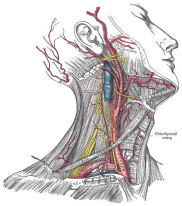
Head & Neck
I, II, III



Objectives:

- Lecture 1: Neck Mass
  - Anatomy of the neck
  - History / physical examination
  - Pathology / differential diagnosis
  - Management/ investigation and treatment
- Lecture 2: Premalignant & Malignant Oral Cavity Lesions
  - Premalignant lesions: submucous fibrosis and leukoplakia
  - Oral cavity cancer
- Lecture 3: The Pharynx
  - Tumors of pharynx (nasopharyngeal cancer, oropharyngeal & hypopharyngeal cancer)
  - Tumors of larynx (Intro, laryngeal papillomatosis, ca larynx)

Resources: F2 slides
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Revised by: Rotana Khateeb

[Color index: Important | Notes | Extra]

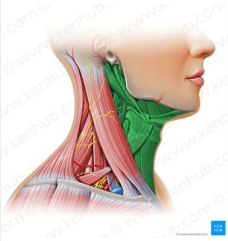
Lecture 1: Neck Mass

Triangles of the neck

Key facts about the triangles of the neck	
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 boeder of sternocleidomastoid muscle **Subdivisions:** - Muscular (omotracheal) triangle - Carotid triangle - Submandibular triangle - Submental triangle
Posterior triangle	**Borders:** - Anterior - posterior margin of sternocleidomastoid muscle - Posterior - anterior margin of trapezius muscle - Inferior - middle one-third of clavicle **Subdivisions:** - Occipital triangle - Supraclavicular (omoclavicular) triangle

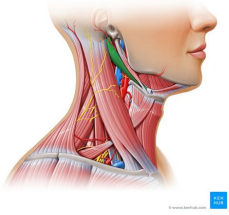
Anterior Triangle

Borders, subdivisions and contents of the anterior triangle	
Definition	Triangular area of the neck found anteriorly to the
Borders	Superior - inferior border of mandible Medial - midline of neck Lateral - anterior boeder of sternocleidomastoid muscle
Subdivisions	Muscular (omotracheal) triangle Carotid triangle Submandibular triangle Submental triangle
Contents	**Muscles:** thyrohyoid, sternothyroid, sternohyoid muscles **Organs:** thyroid gland, parathyroid glands, larynx, trachea, esophagus, submandibular gland, caudal part of the parotid gland **Arteries:** superior and inferior thyroid, common carotid, external carotid, internal carotid artery (and sinus), facial, submental, lingual arteries **Veins:** anterior jugular veins, internal jugular, common facial, lingual, superior thyroid, middle thyroid veins, facial vein, submental vein, lingual veins **Nerves:** vagus nerve (CN X), hypoglossal nerve (CN XII), part of sympathetic trunk, mylohyoid nerve



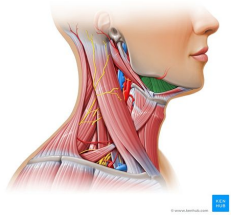
Carotid Triangle

Borders and contents of the carotid triangle	
Borders	Anterior - superior belly of omohyoid muscle Superior - stylohyoid and posterior belly of digastric muscles Posterior - anterior border of sternocleidomastoid muscle
Contents	*Arteries:* common carotid, external carotid (and branches except maxillary, superficial temporal and posterior auricular), internal carotid artery (and sinus) *Veins:* internal jugular, common facial, lingual, superior thyroid, middle thyroid veins *Nerves:* vagus nerve (CN X), hypoglossal nerve (CN XII), part of sympathetic trunk



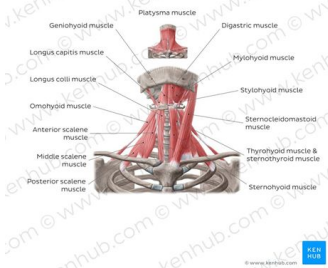
Submandibular Triangle

Borders and contents of the submandibular (digastric) triangle	
Borders	Superior - inferior border of mandible Lateral - anterior belly of digastric muscle Medial - posterior belly of digastric muscle
Contents	*Viscera:* submandibular gland and lymph nodes (anteriorly), caudal part of the parotid gland (posteriorly) *Vessels:* facial artery and vein, submental artery and vein, lingual arteries and veins *Nerves:* mylohyoid, hypoglossal (CN XII)



Submental Triangle

Borders and contents of the submental triangle	
Borders	Inferior - hyoid bone Lateral - anterior belly of digastric muscle Medial - midline of neck
Contents	Anterior jugular vein, submental lymph nodes

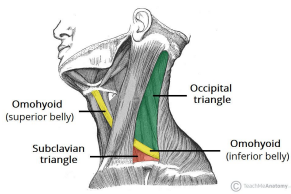


Posterior Triangle

Borders, subdivisions and contents of the posterior triangle	
Borders	Anterior - posterior margin of sternocleidomastoid muscle Posterior - anterior margin of trapezius muscle Inferior - middle one-third of clavicle
Subdivisions	Occipital triangle Supraclavicular (omoclavicular) triangle
Contents	**Vessels:** the third part of the subclavian artery, suprascapular and transverse cervical branches of the thyrocervical trunk, external jugular vein, lymph nodes **Nerves:** accessory nerve (CN XI), the trunks of the brachial plexus, fibers of the cervical plexus

Occipital Triangle

Borders and contents of the occipital triangle	
Borders	Anterior - posterior margin of sternocleidomastoid muscle Posterior - anterior margin of trapezius muscle Inferior - inferior belly of omohyoid muscle
Contents	Accessory nerve (CN XI), branches of the cervical plexus, upper most part of brachial plexus, supraclavicular nerve



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Supraclavicular Triangle

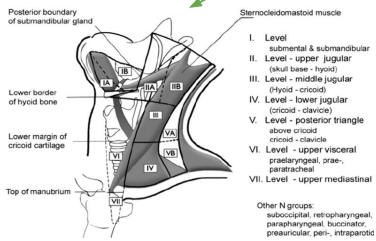
Borders and contents of the supraclavicular (omoclavicular) triangle	
Borders	Superior - inferior belly of omohyoid muscle Anterior - posterior edge of sternocleidomastoid muscle Posterior - anterior edge of trapezius muscle
Contents	Third part of the subclavian artery, brachial plexus trunks, nerve to subclavius muscle, lymph nodes

Cervical Lymph Nodes

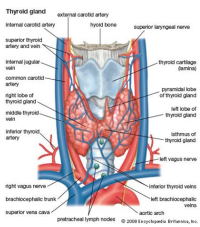
Cervical lymph nodes are very important and commonly present in the exam (especially levels 2 & 3). Know each level, its content, and boundaries. Level 1 lymph nodes are divided to 1A (Submental Part) & 1B (Submandibular Part). Level 2 (also called the upper jugular, from the base of the skull up to the hyoid bone). Level 3 (Mid 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). Level 7 (upper mediastinal).

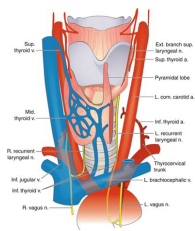
Lymphatic triangles: anatomical point of view

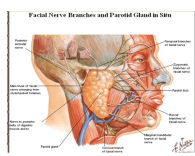
- Anterior: lied by midline anteriorly and SCM posteriorly.
- Posterior: lied by SCM anteriorly and Trapezius posteriorly.

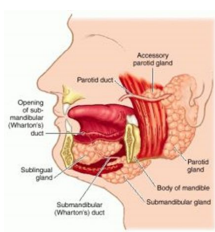


Thyroid gland anatomy	- Butterfly-shaped gland - Isthmus :overlying 2nd to 4th tracheal rings (doctor said to 3rd, and it varies between individuals) Supplied by the recurrent laryngeal nerve - Parathyroids (posterior to thyroid gland)
Parotid Gland	- Lies over the angle of mandible - Divided to Superficial and deep lobes by the Facial nerve - Stenson's duct : opens in the mouth opposite to maxillary second molar
Submandibular Gland	- Lies inferior and posterior to the mandible - Mylohyoid muscle runs through the lobules of the gland and section it into superficial and deep parts - Wharton's duct opens at the lingual papilla









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 approximatly 4cm high, 1.5cm wide, 2cm 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, Anastamoses with contralateral STA.

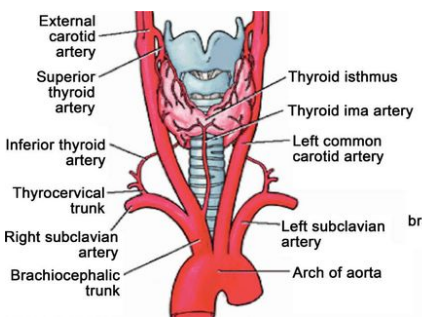
– Inferior thyroid artery (ITA): From thyrocervical trunk (1st part of subclavian at 1st rib)

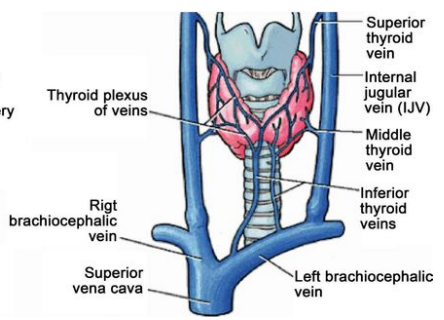
Venous Drainage: 3 pairs of vains

– 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 vein

– Inferior thyroid vein: Ant surface thyroid (opposite of ITA), Vertical downward course to brachiocephalic v.3.





Approach to Neck Masses

History

- Age (pediatrics are usually infectious or congenital, while in elderly it could be cancer), gender, ethnicity
- Duration of neck mass (>2 weeks is likely to be malignant, while if it's since birth, it's likely to be congenital)
- Progression (of the mass size, increasing or decreasing)
- Associated symptoms :URTI
- Voice change (pressure or recurrent laryngeal injury)
- Hx of cough, fever, sore throat, night sweats,weight loss
- Recent travel (goes more with infectious)
- Insect bite
- Dental problems (space infections and abscesses)
- Tobacco and alcohol use
- Exposure to Radiation
- Family history of malignancy

Physical Exam

- For each patient **Full head and neck examination including the cranial nerves and nasopharyngolaryngoscopy**
- Location of the mass: midline (thyroid, thyroglossal, dermoid), lateral (branchial cyst, lymph node enlargement)
- Size, consistency, tenderness (more with infectious) , mobility
- Pulsation
- Skin changes
- Movement with swallowing or tongue protrusion (thyroglossal cyst incommon in exams)

Differential Diagnosis Depends of the triangle

Adult

- 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 Reactive adenopathy Parotitis Atypical mycobacteria	Adenitis Thyroiditis Ludwig's angina	Adenitis Sialadenitis
Congenital	Branchial cleft cyst Laryngocoele Congenital torticollis	Thyroglossal duct cyst Dermoid cyst	Cystic hygroma
Neoplastic	Hemangioma Neurogenic tumors Salivary gland tumors	Thymomas Lymphoma Lipoma Goiter	Lymphoma Metastatic lesions Neuroblastoma Rhabdomyosarcoma
Traumatic	Hematoma Acquired torticollis	Laryngeal fracture	Hematoma Acquired torticollis

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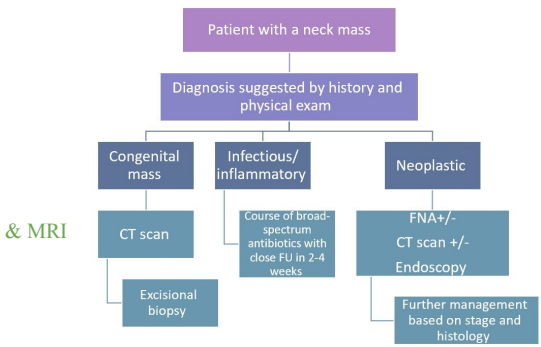
General Approach to Neck Masses

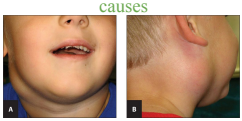


Infectious/inflammatory masses

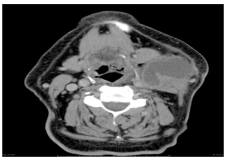
Cervical lymphadenitis:

- Most common in children and adolescents
- ***Etiology:***
  1. Bacterial: streptococcal and staphylococcal infections, mycobacterial infections, 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
- ***Diagnosis:*** CBC (for leukocytosis), CT scan (if patient does not respond to antibiotic)
- ***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.

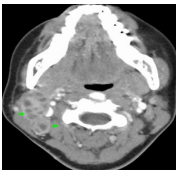
Boy Image: Enlargement of lymph node at level 2. We see redness, which goes with inflammatory/infectious causes



CT Scan: Axial cut with contrast showing a collection (abscess formation)



matting

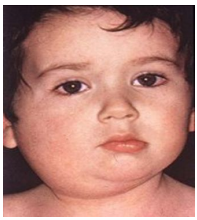


Tuberculous cervical lymphadenitis:

- Scrofula (another name)
- Most common manifestation of extrapulmonary TB
- Non tender
- If untreated , spontaneous discharge and sinus formation
- CT scan may show necrotic/cystic nodal matting (Matting: Multiple lymph nodes adherent to each other)
- FNA (for culture) / excisional biopsy (excisional biopsy: to differentiate between TB and lymphoma)
- ***Treatment***: antimycobacterial medications

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
- ***Treatmen***t is supportive, hydration and analgesics



- **Acute suppurative parotitis/sialadenitis :**
  - Commonly seen in elderly , diabetic , debilitated and dehydrated patients
  - Staph aureus is the usual causative organism
  - Fever, swelling , pus from stenson's duct
  - Antibiotics and hydration
  - If you suspect abscess do CT + incision & drainage

Neoplastic Masses

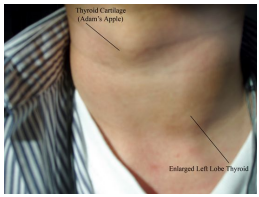
Benign:

- Lipoma , fibroma, neuroma and schwannoma

Malignant:

- Primary neck tumors – sarcoma, salivary gland tumors, thyroid gland tumors, parathyroid gland tumors
- Lymphoma
- Metastasis

- **Thyroid gland nodules:**
  - benign thyroid nodules are very common
  - 5-10 % are malignant
  - Hot vs cold

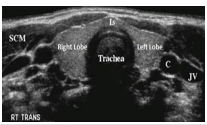
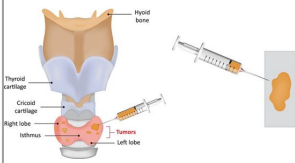
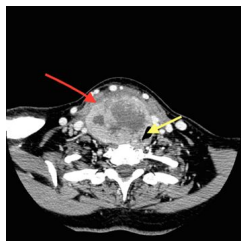


Thyroid Nodule Evaluation

- U/S (1st & best step - shows nodule characteristics)
- FNA (2nd step, done if indicated)
- Thyroid Function Tests
- CT (has certain indications)

Risk factors for malignancy:

History	Physical Exam
- External radiation during childhood - Age <20 or >60 years - Male gender - Family history of thyroid cancer - Hoarseness, dysphagia (indicate invasion to nearby structures e.g. esophagus & recurrent laryngeal) - Rapid growth (goes with lymphoma)	- Firm or hard (goes with malignancy) - Fixed to soft tissue or skin - Lymphadenopathy

Ultrasound Best for thyroid	Fine needle aspiration FNA	CT scan
characteristics of thyroid nodules that increase suspicious of malignancy : - Taller than wide shape - Speculated margin - Microcalcifications - Marked hypoechogenicity - Increased vascularity  	- Safe and minimally invasive - Indicated for nodules > 1 cm or nodules with suspicious features of malignancy. - US guided FNA (to be specific) **Fine Needle Aspiration of Thyroid Nodules** 	Cases indicating CT scan: - Recurrent disease - Lymph node metastasis - Vocal cord paralysis - Fixation of tumor to adjacent structures or skin - Huge goiter , retrosternal extension 

- **Malignant Thyroid Lesions**

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.

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

Treatment:

- Observation for small, benign looking, cystic nodules
- Follow Up with ultrasound every 6 months

Thyroidectomy indicated for:

- Malignancy or Suspicious for malignancy
- Compression symptoms
- Cosmetic
- Graves disease
- Toxic nodule

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

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 of 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) o 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:
  1-CT head and neck with contrast "showed multiple lymph node, 3—4 cm, homogeneous,WHAT'S next? FNAB. DON'T FORGET THAT!!! MCQs
  2-FNAB – first line diagnostic test .
  3-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

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.

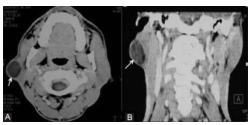
- Salivary gland tumors:

Pleomorphic adenoma
Exam question

- it's the most common benign tumor of salivary gland
- It can arise from parotid, submandibular or minor salivary glands
- Slow growing , usually seen in the third or fourth decade , with propensity to females.
- Encapsulated, Pseudopods (indicate full gland excision)

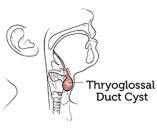
Mucoepidermoid carcinoma
Exam question

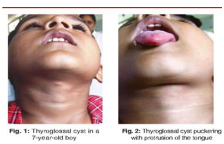
- it's the most common malignant tumor of salivary gland
- Can invade the facial nerve
- Slow growing
- Low grade (parotidectomy) and high grade (neck dissection).
- Surgical excision



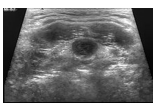
Congenital masses

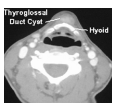
- Thyroglossal duct cyst Exam question





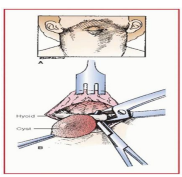
- Cystic midline swelling (anywhere on the midline)
- Affecting young children but can occur at any age
- Increases in size with URTI
- +_ sinus
- Moves with tongue protrusion because of its attachment to foramen cecum
- It may contain the only functioning thyroid tissue
- Rarely malignant <1%
- Investigations :Ultrasound to evaluate cyst and thyroid





Treatment :

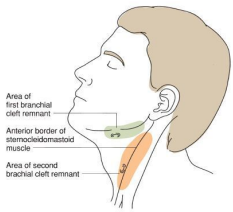
- Surgical excision including the body of hyoid bone and core of tongue tissue to prevent recurrence (Sistrunk's procedure)



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, sebaceous glands)
- Typically seen in the midline of the neck , usually in the submental region (important)
- Treatment is complete surgical excision

Branchial cyst



- Common in the second decade of life
- Lateral swelling in the upper part of the neck anterior to SCM (level 2)
- Anomalies of second branchial arch are the most common
- May be associated with a sinus or a fistula
- 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
- CT is the investigation of choice for a lateral mass
- Treatment is surgical excision along with its tract , if present

Cystic hygroma

- Congenital mass
- It occurs most commonly in the posterior triangle of the neck
- It 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)
- Soft, cystic and partially compressible
- Treatment is surgical excision for septic hygroma

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 : VEGF, urinary beta-fibroblast growth factor,urinary matrix mettaloprotinease MMP
  - MRI is the investigation of choice
  - Management (depends of the symptoms): observation (if not causing symptoms), surgical excision (if affecting the eye, or causing airway obstruction), tracheostomy (to secure the airway) laser, propranolol (new treatment of choice if not causing symptoms)

- 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

1st lecture end here

• Oral submucous fibrosis (OSMF)

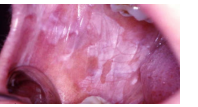
- OSMF is a high risk *precancerous* condition that predominantly occurs among Indians, uncommon in KSA.
- **Factors implicated in the pathogenesis of submucous fibrosis:**
  Chilly consumption,
  Betel-nut chewing,
  Genetic predisposition

- OSMF is a chronic mucosal condition affecting any part of the oral mucosa.
- Mucosal rigidity of varying intensity due to fibroelastic transformation of the juxta epithelial connective tissue layer.
- The presence of **palpable fibrous bands is a diagnostic criterion** for submucous fibrosis (clinical diagnosis)
- When the tongue is affected, it is **devoid of papillae** and its mobility, especially the protrusion, is impaired. It will 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.

picture in exam:
Pale and fibrosis

Treatment :

- Some temporary relief from the symptoms and improvement in the oral opening with medicinal treatment such as local injections of cortisone
- It is essential to follow-up the patients regularly due to risk of malignancy
- Patient education to discontinue the use of betel nut and tobacco in any form.



- **Leukoplakia**: VERY IMPORTANT! Exam question (describe the picture)
  - Leukoplakia is the **most common premalignant** or "potentially malignant" lesion of the oral mucosa. buccal mucosa
  - It is a 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 is seen most frequently in **middle-aged and older men**.
  - Men are more affected in some countries.

Clinical presentation:

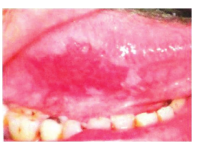
- Leukoplakia can be either solitary or multiple
- It may appear on any site of the oral cavity
- Common sites being: **buccal mucosa** (most common), alveolar mucosa, floor of the mouth, tongue, lips and palate

Classically two clinical types of leukoplakia are recognized:

- ***Homogeneous 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-homogeneous 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)

lateral part; whitish, superficial

homogeneous



non-homogeneous

Risk factors:

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

Leukoplakia cont.:

Treatment:

- Risk of malignant transformation is not completely eliminated by any of the current therapies. cause the whole area is prone
- Initial treatment of a white oral lesion is the elimination of the possible aetiological factors.
- **Complete surgical removal (leaving free-lesion borders)** is recommended in cases with epithelial dysplasia. to make sure everything is removed
- Apart from surgical excision, other treatment modalities available include cryosurgery, laser surgery, retinoids, beta-carotene, bleomycin, calcipotriol, photodynamic therapy.

Prognosis and complications:

- 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.

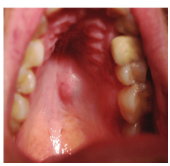
Oral cancer : squamous cell carcinoma most common

- Tobacco and alcohol have synergistic effect major risk factor
- Treatment of early oral cancer is surgery.
- 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 lips to the plane between junction of the hard palate and soft palate.
- Include: Lips and oral cavity (buccal mucosa,tongue, ginggiva, retromolar trigone, floor of mouth, hard palate)

Ulcerative, looks malignant, squamous carcinoma

There are leukoplakia changes involving the tongue, squamous carcinoma

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

- Oral cancer cont.:

Risk factors

- **Heavy tobacco**
- **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

Pathology

- **90% SCC:** squamous cell carcinoma Well/Moderate/Poorly/Undifferentiated affects prognosis
- Exophytic, Ulcerative, Infiltrative,verrucous
- Other malignancies: Adeno Ca / 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)

Clinical presentation

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

Diagnosis

- **Clinical**: History, Detail clinical examination (used headlamp, 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 either areas of the head and neck to rule out second primary, very important
- **Biopsy** prove the diagnosis (most commonly squamous cell carcinoma)
- **Staging**: CT with contrast, MRI (especially with tongue cancer), PET scan (to rule out metastasis to lung, liver and bone)

Treatment

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

- Oral cancer cont.:

Treatment cont.

- **Surgery:** Addressing the tumor, neck lymph node metastasis, reconstruction and secure the airway to make sure it's safe (tracheostomy)
- Radiotherapy
- Chemotherapy
- Concomitant Radio+Chemotherapy

} if there are free margins

- Palliative Chemotherapy for advanced diseases

Treatment method depends on the TNM stage:
Stage 1,2: single modality
Stage 3,4: double modality

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
- Lymph node extension (Level, size, extracaps of meta)
- Metastasis

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

2nd lecture end here

Lecture 3: The Pharynx

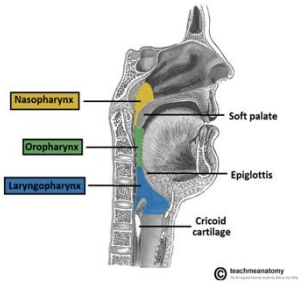
The Pharynx:

it's divided into 3 anatomical regions: very important to know

1-Nasopharynx

2-Oropharynx

3-Hypopharynx present late ; neck metastasis cause of the vague symptoms



- 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.

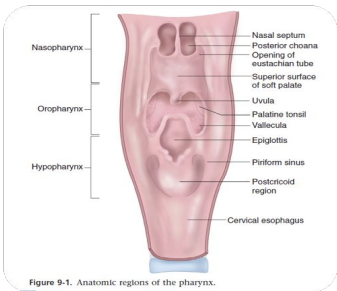


Figure 9-1. Anatomic regions of the pharynx.

Structure of Pharyngeal Wall

From within outwards it consists of four layers:

1-Mucous membrane

2-Pharyngeal aponeurosis

3- Muscular coat

4- Buccopharyngeal fascia

Waldeyer's Ring: a collection of lymphatic tissue

1-Adenoids (nasopharynx)

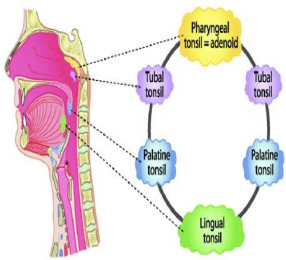
2-Palatine tonsils

3- Lingual tonsils

4-Tubal tonsils (around eustachian tube in fossa of Rosenmuller) important as it is a common site for nasopharyngeal cancer

5- Lateral pharyngeal bands

6- Nodules (in posterior pharyngeal wall)



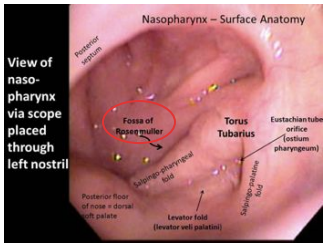
- larynx cancer present early due to vocal cords symptoms
- oral cancer responds to surgery here chemotherapy

Nasopharynx

Nasopharynx (Epipharynx):

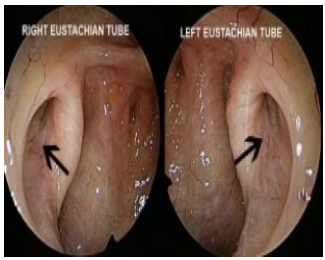
It lies behind the nasal cavities and extends from the base of skull to the soft palate or the level of the horizontal plane passing through the hard palate

- **Roof:** basisphenoid and basiocciput (skull base)
- **Posterior:** prevertebral muscles and fascia
- **Floor:** soft palate
- **Anterior wall:** posterior choanae of nose
- **Lateral wall:** ET



-Opening of eustachian tube situated 1.25 cm behind the posterior end of inferior turbinate.

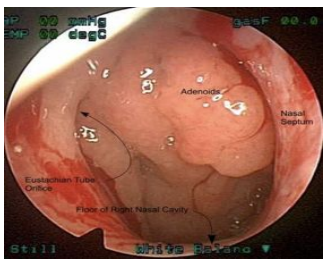
-Above and behind the tubal elevation is a recess called ***fossa of Rosenmuller*** which is the commonest site for origin of carcinoma. (nasopharyngeal)



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

Nasopharyngeal Tonsil (Adenoids):

Benign. It is a subepithelial collection of lymphoid tissue. It increases in size up to the age of six years and then gradually atrophies. in kids mostly, adults shouldn't have it, but it's called nasopharyngeal mass if it's still found in adults even if it's benign



Epithelial Lining of Nasopharynx:

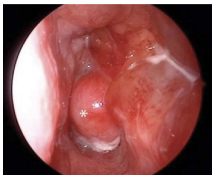
It is lined by pseudostratified ciliated columnar epithelium. that's why squamous cell carcinoma is the most common type of cancer in the nasopharynx

Lymphatic drainage

Also commonly, nasopharyngeal cancer presents as a neck mass draining into upper deep cervical nodes either directly or indirectly through retropharyngeal and parapharyngeal lymph nodes. They also drain into spinal accessory chain of the nodes in the posterior triangle of the neck. So metastasis can happen

• Nasopharyngeal Fibroma (Juvenile Nasopharyngeal Angiofibroma):

- **VERY IMPORTANT!**
- 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?
- 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.

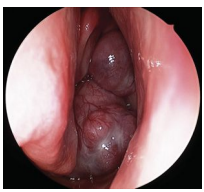
Pathology:

- Made up of vascular and fibrous tissues
- Mostly, the vessels are just endothelium-lined spaces with no muscle coat that's why it easily bleeds
- Extensions of nasopharyngeal Fibroma
- **Benign**
- **Locally invasive**

Clinical Features:

1. Age and sex(10-20 years)
2. Profuse and recurrent epistaxis (exam scenario)
3. Progressive nasal obstruction and denasal speech
4. Conduction hearing loss and serous otitis media ET blocked
5. Mass in the nasopharynx nasal cavity

- Depend on the extent of tumour can disrupt adjacent structures

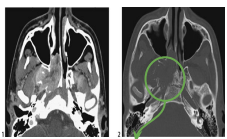


vascular mass

Investigations:

1. Soft tissue lateral film of nasopharynx
2. X-rays of paranasal sinuses and base of skull
3. **CT scan of the head with contrast** enhancement is now the investigation of choice

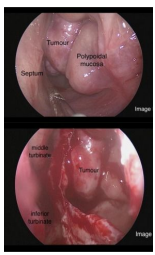
- MRI (indicated if we suspect skull base involvement)
- Carotid angiography
- **Biopsy Avoided** (bleeding risk & difficult to perform)



bone destruction

Treatment:

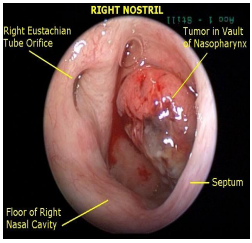
- **Surgical excision** is now the treatment of choice
- Endoscopic (if small) vs open approach (if large and invasive)
- **Pre op Embolization** to reduce bleeding (24 - 48 hrs)
- Recurrence is possible



- 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 (mainly)**
- Lymphomas
- Rhab-domyosarcoma, malignant mixed salivary tumour or malignant chordoma

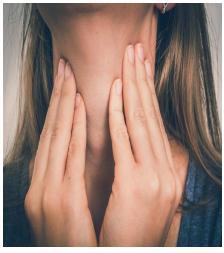


Mass, fungating, ulcerative, and it bleeds - Malignant

Clinical Features:

- **Nasal obstruction**
- **Unilateral Otitis Media with Effusion**
- Nearly all the cranial nerves may be involved when extension
- Jugular foramen syndrome
- Cervical lymphadenopathy (most common) (60-90%) neck mass

NECK MASS + NASAL OBSTRUCTION = NASOPHARYNGEAL MALIGNANCY



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
- MRI (if expecting skull base invasion)
- Bone scan (to rule out metastasis)
- TNM staging

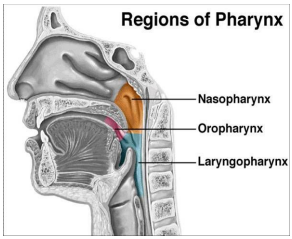
Treatment:

- **Chemoradiation** (main therapy, responds very well)
- salvage surgery rare

Oropharynx

Applied Anatomy:

- Oropharynx extends from the plane of hard palate above to the plane of hyoid bone.



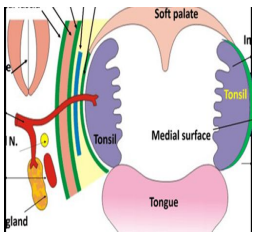
Boundaries of Oropharynx:

- It is related to retropharyngeal space and lies opposite the second and the upper part of the third cervical vertebrae.

a. Base of tongue, posterior to circumvallate papillae
b. Lingual tonsils

Palatine tonsils:

Palatine tonsils (base of the tongue) are a collection of lymphoid tissue present in the submucosa of the oropharynx.

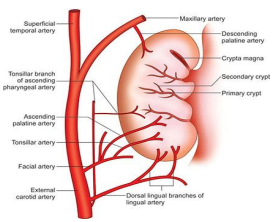


- Located in the tonsillar fossa , one on each side
- **Boundaries of the tonsillar fossa:**

a. Anterior: palatoglossal arch
b. Posterior: palatopharyngeal arch
c. Inferior: dorsal surface of posterior 1/3rd of the tongue
d. Lateral: lateral wall of the oropharynx(superior constrictor muscle)

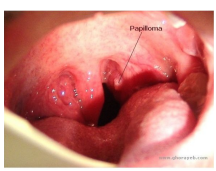
- **Blood Supply:**

1. Tonsillar artery a branch of the facial artery mainly
2. External carotid
3. Lingual artery
4. Maxillary artery

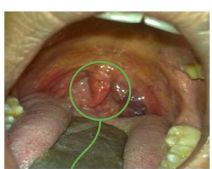


- ***Lymphatic drainage***: jugulodigastric lymph nodes.

● Benign tumors of the oropharynx:

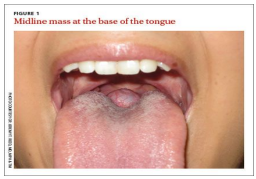


- Papilloma: (HPV) It is usually pedunculated, arises from the tonsil, soft palate or faucial pillars.
- Hemangioma (rare) CT scan 1st, biopsy only if possible
- Pleomorphic Adenoma



hemangioma

- **DDx of midline lingual mass** common question
  - **Thyroglossal duct cyst**
  - **Lingual thyroid** (ectopic thyroid) mostly



- Malignant Tumors

The common sites of malignancy in the oropharynx are:

1. Posterior one third (or base) of tongue
2. Tonsil and tonsillar fossa
3. Faucial palatine arch, soft palate and anterior pillar
4. Posterior and lateral pharyngeal wall

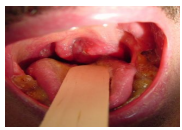
Subsites in the oropharynx

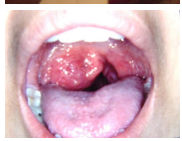
- Base of tongue
- Tonsil, tonsillar fossa
- Faucial arch
- Pharyngeal wall

Histologically , the tumor may be:

1. Squamous cell carcinoma (the most common)
2. Lymphoepithclioma
3. Adenocarcinoma
4. Lymphomas

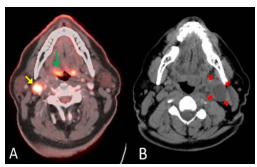
Carcinoma Tonsil and Tonsillar Fossa





- Squamous cell carcinoma is the most common and presents as an ulcerated lesion with necrotic base.
- Lymphomas may present as unilateral tonsillar enlargement with or without ulceration and may simulate indolent peritonsillar abscess ulceration is more common in SCC
- As if infection; but non respondent to Abx

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 or lump in the throat 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

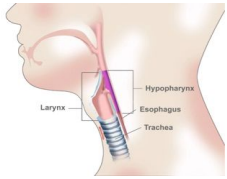
Diagnosis: Biopsy - CT scan with contrast - MRI - TNM staging

Treatment options: Surgery, Chemotherapy, Radiotherapy, Combination

Treatment method depends on the TNM stage:
Stage 1,2: single modality
Stage 3,4: double modality

Hypopharynx

Hypopharynx



- Lowest part of the pharynx
- present late;vague symptoms
- 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

Functions of hypopharynx:

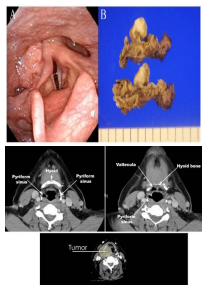
- Common pathway for air and food
- Provides a vocal tract for resonance of certain speech sounds
- Helps in deglutition

Papilloma of the posterior laryngeal wall

Benign tumors of hypopharynx are uncommon.

Malignant tumors involves various subsites :

- Pyriform sinus
- Post-cricoid region
- Posterior pharyngeal wall



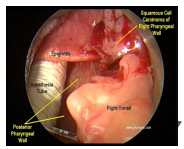
• Carcinoma of pyriform sinus

- 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

• Carcinoma of post-cricoid region common Q

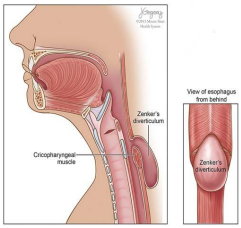
- 30% of hypopharyngeal cancer
- Associated with Paterson-Brown-Kelly (**Plummer-Vinson**) syndrome characterized by hypochromic microcytic anemia
- Young female with dysphagia (rule it out)
- Plummer Vinson Syndrome Triad:
  - Hypochromic microcytic anemia
  - Young female
  - Carcinoma of post cricoid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

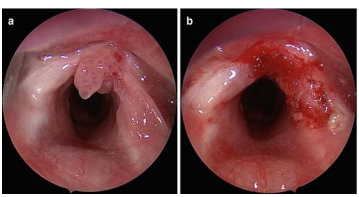


- **Zenker's diverticulum** (common in exams)
- Pulsion diverticulum where pharyngeal mucosa herniates through the Killian's dehiscence.
- Killian's dehiscence is a weak area between two parts of the inferior constrictor. above cricopharyngeal muscle
- Cause is unknown
- Due to spasm of cricopharyngeal sphincter or its incoordinated 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.

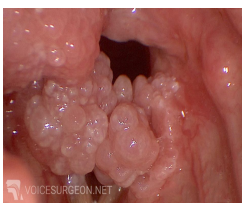
Larynx

Recurrent Respiratory Papillomatosis

Common in benign - HPV 6, 11 minor risk - 16,18 Malignant



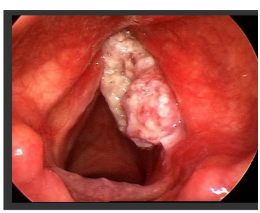
Treatment: excision



Treatment of choice:
Debulking; cause airway obstruction in severe cases +/- Adjuvant Antiviral injection

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