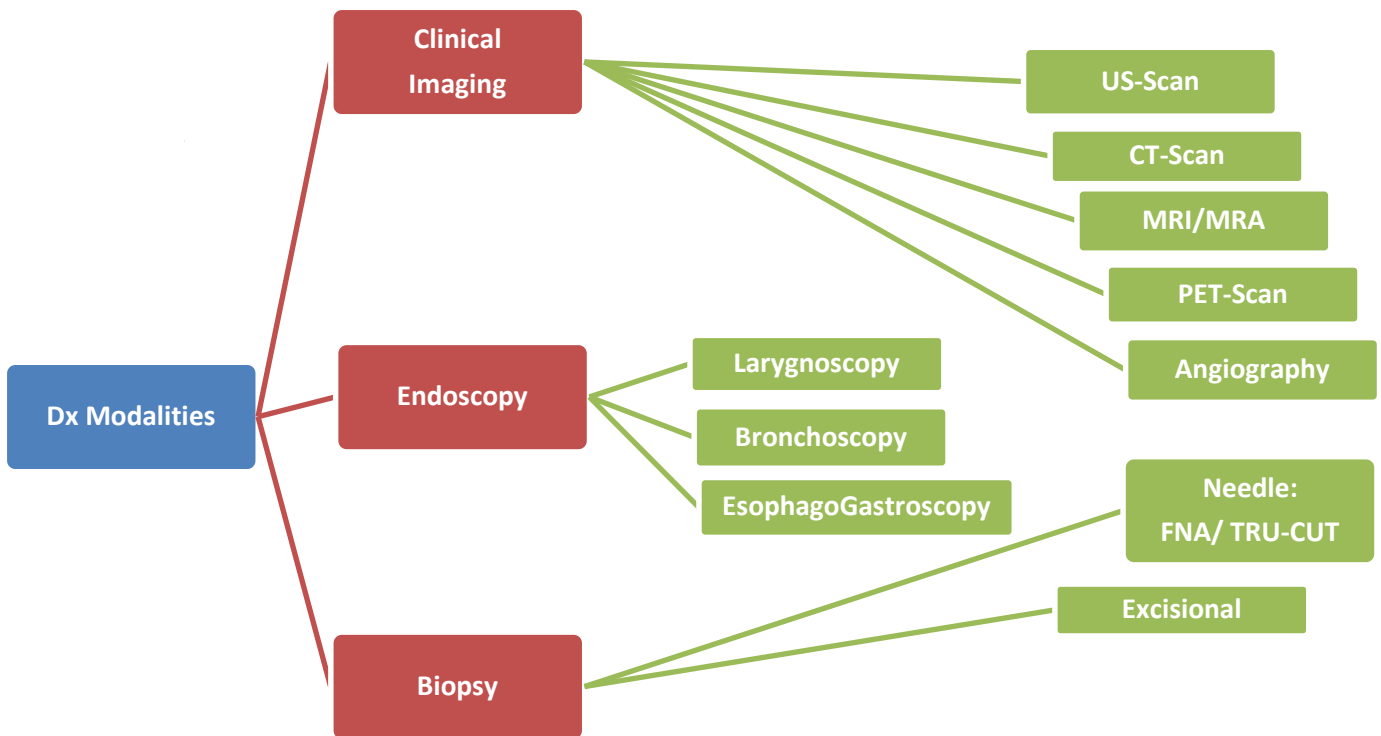
## 12. Sjogren's syndrome:

Involves all salivary glands and lacrimal glands leading to their hypertrophy and destruction and resulting in very dry mouth and dry Eyes.

Associated with autoimmune diseases with heavy lymphatic infiltration.

Treatment is symptomatic and supportive.

## Common diagnostic modalities:

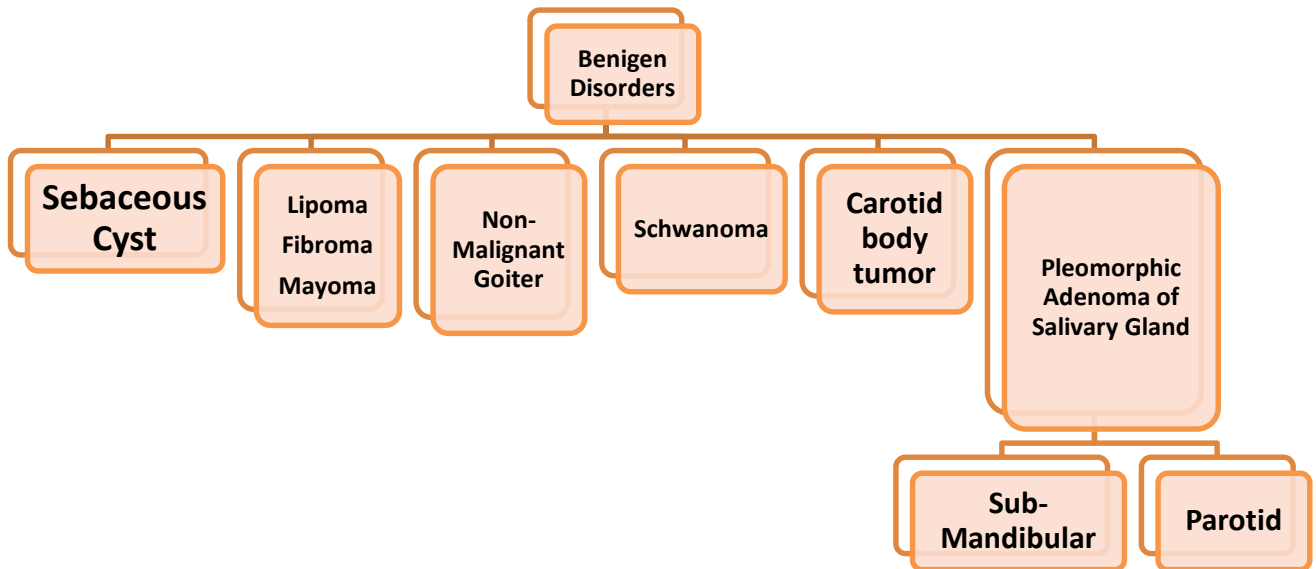
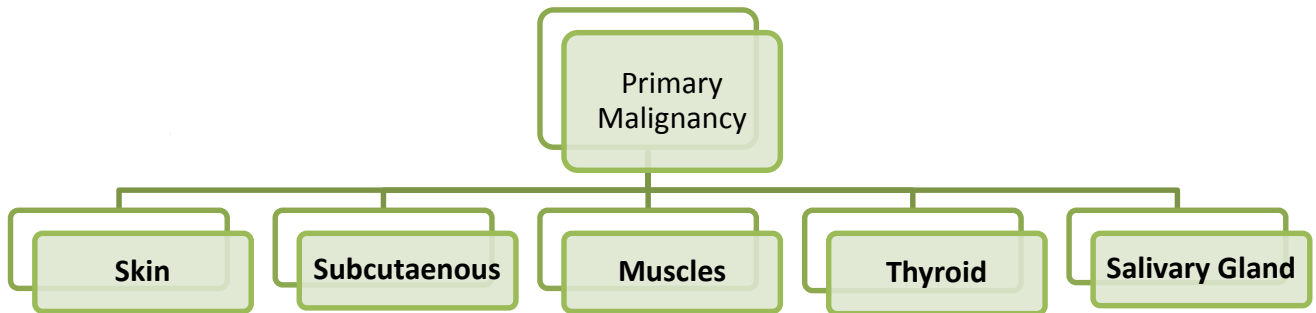


### Characteristic Features for some Neck Swellings

<b>Branchial Cyst:</b>	Anterior to Sternomastoid muscle cyst in upper half and lateral + Cholesterol crystals
<b>Thyro-glossal Cyst:</b>	Midline, moves with tongue
<b>Sialadenitis/Parotid/ Sub-Mandibular:</b>	Pain aggravated by salivation (food)
<b>Hemangiomas:</b>	Compressible
<b>Arteriovenous Fistula:</b>	Pulsatile/Thrill and bruit
<b>Cystic Hygroma:</b>	Compressible/Trans-illumination
<b>Laryngocele:</b>	Air-filled cyst, at larynx
<b>Actinomycosis:</b>	Sinuses discharging, Sulfur granules



## Benign versus Malignant Disorders:



## SUMMARY

1. In adults, any neck swelling either solid or cystic is considered malignant until proven otherwise.
2. In General, in patients over 45 years of age, assume a neck lump is metastatic malignant disease until proven otherwise.
3. Common neck swellings:
  - A- **Ranula**: treatment/ Intra-oral: Marsupialization, Extra-oral: surgical resection with sublingual gland.
  - B- **Dermoid cyst**: treatment: **Surgical excision**.
  - C- **Thyroglossal cyst**: (It moves with swallowing and with protrusion of the tongue). treatment: Sistrunk procedure
  - D- **Branchial cyst**: (Cysts arising from the 2nd branchial cleft have to be distinguished from nasopharyngeal carcinoma). Treatment: control the infection, then surgical excision.
  - E- **Laryngocele** "Hernia of the larynx" it is an air filled cyst appears more with Valsalva maneuver.
  - F- **Carotid Body Tumors**: Mobile sideways "Fontaine's sign". Treatment: surgical excision.
  - G- **Hemangioma**: Intervention only if symptomatic (airway obstruction or bleeding).
  - H- **Cystic Hygroma**: Soft, non-tender, compressible and transilluminates. Treatment: use sclerotherapy and laser .
  - I- **Cervical Lymphadenopathy**
  - J- **Sjogren's syndrome**: Involves all salivary glands and lacrimal glands leading to their hypertrophy and destruction and resulting in very dry mouth and dry Eyes.

## IMPORTANT NOTES FROM EXTERNAL RESOURCES

### Notes

(1)	<a href="http://reference.medscape.com/article/1968303-overview#showall">http://reference.medscape.com/article/1968303-overview#showall</a>
(2)	Churchill pocketbook
(3)	<a href="http://www.patient.co.uk/doctor/Thyroglossal-Cysts.htm">http://www.patient.co.uk/doctor/Thyroglossal-Cysts.htm</a>
(4)	<a href="http://emedicine.medscape.com/article/382803-overview">http://emedicine.medscape.com/article/382803-overview</a>
(5)	The Washington Manual of Surgery 6 <sup>th</sup> Edition, Chapter 28: Head and Neck Surgery
Figure 1	<a href="http://img.medscape.com/pi/emed/ckb/clinical_procedures/79926-1412901-1968303-1980199.jpg">http://img.medscape.com/pi/emed/ckb/clinical_procedures/79926-1412901-1968303-1980199.jpg</a>
Figure 2	<a href="http://img.medscape.com/pi/emed/ckb/clinical_procedures/79926-1412901-1968303-1980202.jpg">http://img.medscape.com/pi/emed/ckb/clinical_procedures/79926-1412901-1968303-1980202.jpg</a>

### Additional Information

**Thyroglossal duct cysts** <sup>(5)</sup>: They arise from a failure of the thyroglossal duct to obliterate after the embryologic descent of the thyroid from the foramen cecum at the base of tongue to the low anterior neck. Patients present with a midline neck mass, that moves vertically with swallowing and tongue protrusion, as the cyst tract is closely involved with the hyoid bone. Definitive treatment is the Sistrunk procedure, involving resection of the cyst, its tract, and the central portion of the hyoid bone, which reduces recurrence. Preoperative thyroid US ensures the cyst is not a functioning thyroid tissue. Transformation into papillary thyroid carcinoma may rarely occur.

# Questions(surgical recall)

## NECK MASS

<b>What is the usual etiology in infants?</b>	Congenital (branchial cleft cysts, thyroglossal duct cysts)
<b>What is the usual etiology in adolescents?</b>	Inflammatory (cervical adenitis is #1), with congenital also possible
<b>What is the usual etiology in adults?</b>	Malignancy (squamous is #1), especially if painless and immobile
<b>What is the "80% rule"?</b>	In general, <b>80%</b> of neck masses are <b>benign</b> in children; <b>80%</b> are <b>malignant</b> in adults older than 40 years of age
<b>What are the seven cardinal symptoms of neck masses?</b>	Dysphagia, odynophagia, hoarseness, stridor (signifies upper airway obstruction), globus, speech disorder, referred ear pain (via CN V, IX, or X)
<b>What comprises the workup?</b>	Full head and neck examination, indirect laryngoscopy, CT scan and MRI, FNA for tissue diagnosis; biopsy contraindicated because it may adversely affect survival if malignant
<b>What is the differential diagnosis?</b>	Inflammatory: cervical lymphadenitis, cat-scratch disease, infectious mononucleosis, infection in neck spaces Congenital: thyroglossal duct cyst (midline, elevates with tongue protrusion), branchial cleft cysts (lateral), dermoid cysts (midline submental), hemangioma, cystic hygroma Neoplastic: primary or metastatic
<b>What is the workup of node-positive squamous cell carcinoma and no primary site?</b>	Triple endoscopy (laryngoscopy, esophagoscopy, bronchoscopy) and blind biopsies
<b>What is the treatment?</b>	Surgical excision for congenital or neoplastic; two most important procedures for cancer treatment are radical and modified neck dissection



## OSCE

### ✘ History of a lump or an ulcer:

- 1-Duration /when was it first noticed?
- 2-First Symptome/ What broght it to the patient's notice?
- 3-Other symptomes/what other symptomes does it cause?
- 4-Progression/How has it changed since it was first noticed?
- 5-Persistance/Has it ever disappear or healed?
- 6-Multiplicity/Has(had) the patient any other lumps or ulcers?
- 7-Cause/What does the patient think caused it?

### ✘ Examintion:

#### -Local exam:

(4Ss)Size-site-shape-surface.

(DDE)Depth-Discharge-Edge.

(2Ts)Temprature-Tenderness.

(2Cs)Color-Composition"consistency-Fluctuation-Fluid thrill-translucency-Pulstile-compressibility-Bruit"

(3Rs)Reducibility-Realtion to surrondings"mobility"-Regional lymph nodes.

State of local tissues: Arteries-Nerves-Bones/joints.

#### -General Exam

### ✘ DDX: Study the lecture

