

# **Approach to neck masses**

- Evaluation of the neck mass must be approached in a thorough and disciplined manner. approach to evaluating a neck mass in adults relies upon findings on the initial history and
- physical examination to triage neck masses into three categories (**possible infectious, possible malignant, and possible inflammatory**) and directs further evaluation with laboratory tests,
  - imaging studies, tissue biopsies, and referrals accordingly

# History

- 1. Mode of onset
- 2. Duration
- 3. progression
- 4. exact site
- 5. pain
- 6. skin
- 7. associated features (fever, loss of wt, cough, chest pain....)

# History

- Dysphagia
- Odynophagia
- Change in voice
- Symptoms suggestive of hyperthyroidism
- Symptoms suggestive of hypothyroidism
- Systemic symptoms – weight loss, night sweats, anorexia
- Infectious symptoms – nausea/vomiting, fever, diarrhea
- Past medical history
- Personal history of malignancy
- Exposure to head and neck irradiation
- Exposure to tobacco, smoking, alcohol, and betel nuts
- Asks patient about ethnic origin (South East Asia)
- Personal history of thyroid disease
- Family history of thyroid disease
- Family history of head and neck cancer

## **PHYSICAL EXAMINATION**

Site

Size

Shape

---

Skin changes

Symmetry / Scars

Colour

Consistency – soft/firm/hard

Surface – smooth/irregular

Edge – well/poorly defined

Temperature / Tenderness / Fixation

Pulsatile ? Bruit ?

Change with swallowing ?

General examination

## **Exclude or treat bacterial infection**

Infectious neck masses are uncommon but must be promptly treated or excluded.

Infectious etiologies of a neck mass are suspected based on a history of the mass developing within a few days or weeks of an upper respiratory infection, dental infection, trauma, travel, or exposure to certain animals

or based on one or more of the following physical findings:

- **Warmth or erythema of the overlying skin**
- **tenderness to palpation of the mass**
- **Fever, tachycardia, or other systemic signs of infection**
- **Rhinorrhea, odynophagia, otalgia, odontalgia, or other symptoms of a head and neck infection**

## **Exclude malignancy**

Malignancy is the greatest concern in adult patients with a neck mass.

History:

---

- **Lack of an infectious etiology**
- **Duration of  $\geq 2$  weeks or unknown**

Physical examination:

- **Size  $> 1.5$  cm**
- **Firm texture to palpation**
- **Fixed or reduced mobility**
- **Ulceration of overlying skin**

## **Labs**

Most patients •should have:

**Complete blood count (CBC) with differential**

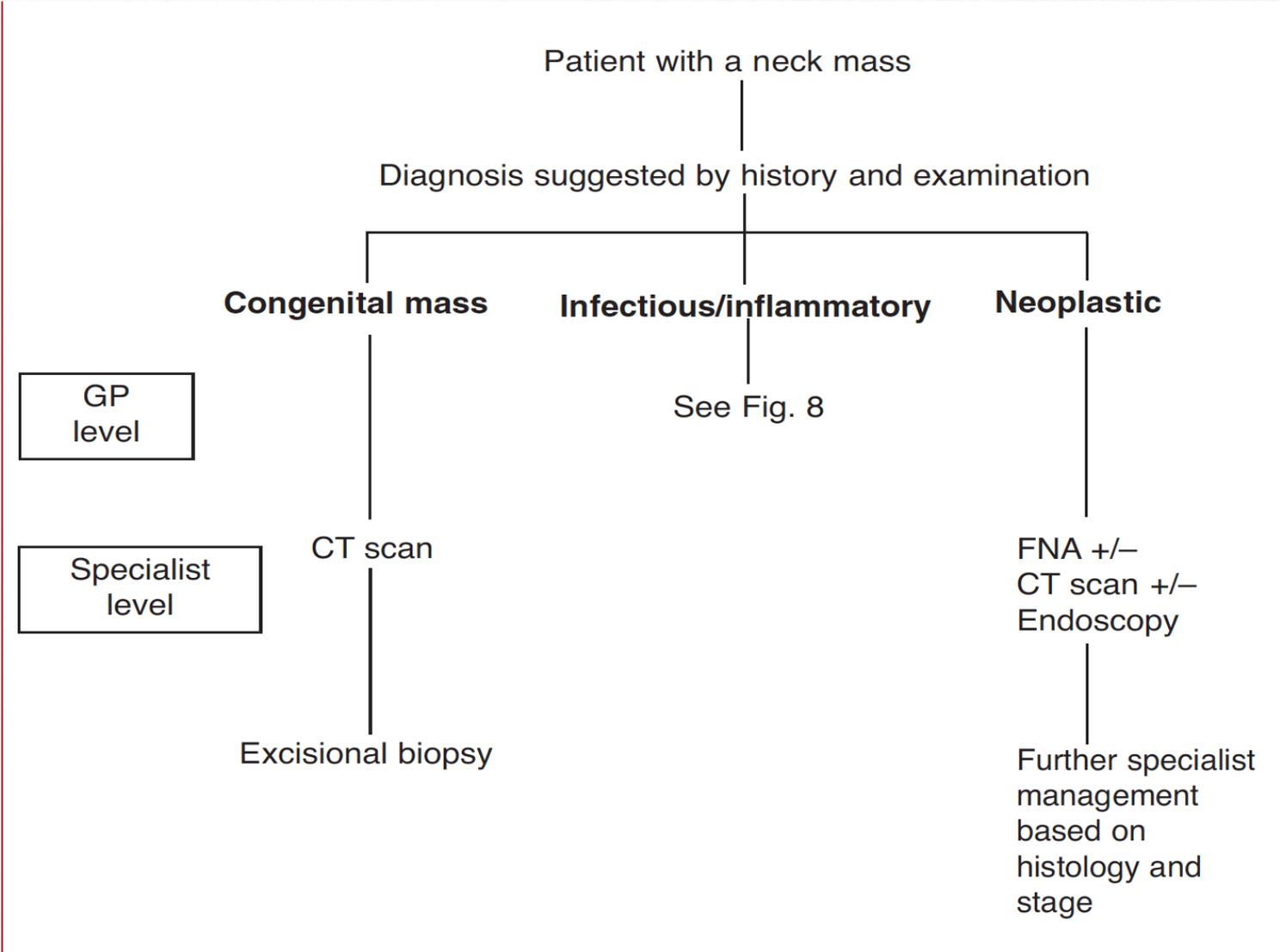
**The following may be indicated for some patients:**\_\_\_\_\_

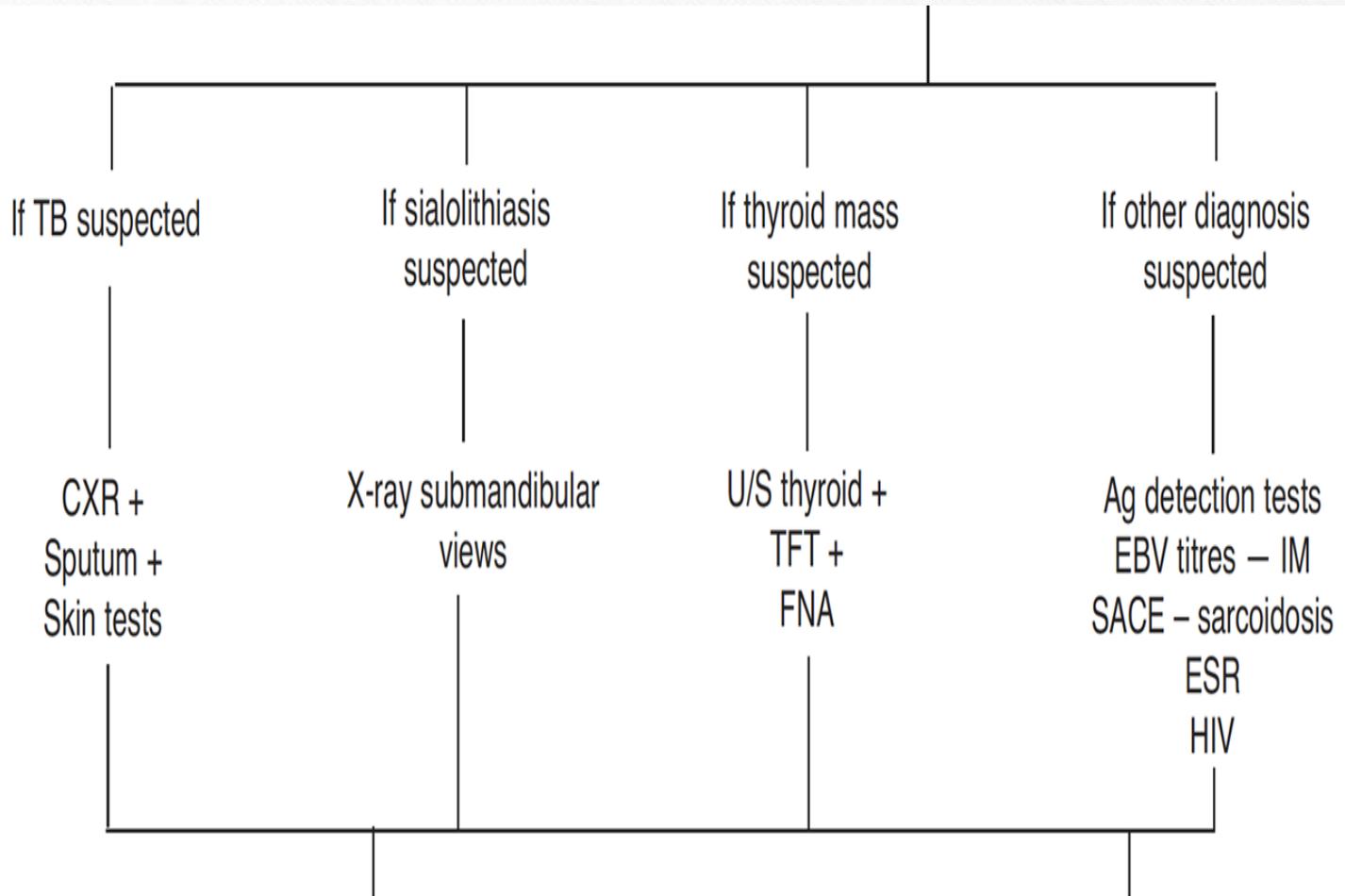
Erythrocyte sedimentation rate (ESR) and/or C-reactive protein (CRP) to evaluate for systemic inflammation or infection

Blood culture (for febrile patients)

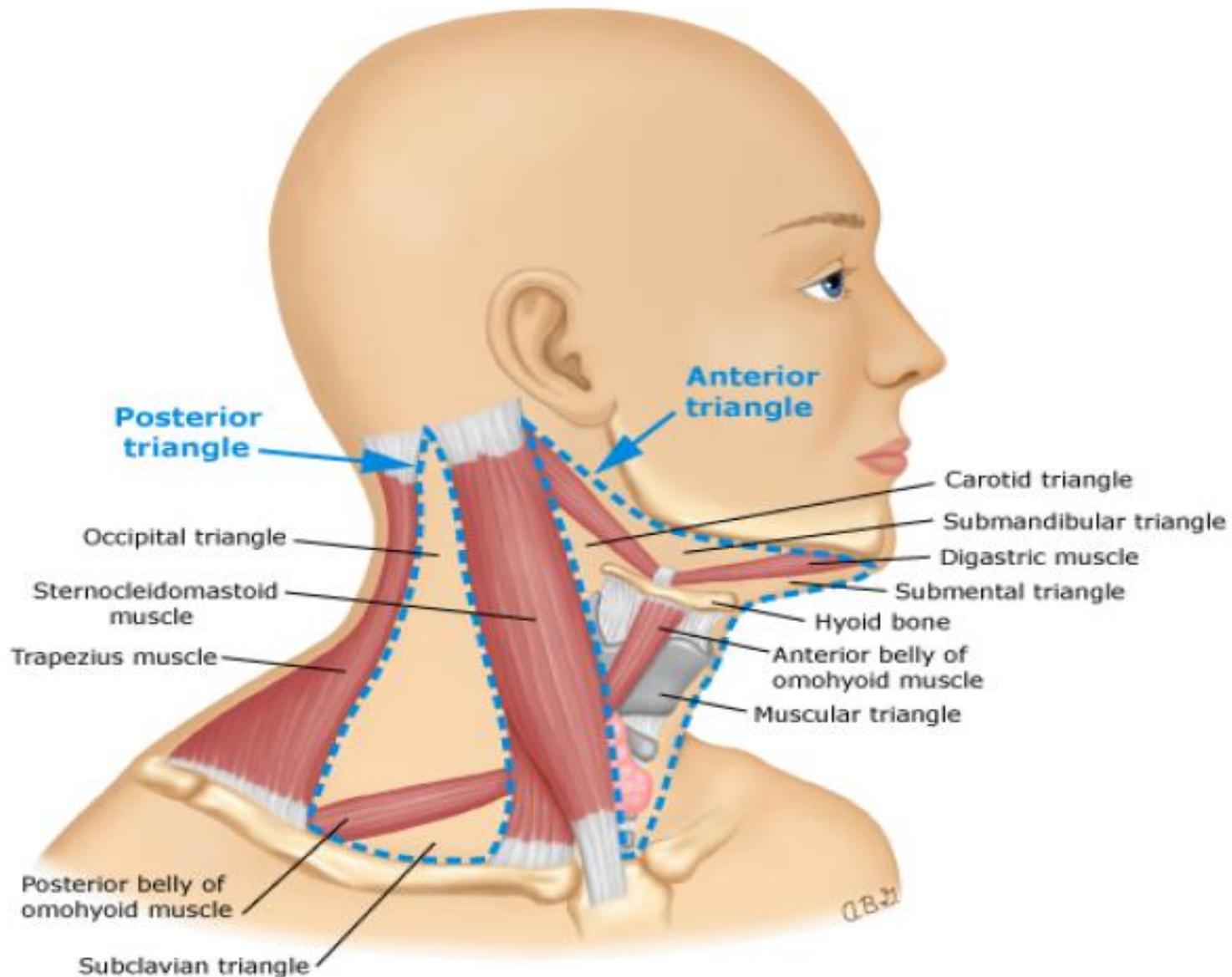
Epstein-Barr virus (EBV) or Cytomegalovirus (CMV) serology (when adenopathy is diffuse)

HIV serology (in patients with increased risk)

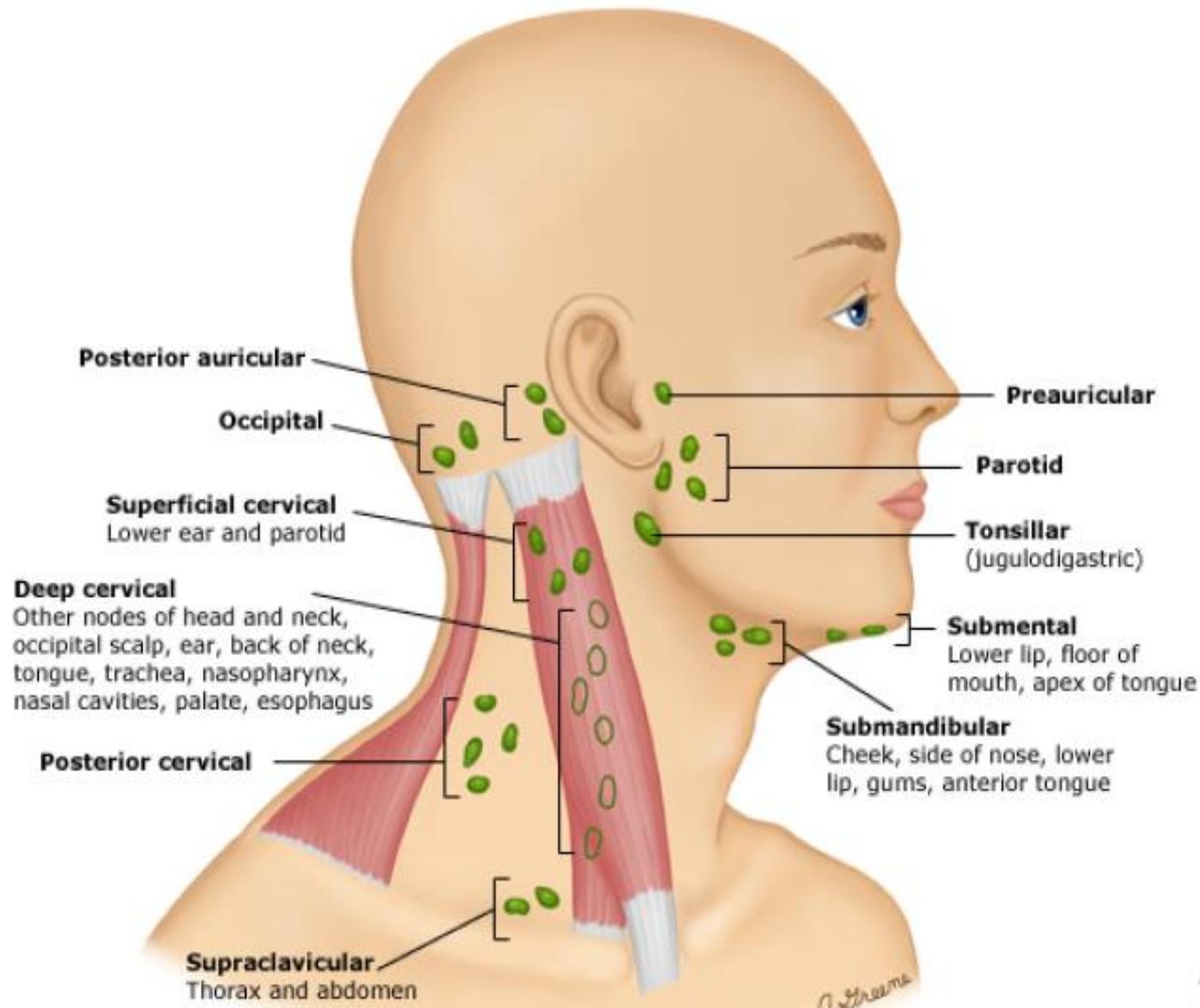




# Anatomical regions of the neck



# Lymph nodes of the head and neck



Superficial multiple swelling

# CERVICAL LYMPHADENOPATHY

- Enlargement of the cervical lymph glands **is the most common cause** of a swelling in the neck.
- The diagnosis of lymphadenopathy caused by systemic illness such as glandular fever, toxoplasmosis and sarcoidosis depends on finding lymphadenopathy elsewhere, on other evidence of the underlying disease and on special blood tests

## Causes of cervical lymphadenopathy

### Infection

Non-specific

Glandular fever

Tuberculosis

Syphilis

Toxoplasmosis

Cat-scratch fever (*Rochalimaea henselae*)

### Metastatic tumour

From the head, neck, chest and abdomen

### Primary reticuloses

Lymphoma

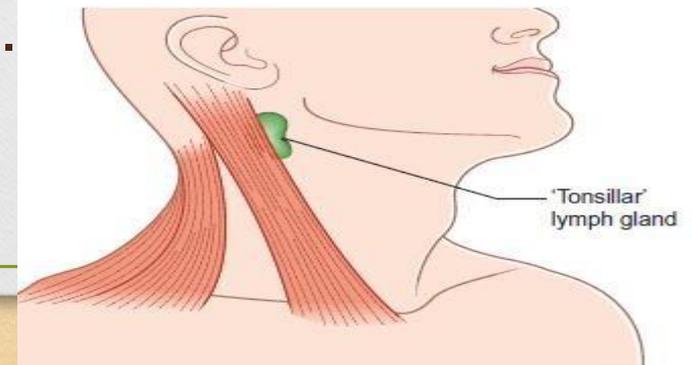
Lymphosarcoma

Reticulosarcoma

### Sarcoidosis

# NON-SPECIFIC CERVICAL INFLAMMATORY **LYMPHADENOPATHY**

- Non-specific inflammatory lymphadenopathy commonly follow recurrent bouts of tonsillitis, especially if the attack have been treated inadequately.
- **Reactive viral** lymphadenopathy is the **most common cause of cervical lymphadenopathy, especially in children**. Typically, viral lymphadenopathy arises in the setting of routine upper respiratory infections caused by adenovirus, rhinovirus, or enterovirus.



➤ On history and physical examination

- I. **AGE** : When associated with tonsillitis, the majority of ages below 10 years, other reactive conditions can occur at any age
- II. **Local symptoms** : painful lump just below the angle of the jaw, the child may snore at night, have difficulty in breathing, have nasal speech because of tonsillar and adenoid hyperplasia
- III. **Systemic symptoms** : when the lump is tender the patient often feels ill, has a sore throat and pyrexia

## ➤ Examination

- I. **Position** Lymph from the tonsils drains to the upper deep cervical lymph glands. The gland just below and deep to the angle of the mandible is often called the tonsillar gland
- II. **Tenderness** If the infection is active, the enlarged glands will be tender.
- III. **Shape and size** The tonsillar gland is usually spherical and approximately 1–2 cm in diameter. It is rarely bigger than this.
- IV. **Composition and relations** Each gland is firm in consistency, solid, discrete, tender and not very mobile.
- V. **Local tissues** The tonsils are likely to be enlarged and hyperaemic. Pus may be seen exuding from the surface crypts.
- VI. **General examination** Look for the presence of enlarged lymph glands elsewhere. None should be enlarged.

# TUBERCULOUS CERVICAL LYMPHADENITIS

- The human tubercle bacillus can enter the body via the tonsils, and from there move to the cervical lymph glands.
- The **upper deep cervical glands** are most often affected. There is no generalized infection, so there is little systemic disturbance of health



Fig. 12.4 A tuberculous cervical lymph gland in a young immigrant adult.

## ➤ **On history and physical examination**

- I. **Age and ethnic groups** Tuberculosis lymphadenitis is common in children, young adults and the elderly
- II. **Symptoms** The patient complains of a lump in the neck. This appears gradually with or without pain. The pain can be intense if the glands grow rapidly and necrosis.
- III. **Systemic symptoms** are unusual in the young, but the elderly sometimes have anorexia and slight weight loss.
- IV. If the glands break down into an abscess, the swelling increases in size, becomes more painful, and the patient notices discoloration of the overlying skin.

## ➤ On examination

The signs of tuberculosis lymphadenitis

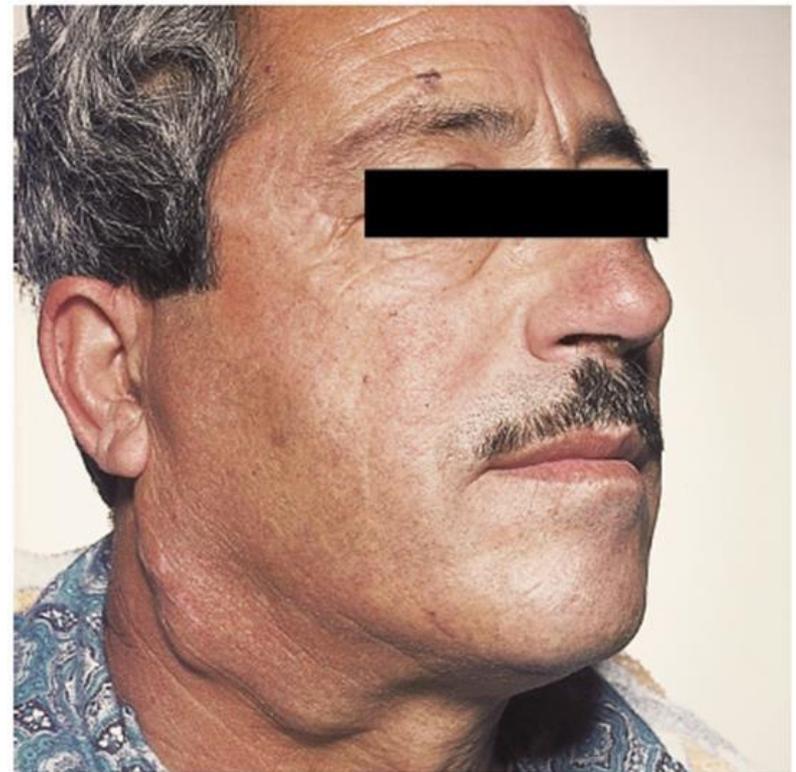
- I. **Position** The **upper and middle deep** cervical glands are most often involved
- II. **Temperature** The mass of glands does **not feel hot**.
- III. **Tenderness** The glands are often **slightly tender**, but pain is not a prominent feature.
- IV. **Color** If there is no abscess present, the overlying skin should look **normal**.
- V. **Shape, size and consistency** In the early stages, the glands are firm, discrete and **between 1 and 2 cm in diameter**
- VI. **General examination** In tuberculosis lymphadenitis, there are often **no systemic abnormalities**, but when a tuberculosis **abscess** develops, there may be tachycardia, pyrexia, anorexia and general malaise.

## CARCINOMATOUS LYMPH GLANDS

- **Malignant metastatic deposits** in the cervical lymph glands are **the most common cause** of cervical lymphadenopathy **in adults**.
- The **primary tumour is most often in the buccal cavity** (tongue, lips and mucous membrane) and larynx, but every possible primary site must be examined when cervical glands are enlarged by secondary deposits, including the skin.

## Sites of primary neoplasms that metastasize to cervical lymph glands

- 1 Scalp
  - Parotid gland
  - Upper face
  - Ear
- 2 Maxillary antrum and other air sinuses
  - Nasal cavity and nasopharynx
- 3 Tongue
  - Buccal mucosa
  - Floor of mouth
  - Mandible
- 4 Lips
- 5 Tonsil
  - Base of tongue
  - Oropharynx
- 6 Submandibular gland
  - Skin of neck
- 7 Larynx and laryngopharynx
- 8 Thyroid
  - Upper oesophagus
- 9 Upper limb and both sides of the chest wall
- 10 Breast
- 11 Lungs, stomach and all the viscera



**Fig. 12.9** This patient presented with hard, enlarged lymph glands in the neck. The primary lesion was the insignificant mole above his right eyebrow.

## ➤ On history and physical examination

**Age :** Most head and neck cancers occur in patients **over the age of 50 years.**

---

**Sex :** Most of the head and neck cancers, other than those of the thyroid, are more **common in males** than females.

**Local symptoms:** The patient complains of a **painless lump** in the neck.

**General symptoms:** The patient may have symptoms from the primary lesion in the head or neck, such as a sore tongue, a hoarse voice or a separate lump in the neck such as in the thyroid or salivary glands.

## ➤ On examination

**Site:** The site of the affected glands gives a crude indication of **the** site of the primary. Lesions above the hyoid bone drain to the upper deep cervical glands. The larynx and thyroid drain to the middle and lower deep cervical glands. An enlarged supraclavicular lymph gland commonly indicates intra-abdominal or thoracic disease.

---

**Color** The overlying skin is a **normal color** unless the mass is so large that it stretches or infiltrates the skin, which makes it pale or blotchy red .

**Temperature** The skin temperature will be normal unless the tumor is very vascular.

**Tenderness** Glands containing secondary deposits are usually **not tender**.

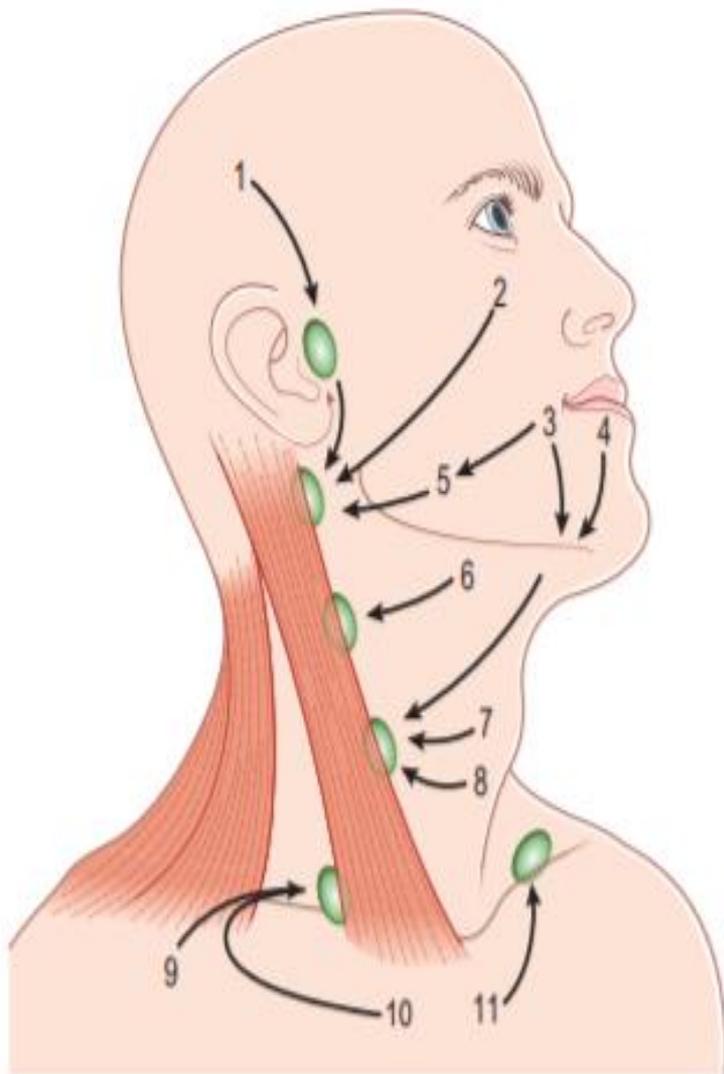
**Shape and size** Glands containing metastases vary in size and shape. At first the glands are smooth, discrete and vary in size. As they grow, they may coalesce into one large mass.

**Composition** : Glands containing tumour are hard, often stony hard.

**Relations** : The glands are tethered to the surrounding structures, so they can usually be moved in a transverse direction but not vertically. Secondary cancer is more common in the glands of the anterior than the posterior triangle.

**General examination** Examine all the sites that might contain the primary lesion in particular:

- the skin of the scalp, the ear and the external auditory meatus;
- the lips, tongue, buccal mucous membrane and tonsils;
- the nose, maxillary antra and nasopharynx;
  - the thyroid gland; ● the salivary glands;
- the skin of the upper limb;
  - the breasts;
- the lungs;
  - the stomach, pancreas, ovaries and testes.



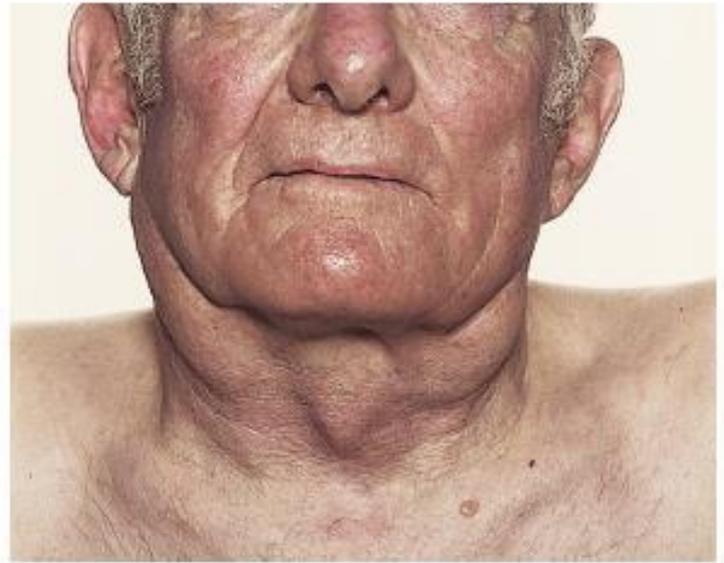
**Fig. 12.11** Sites of primary neoplasms that metastasize to the cervical lymph glands.



**Fig. 12.10** Secondary malignant deposits in the skin of the neck.

# PRIMARY NEOPLASMS OF THE LYMPH GLANDS

- The **most common primary** tumour of lymphoid tissue is **malignant lymphoma**.
- There are many histological varieties, but they are often loosely divided into Hodgkin's and non-Hodgkin's lymphoma.



**Fig. 12.12** Bilateral cervical lymphadenopathy caused by Hodgkin's lymphoma.

---

# Deep anterior triangle swelling

don't move with swallowing

# BRANCHIAL CYST

- Branchial cleft cysts are congenital epithelial cysts, which arise on the lateral part of the neck from a failure of obliteration of the second branchial cleft in embryonic development.
- It is lined with squamous epithelium, but there are often patches of lymphoid tissue in the wall that are connected with the other lymph tissue in the neck and can become infected.

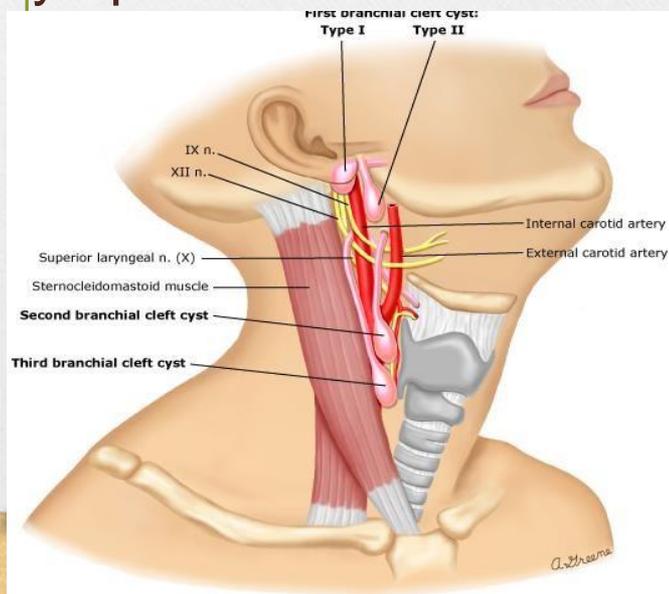


Fig. 12.15 A branchial cyst presenting in childhood.

## ➤ On history and physical examination

**Age** Although these cysts are present at birth. The majority present between the ages of 15 and 25 years.

**Sex** Males and females are **equally** affected.

**Symptoms** The common presenting complaint is a **painless swelling** in the upper lateral part of the neck. pain usually caused by infection in the lymphoid tissue in the cyst wall. A **severe throbbing pain**, exacerbated by moving the neck and opening the mouth, develops if the contents of the cyst become **infected and purulent**.

**General effects** These cysts have no systemic effects and are not associated with any other congenital abnormality.

## ➤ On physical examination

**Position** A branchial cyst lies along the anterior edge of the upper third of the sternomastoid muscle and bulges forwards

**Colour and tenderness** The overlying skin may be **reddened** and tender if the cyst is **inflamed**.

**Shape** The cyst is usually ovoid.

**Size** Most branchial cysts are between 5 and 10 cm long.

**Surface** Their surface is **smooth** and the edge distinct.

**Composition** The consistency varies with the tension of the cyst. Most cysts are **tense**. They are **dull to percussion**.

The lump **fluctuates**, but this sign is not always easy to elicit.

Such cysts may **transilluminate**

- Secondary infections can occur, producing enlargement, cellulitis, and neck abscess. If the cyst becomes infected, it becomes erythematous and tender.
- Management of branchial cleft cysts begins with **controlling infection**, if present. Once the infection has resolved, the mass and its cleft are usually **excised to prevent future problems**.

# CAROTID BODY TUMOR

- The carotid body, which originates in the neural crest, is important in the body's acute adaptation to fluctuating concentrations of oxygen, carbon dioxide, and pH.
- Paragangliomas of the carotid body are highly vascular, slowly growing typically benign tumors that can present as a neck mass.
- Carotid body tumors are often pulsatile and a bruit can be heard on auscultation.
- These tumors develop within the adventitia of the medial aspect of the carotid bifurcation.

## ➤ On history and physical examination

**Age** between the ages of 40 and 60 years.

**Symptoms** The common presentation is a **painless**, slowly growing lump. The patient may notice that the lump **pulsates**,

**Development** The lump grows so **slowly** that many patients ignore it for many years.

**Multiplicity** Carotid body tumors may be **bilateral**.

## ➤ On physical examination

**Position** Carotid body tumors are found in the upper part of the anterior triangle of the neck, level with the hyoid bone and beneath the anterior edge of the sternomastoid muscle

---

**Tenderness, color and temperature** These tumors are **not tender** or **hot**, and the overlying skin should be **normal**.

**Shape** The lump is initially spherical but, as it grows, it becomes **irregular** in shape, often narrower at its lower end, where it is situated in the bifurcation of the common carotid artery.

**Size** Carotid body tumours may vary from 2–3 cm to 10 cm in diameter.

**Composition** The majority of these tumours are **solid and hard**. They are **dull** to percussion and do not fluctuate. They are often called **potato tumours** because of their consistency and shape.



**Fig. 12.21** A very large, firm, bosselated carotid body tumour – hence the name 'potato tumour'.

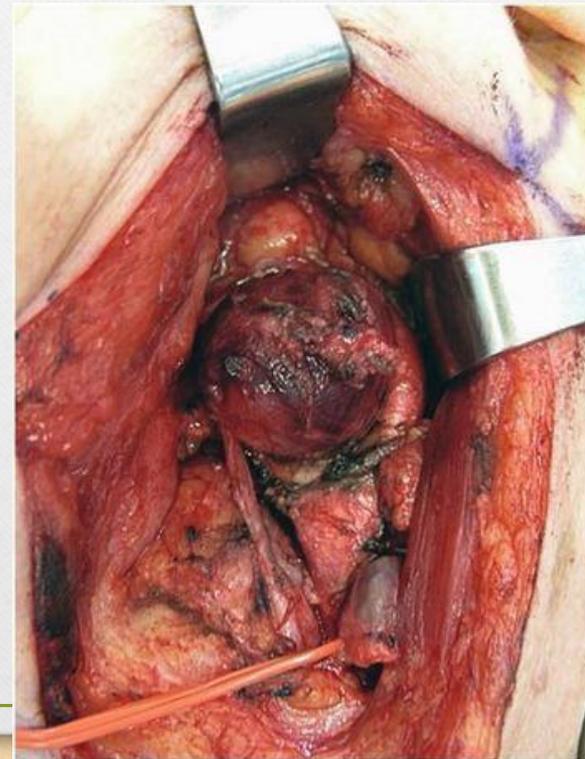
- **Diagnosis** is usually made based on characteristic features demonstrated on MRI/MRA imaging (salt and pepper appearance)

## Carotid body tumour

- Investigation
  - CT: homogenous, hypervascular, well defined strongly enhancing mass at carotid bifurcation with splaying of ICA and EAC
  - Lyre's sign



- surgery is usually the treatment modality of choice for younger, healthier patients with carotid body tumors (CBTs), and radiotherapy is reserved for the elderly, patients who are poor surgical candidates.



Deep posterior triangle swelling

# CYSTIC HYGROMA

- Lymph cyst, lymphocele, lymphangioma)
- A cystic hygroma is a **congenital collection of lymphatic** sacs that contain clear, colourless lymph.
- They are probably derived from clusters of lymph channels that failed, during intrauterine development, to connect with and become normal lymphatic pathways.
- Lymph cysts commonly occur near the root of the arm and the leg (i.e. in the anatomical junctions between the limbs and head and the trunk).

## ➤ On history and physical examination

**Age** The majority of cystic hygromas present **at birth** or **within the first few years of life**, but they may stay empty until infection or trauma in adult life causes them to fill up and become visible.

**Symptoms** The only symptom is the complaint about the lump and disfigurement caused by the cyst.

## ➤ On physical examination

**Position** Cystic hygromas are commonly found around the base of the skull usually in the posterior triangle, but they can be very big and occupy the whole of the subcutaneous tissue of one side of the neck.

**Temperature and tenderness** They are not hot or tender, and the overlying skin is normal.

**Shape** A cystic hygroma is a mixture of soft unilocular and multilocular cysts, so the whole mass looks lobulated and flattened.

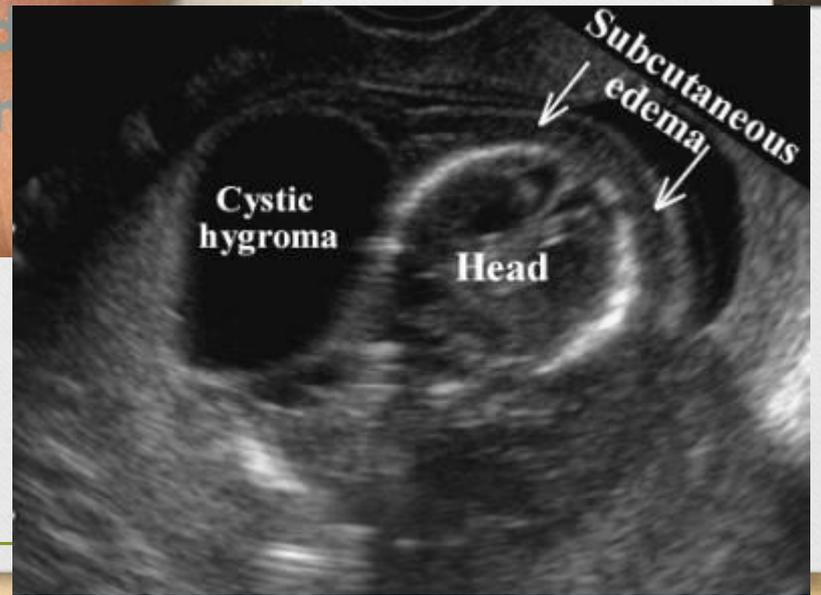
**Size** Small cysts are a few centimetres and larger.

**Surface** If the cysts are close to the skin, it may be possible to feel a distinct surface. Deep cysts feel smooth, their edges are often indistinct.

**Composition** Cystic hygromas are soft and dull to percussion. They fluctuate easily, but their distinctive physical sign is a translucence.



Baby can not turn his head right due to large swelling



# PHARYNGEAL POUCH (ZENKER'S DIVERTICULUM)

- A pharyngeal pouch is a 'pulsion' diverticulum of the pharynx through the gap between the horizontal fibres of the cricopharyngeus muscle below and the inferior constrictor muscle above.

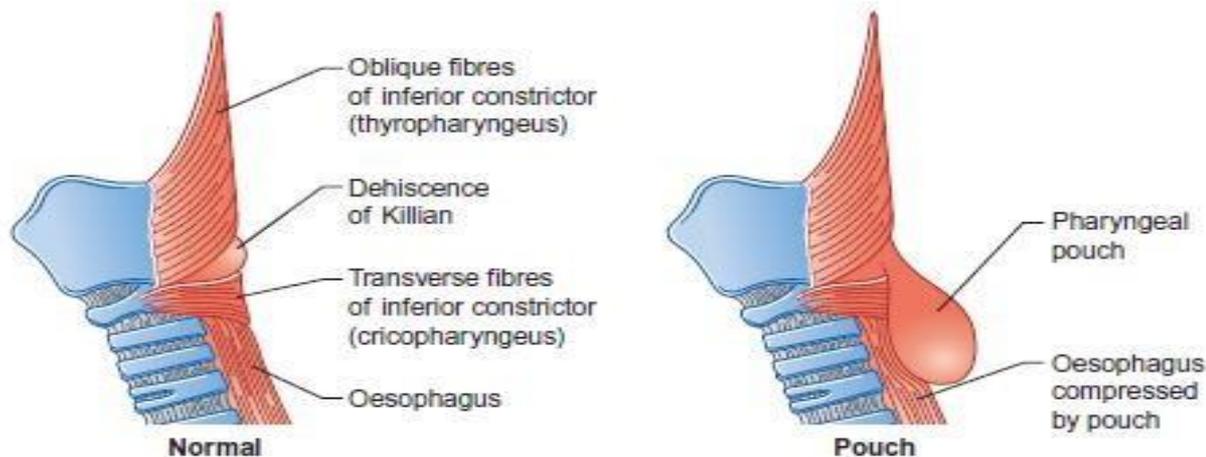


Fig. 12.26 The anatomy of a pharyngeal pouch.

- Pharyngeal pouches appear in middle and old age.
- They are more common in males than in females.
- Patients often have a long history of halitosis and recurrent sore throats before noticing the common presenting symptom of regurgitation of food.
- Regurgitation at night causes bouts of coughing and choking, and if pieces of food are inhaled a lung abscess may develop.
- As the pouch grows, it presses on the oesophagus and causes dysphagia.
- By the time these symptoms become severe, the patient notes a swelling in the neck.

- Diagnosis made by hx and PE.
- Investigations include, barium swallow and upper endoscopy.
- Treatment:
  - ❑ Cricopharyngeal myotomy and diverticulectomy.
  - ❑ endoscopic stapling.

