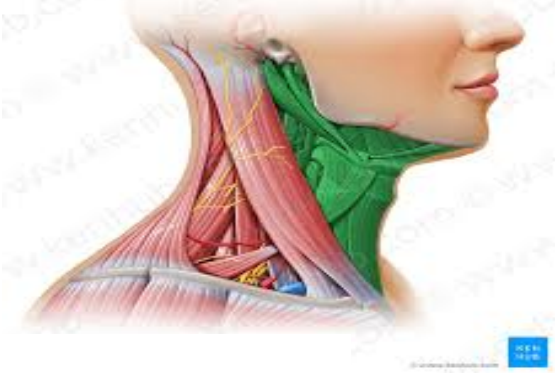
Neck Masses

By

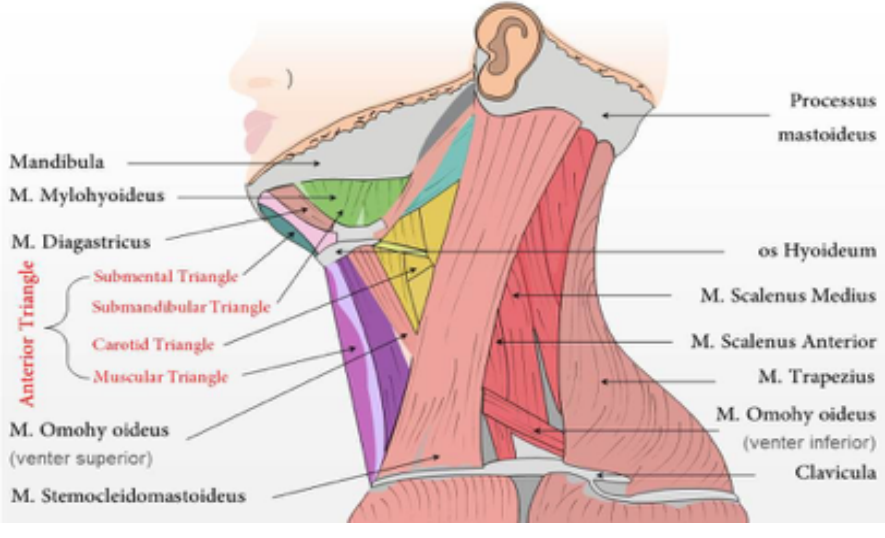
Professor Tareq Mahafza

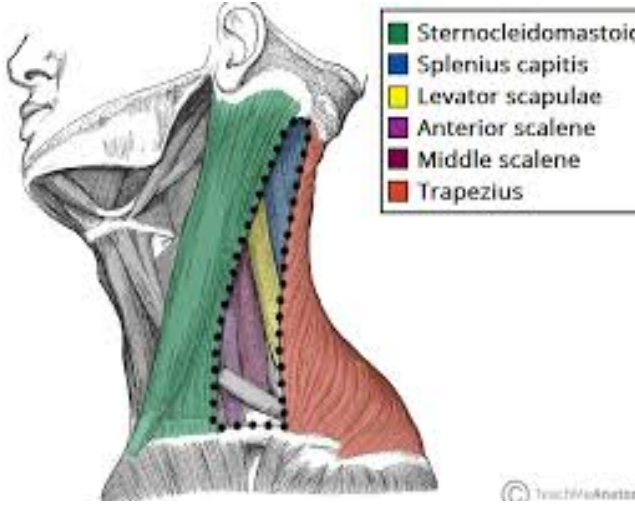
University of Jordan

Anatomy of the neck

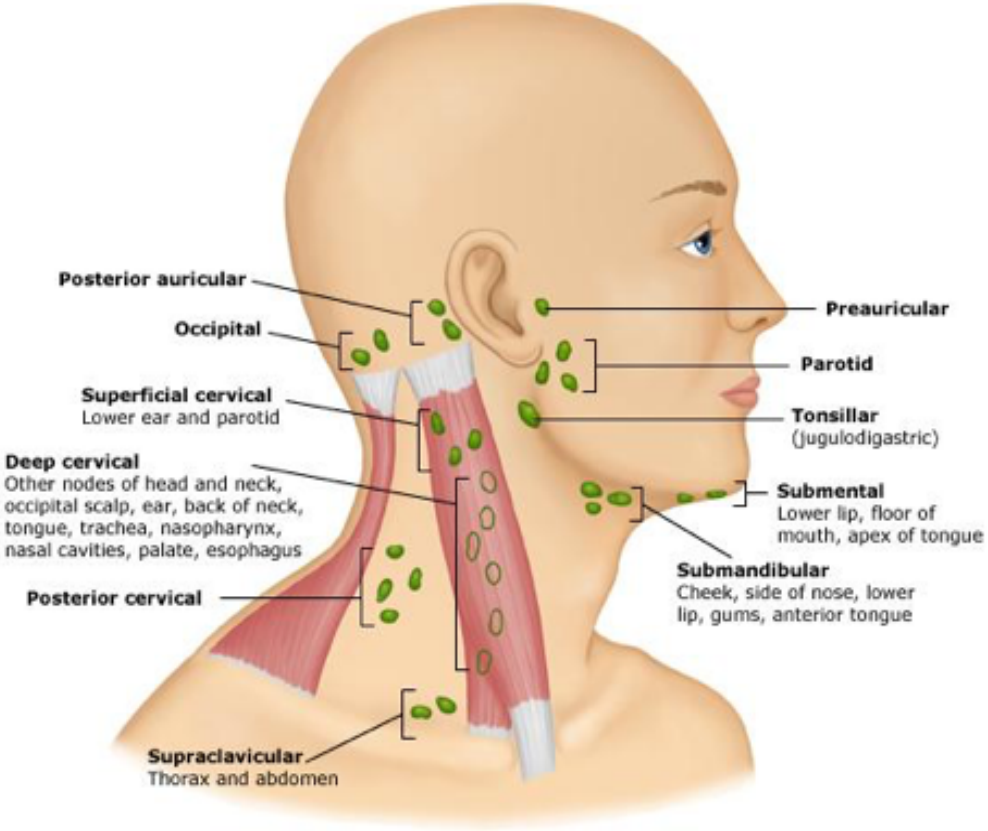


Anterior Triangle of Neck

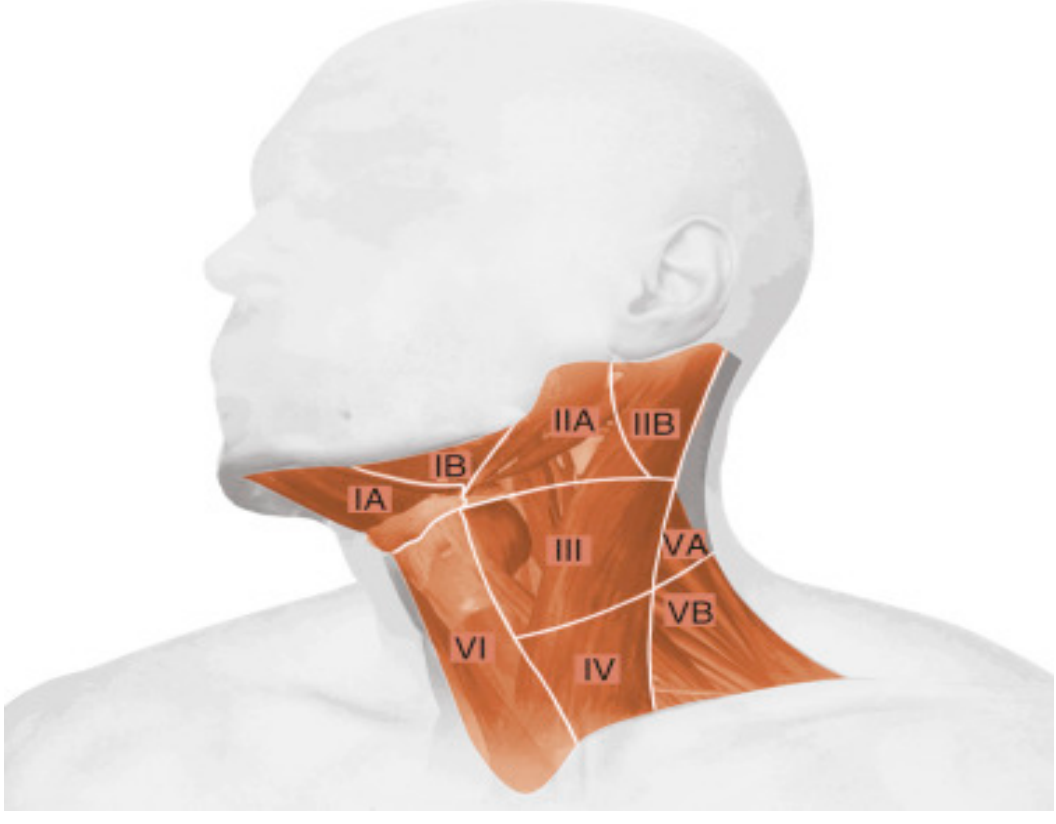


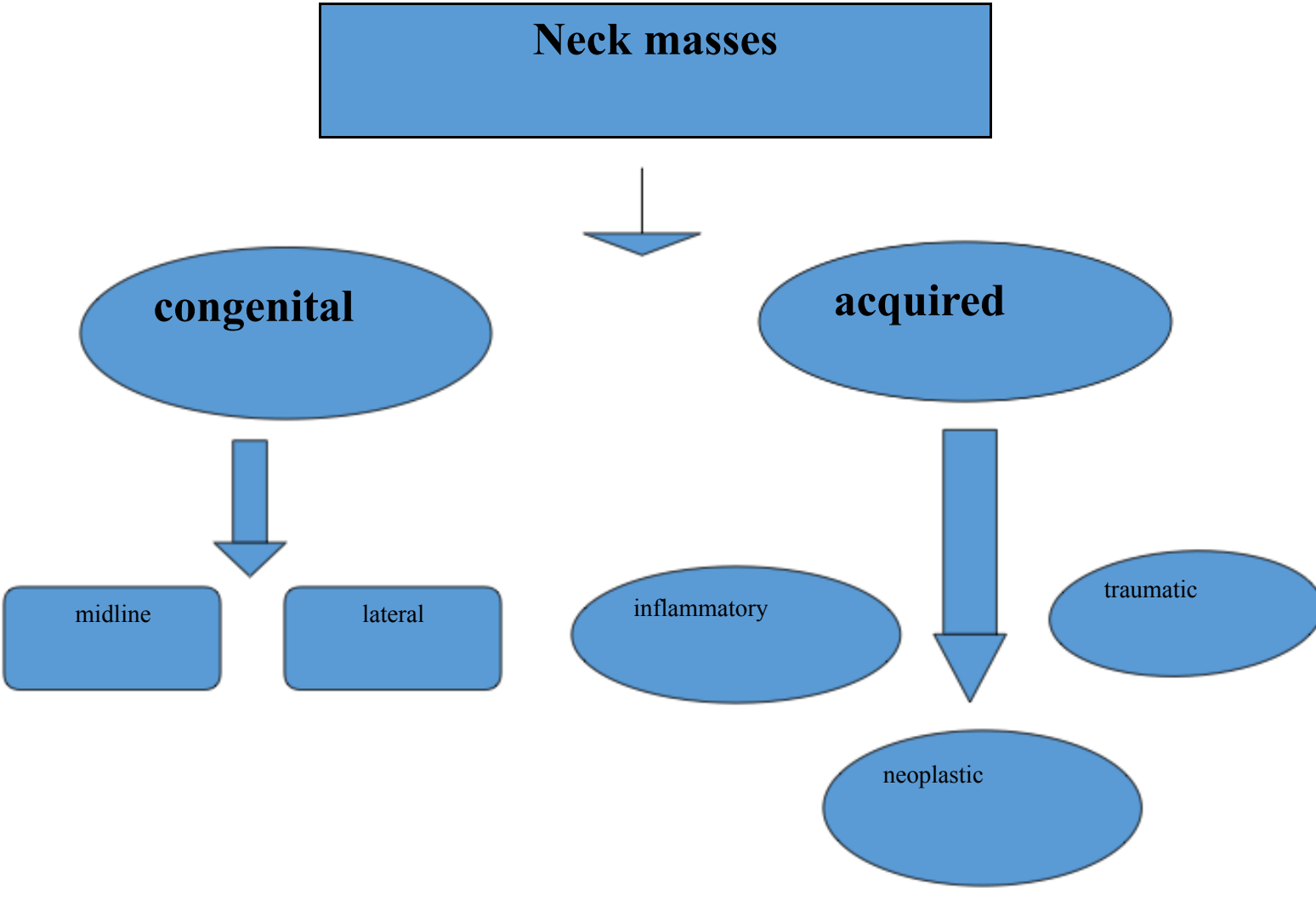


Lymphatic drainage of the head and neck



Cervical Lymph Nodes by Levels




Neck masses
congenital
acquired
midline
lateral
inflammatory
traumatic
neoplastic

Approach to neck mass

- Careful history
- Thorough physical examination
- Investigations
- Proper counseling
- Treatment
- Follow-up

History taking

- Patient profile
- **Complaints**
- History of present illness
- Past medical history
- Psychosocial history
- System review

Physical Examination

- **Examine :**

  ears, nose, throat, head and neck and rest of the body if you have to

- **Examination is by:**

  inspection, palpation and auscultation

Characteristics of a neck mass upon examination

- Site, size, growth, fixation, redness, hotness, pulsation, consistency, tenderness, edges, shape, attachment to the skin or other structures, fluctuation, compressible.

- **The most important characteristics:**

  tenderness, progression, and consistency

Investigations

- Based on suspicion index

- **Rules:**
- Effective
- Cost effective
- Safety (invasiveness)

- **Possible investigations:**
- ➢ Laboratory
- ➢ Radiological
- ➢ Endoscopic
- ➢ Histopathological

Diagnostic Tests

- **Laboratory tests**
- **Endoscopy:**

  rigid and flexible
- **Radiology**;

  US, CT-Scan, MRI, Radionucleotide scanning, others
- **Histopathology;**

  Fine needle aspiration biopsy (FNAB),

  open biopsy

Congenital Neck Masses

- **Medline:**

dermoid
thymic cyst,
thyroglossal duct cyst.

Lateral:

branchial cyst,
hemangioma,
lymphangioma

Dermoid cyst

Dermoid cyst.
USG a well-defined cyst with posterior acoustic enhancement and a heterogeneous echopattern due to fat globules.

CECT –
cystic lesion in the midline in the floor of the mouth, with small discrete areas of fatty attenuation characteristically giving a "sac-of-marbles" appearance

Thyroglossal Duct Cyst

- Most common midline congenital neck mass (70%)
- 90% present before age 10 years
- Occurs along the remnants of thyroid gland duct
- Usually just inferior to hyoid bone (65%), but could be above or pre-hyoid level
- Compressible non-tender mass which elevates on swallowing or protrusion of tongue
- Treatment is surgical removal of cyst and central part of the body of hyoid bone (Sistrunk operation) after resolution of any infection

Thyroglossal Duct Cyst

Thymic Cyst

- Thymus develop from 3rd pharyngeal pouch and descend to neck to the mediastinum.
- Thymic remnants may persist anywhere in its path from angle mandible to midline of neck.
- Swelling either cystic or solid.
- Can occur in children or adults by presents of anterior neck mass and deep to middle SCM.
- Rare condition
- Tx: Surgical excision + sternotomy if extend into mediastinum.

Lateral Neck Masses

- **Branchial cleft anomalies**
- **Laryngoceles**
- **Ranula**
- **Lymphangiomas & hemangiomas**

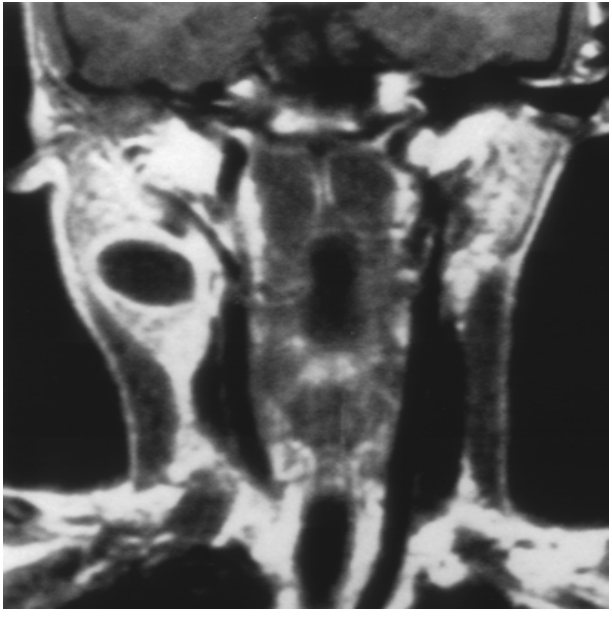
Plunging Ranula

- It is due to obstruction of sublingual salivary gland or a mucous retention cyst
- May perforates through mylohyoid muscle into neck
- Presents as a non-tender slow-growing bluish mass in the sublingual area in the oral cavity
- Ultrasound helps in the diagnosis
- Treatment is excisional biopsy

Branchial Cleft Cyst

- Arise from the second to 5-th branchial clefts
- Appear at any age, but usually in the first or second decade of life
- Typical place of origin is medial to the anterior border of sternomastoid muscle between the upper and middle thirds
- 75% is a cystic mass, but in 25% either fistula or sinus
- The mass is cystic, compressible, non-tender, rounded and smooth
- Usually appears or increase in size after upper respiratory infection
- Treatment is by excisional biopsy

Branchial Cleft Cysts



Vascular Masses

- Lymphangiomas and hemangiomas
- Usually within 1st year of life
- Hemangiomas often resolve spontaneously, while lymphangiomas remain unchanged
- CT/MRI may help define extent of disease
- Lymphangioma – surgical excision for easily accessible or lesions affecting vital functions
- Hemangiomas – surgical excision reserved for those with rapid growth involving vital structures

Hemangioma

- The most common tumor of infancy and childhood (4-10%)
- 3-5 times more seen in girls
- More seen in premature infants (<1200 grams% 23)
- Not frequent in darker-skinned babies
- Usually occurs in first 2 weeks after birth
- Initially, a pale-colored, telangiectatic or macular red stain or purple-colored stain
- Single lesion in 80%, 20% more than one lesion
- In patients with more than one lesion accompanies other system hemangiomas (liver etc.)

Vascular Tumors (hemangioma)

Lymphangioma

- Arise from early sequestration of embryonic lymphatic channels, most commonly developing along the jugular chain.
- Four types -
  - Cystic hygroma,
  - Cavernous lymphangioma
  - Capillary-lymphangioma
  - Vasculo-lymphatic malformation.

  - **Cystic hygromas** are the most common form of lymphangioma; 75% occur in the neck.

  - Usually centered in the posterior triangle or the sub-mandibular space.

Huge cystic hygroma

Developmental Neck Masses??

- **Laryngocele**
- **Hypopharyngeal pouch (Zenker diverticulum)**

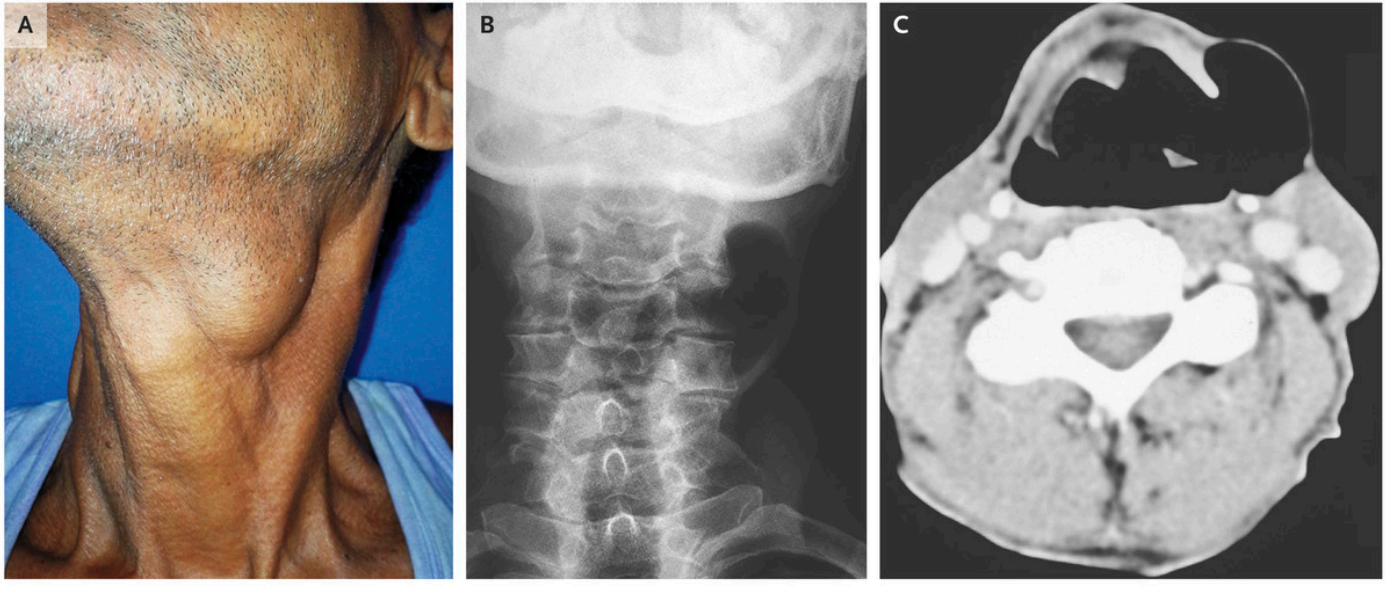
Laryngocele

- It is a dilatation of the laryngeal saccule
- It is an uncommon with Incidence 1: 1 million per year
- Males females ratio is 5:1
- Peak age incidence is 5 & 6 decades
- There are three types: internal, external and mixed laryngoceles
- **Etiologies:** not known yet, but it is more common in people with glass blower, trumpet players and in patients with laryngeal carcinoma
- **Clinical picture:** hoarseness, cough, stridor, dysphagia, sore throat and neck mass
- **Diagnosis:** endoscopy, plain x-ray with Valsalva, CT scan
- **Treatment:** if internal endoscopic marsupialization and surgical excision if external

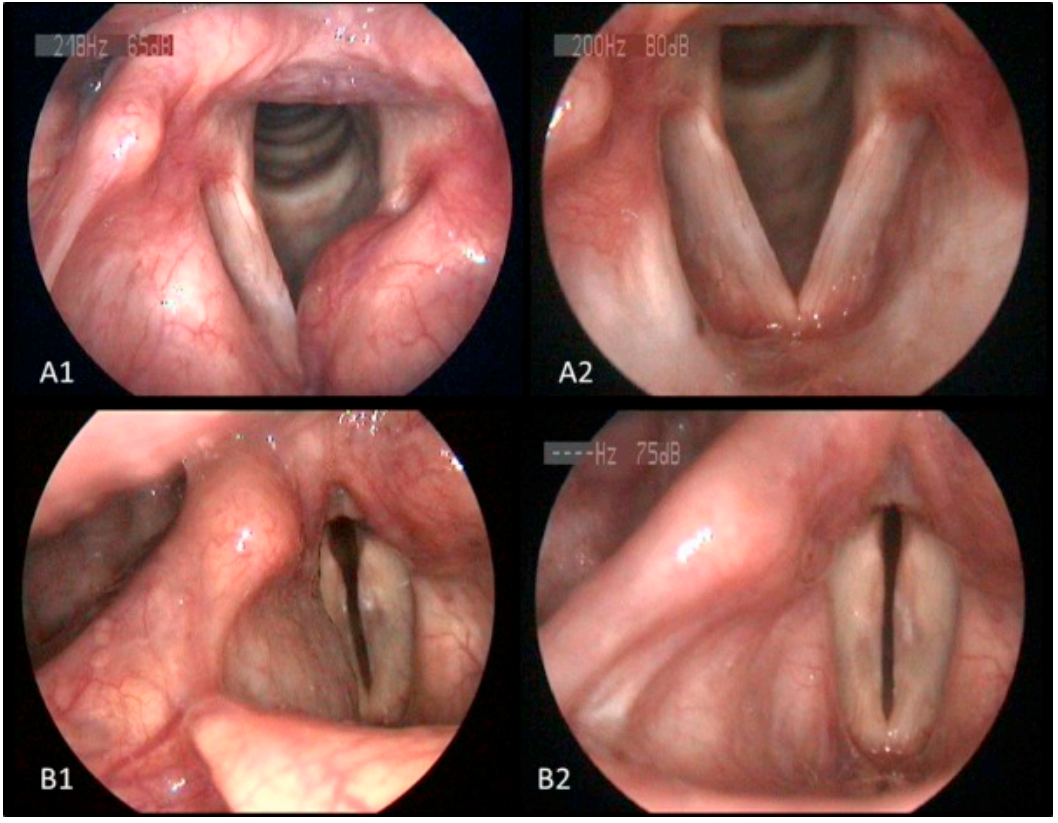
External laryngocele

plain X-ray with Valsalva reveals laryngocele

CT-scan appearance of laryngocele



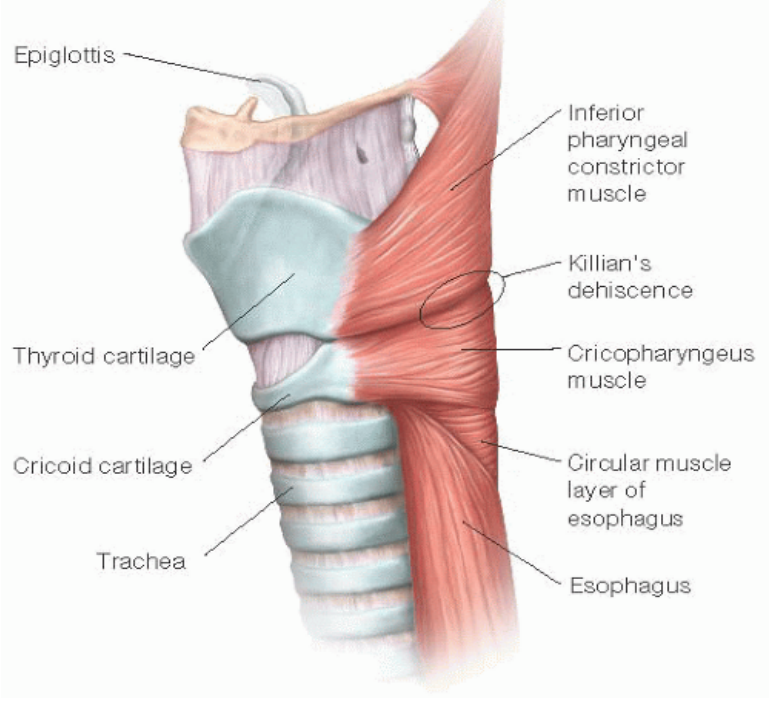
Laryngocele before and after surgery



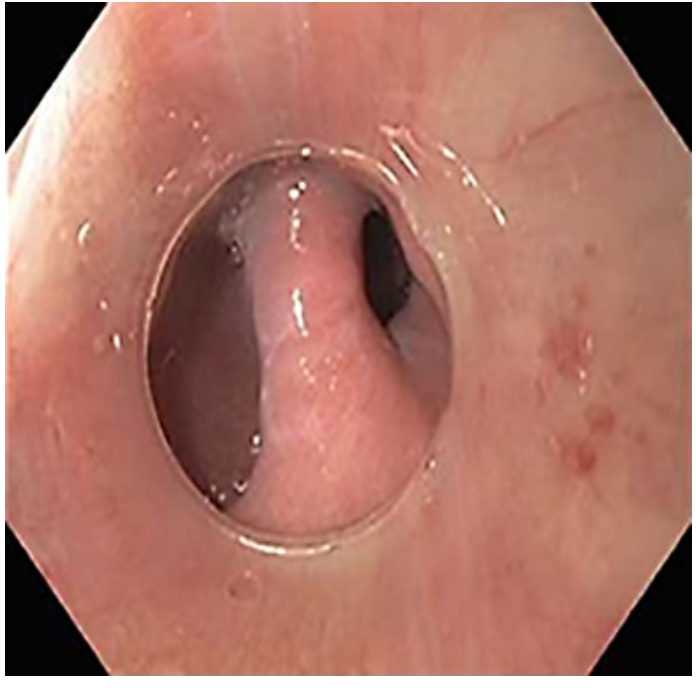
Diverticulum (Zenker's)

- Due to week area between oblique and transverse fibers of inferior constrictor muscle(killian dehiscence)
- Incidence 2:100000 per year
- More in western countries
- Age of presentation is over 70 years
- Risk factors; age, hiatus hernia, GERD
- Presenting symptoms; halitosis, dysphagia, weight loss, cough, regurgitation
- Diagnosis; BA swallow
- Treatment; surgery

Anatomical site of diverticulum(potential weak area in-between fibers of inferior constrictor muscle of pharynx-Killian's dehiscence



Endoscopic view and Barium swallow for diverticulum



Acquired neck masses

- **inflammatory:**

➢ acute: lymphadenitis, sialo adenitis, cervical abscesses

➢ chronic:

a. non-specific: lymphadenitis, sialo adenitis

b. chronic specific: Tuberculosis, syphilis, sarcoidosis

- **Neoplastic;**

➢ Benign; epithelial and non-epithelial

➢ Malignant; primary and secondary

- **Traumatic**

Traumatic masses

Hematoma

- Usually either due to direct blunt trauma to the neck or after neck surgery like neck dissection or thyroidectomy

- Diagnosis is straightforward
- Treatment : incision and drainage

Inflammatory Neck Masses

- Rubbery in consistency
- Tender
- Sudden growth
- Hot on palpation
- Well-defined edges
- Smooth
- Erythema over the mass.

Inflammatory masses

- **Acute inflammatory neck masses:**

  lymphnodes inflammation, sialo adenitis, neck cellulitis and abscesses.

- **Chronic inflammatory neck masses:**
- **non-specific:**

  lymphnodes inflammation and sialoadenitis

- **Chronic specific (granulomatous):**

  TB, Syphilis, Sarcoidosis, ectra….

Acute vs chronic

Chronic specific inflammatory neck mass

Acute inflammatory neck mass

Deep fascial spaces infection

- There are more than 20 deep fascial spaces in the neck, the largest are; parapharyngeal, submandibular, peritonsillar and retropharyngeal spaces
- Infection in these spaces cause neck masses
- initially cellulitis occurs and later ends in abscess formation
- Main clinical picture is; tender neck swelling, pain and stiffness of the neck
- Sometime airways may be compromised
- treatment is incision and drainage with antibiotics and analgesics

Deep fascial space abscess

parapharyngeal

submandibular

Sialoadenitis

- It is an inflammation of salivary glands
- Considered acute if the duration is less than 1 month and chronic if lasts more than 1 month
- Submandibular gland and parotid are the most common sites
- Symptoms: local pain and swelling, fever , malaise
- Treatment: analgesics, antibiotics

Tumors

Benign

- **Epithelial origin**;
- Papilloma, adenomas
- **Non-epithelial origin**;

Lipomas,
fibromas,
leiomyoma's,
paragangliomas
and others

Malignant

- **Primary**

lymphomas, squamous cell carcinomas, sarcomas, melanomas

- **Secondary**
- due to primary above the clavicle
- due to primary below the clavicle

Benign Tumors

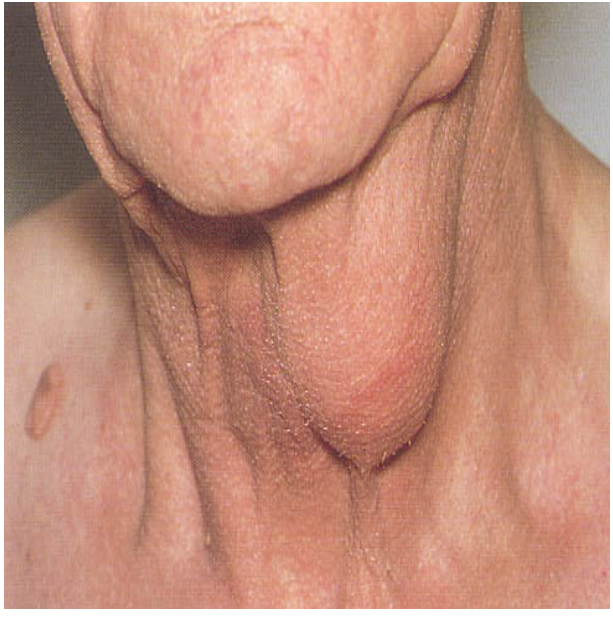
- Soft in consistency
- Very slow progressive
- Non-tender
- Smooth
- Well-defined edges

Common Benign Tumors

- **Lipoma**
- **paragangliomas (schwanomas)**
- **Adenomas**
- **Leiomyoma**
- **Papilloma**
- **Fibroma**

Lipoma

- Soft, non-tender asymptomatic
- Usually occurs >35 years of age
- Diagnosis; clinical, confirmed by histopathology
- Treatment; excisional biopsy



Carotid body tumor

- **Epidemiology;**
- Incidence 1:1000, In 10% familial, but the majority are sporadic. 70% unilateral
- Peak age incidence is middle age
- High altitudes and COPD are predisposing factors, Malignant changes less than 10%
- **Types;** locally invasive, non-invasive and metastatic
- **Clinical picture**; usually asymptomatic slowly growing (0,8 mm/year),pulsatile non-tender, rubbery, regular mass at the carotid bifurcation
- **Diagnosis;** VMA, Urine catecholamines, metanephrines, and radiological images
- **Treatment;** observation unless if fast growing needs surgery

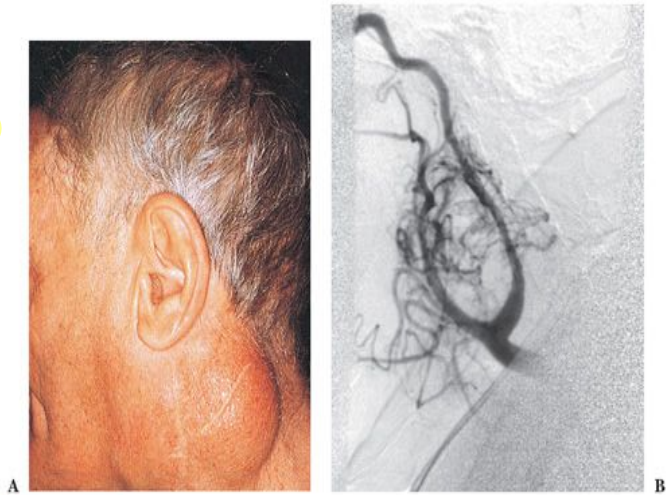


FIGURE 15.5 **(A)** A carotid body paraganglioma (CBP) in the left side of the neck of a 70-year-old man had been operated on years earlier, but the tumor was not successfully resected. **(B)** Carotid body paraganglioma from a different case is present in early arterial phase of carotid arteriography and causes a widening of carotid bifurcation with "lyre-like" splaying of both branches. Lateral view of carotid angiography.

Malignant Neck Masses

- **Characteristics:**

- **Hard**
- **Non-tender**
- **Rapidly progressive**
- **Sometime tethering with skin**
- **Occasionally matted together**

Malignant neck masses

- **Primary malignant tumors:**

  lymphomas, squamous cell carcinomas, sarcomas, melanomas

- **Secondary (metastatic) tumors:**
- Either due to primaries above clavicle
- Or due to primaries below clavicle

Lymphoma

- More common in children and young adults
- Up to 80% of children with Hodgkin's have a neck mass
- Hodgkin more common in children and young adults , while non-Hodgkin is more common among old age groups

Clinical picture of lymphoma

- **Symptoms:**

  Enlarged lymph node, Fever mainly at night, Sweating mainly at night, Itching, Enlarged spleen, Weight loss

- **Diagnosis:** based on clinical picture and biopsy

- **Treatment:** combined chemo- and radiotherapy with success rate more than 75%

Classification of lymphoma

- Hodgkin's
  - mixed cellularity
  - nodular sclerosis
  - lymphocyte depleted
  - lymphocyte predominant
- Non-Hodgkin's lymphoma
  - low grade B-cell
    - » small lymphocytic
    - » marginal zone
  - mantle cell (B-cell)
  - follicular (B-cell)
  - large B-cell
  - Burkitt's (B-cell)
  - lymphoblastic (mostly T-cell)
  - T/NK-cell
  - mycosis fungoides (cutaneous T-cell)

Subtypes of Non-Hodgkin lymphoma

High grade

- Diffuse Large B cell Lymphoma
- Burkitt Lymphoma

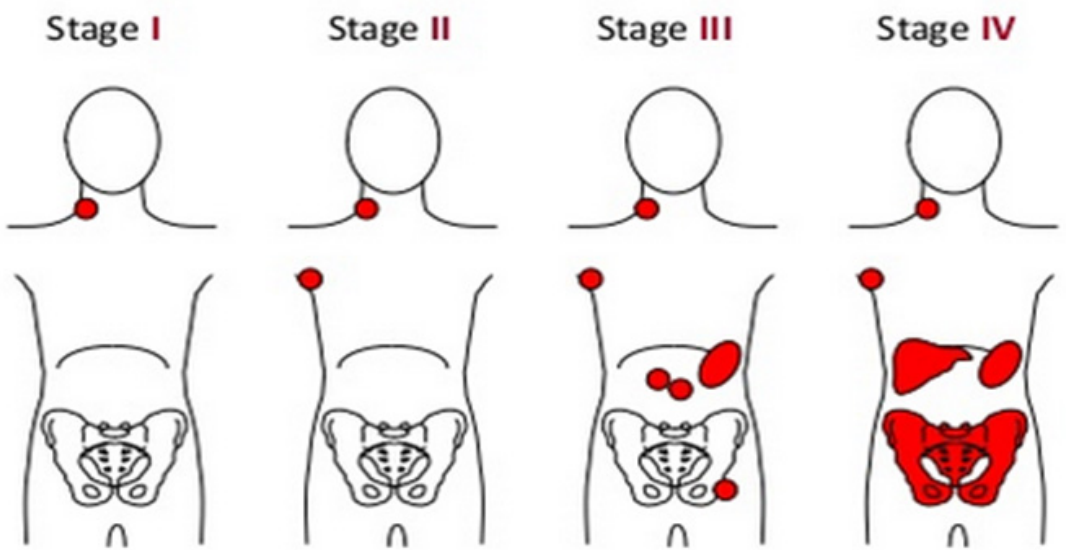
Low grade

- Marginal Zone Lymphoma
- Follicular Lymphoma
- Mantle Cell Lymphoma

High and low grade

- T Cell Lymphoma (all subtypes)

Staging of lymphoma



A: absence of B symptoms
B: fever, night sweats, weight loss

Metastatic neck Mass masses

- **Common primary sites above clavicle:**

  nasopharynx, tonsils, tongue base, pyriform fossa, supraglottic part of larynx

- **Common primary sites below clavicle:**

  breast, lung, liver, stomach, prostate.

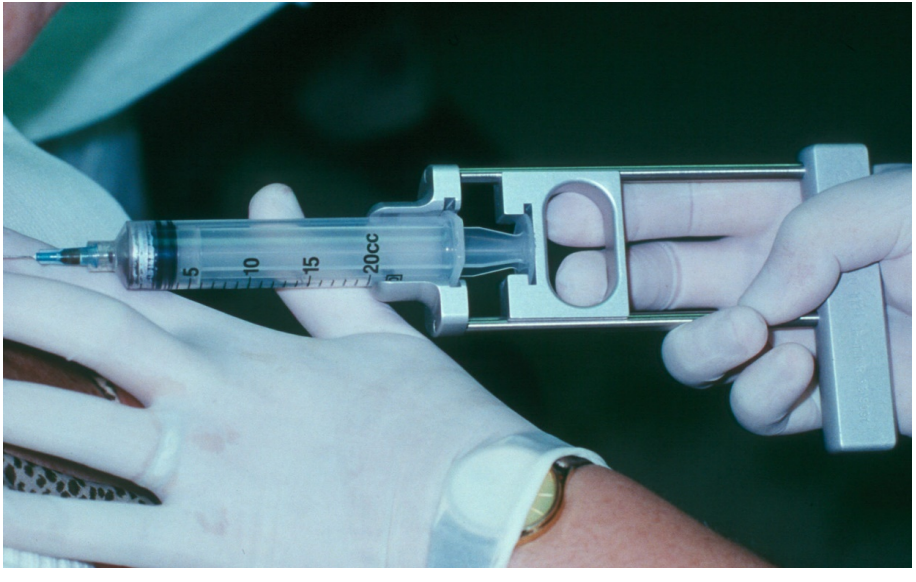
N Classification

- Nx: lymph nodes cannot be evaluated
- N0: no evidence of nodal metastasis
- N1: single ipsilateral node involved size ≤ 3cm
- N2:
  - N2a: single node involved size 3-6cm
  - N2b: multiple nodes involved unilaterally size ≤ 6cm
  - N2c: bilateral nodal involvement size ≤ 6cm
- N3: any nodal involvement size > 6cm

Plan of managing a highly suspicious neck mass

- When there is a highly suspicious neck mass the first thing to do is Fine Needle Aspiration , because it is a reliable (diagnostic in 90% of cases) and it is safe simple cheep and quick procedure

Fine Needle Aspiration Cytology (FNAC)



Plan after FNA

- **FNA Positive metastatic** ⇒ look for the primary
- if the primary is found treat both primary and secondary at the same time
- If primary is not found ⇒ take blind biopsy from highly suspicious sites
- if primary not found after blind biopsy ⇒ treat secondary by neck dissection and closely observe the patient for 5 years
- **FNA Negative** ⇒ repeat, if negative ⇒ open biopsy

positive on frozen section ⇒ neck dissection + follow-up

Options of Treatment

- **Radical (curative) treatment**

  factors indicate possibility of curing the patient

- **Palliative treatment**

  factors indicate no cure, but the aim is to improve the quality of patient's life

- **No treatment**

  patient dying (in terminal stage)

Treatment Tools

- Surgery;

  Radical neck dissection, modified neck dissection, functional neck dissection

- Radiotherapy:

  usual dosage 6000-8000 Rads

- Chemotherapy

- Combined therapy

Factors Affecting Treatment

A. **Patients factors:**

age, general conditions, preference

B. **Disease factors:**

type of malignancy, stage, differentiation

C. **Physician factors:**

experience, literature, facilities

General Rules in Managing Head and Neck Malignancies

- **Specialized Cancer management center**
- **Team work**;

  surgeons, radiotherapist, medical oncologist, speech therapist, physiotherapist, dietitian
- **Proper counseling**
- **Proper administrative planning**
- **Early stage disease**:

  single modality treatment while late stage needs combined treatment to improve prognosis
- **Young patients**;

  avoid chemo-radiotherapy if possible, while old patients surgery carries more mortality and morbidity

Summary

- Early recognition of malignancies is most important
- Extensive differential diagnosis
- old age of patient with smoking and alcohol consumption are important etiologic factors
- Accurate history and complete exam essential
- FNAB – invaluable diagnostic tool
- Possibility for malignancy in any age group
- Close follow-up and aggressive approach is best for favorable outcomes

Q & A