The NECK

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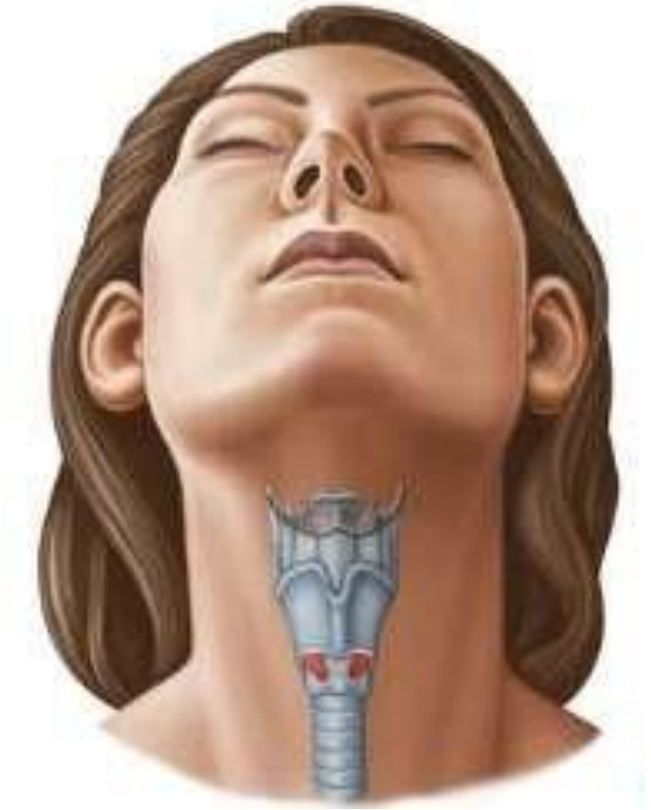
The Neck

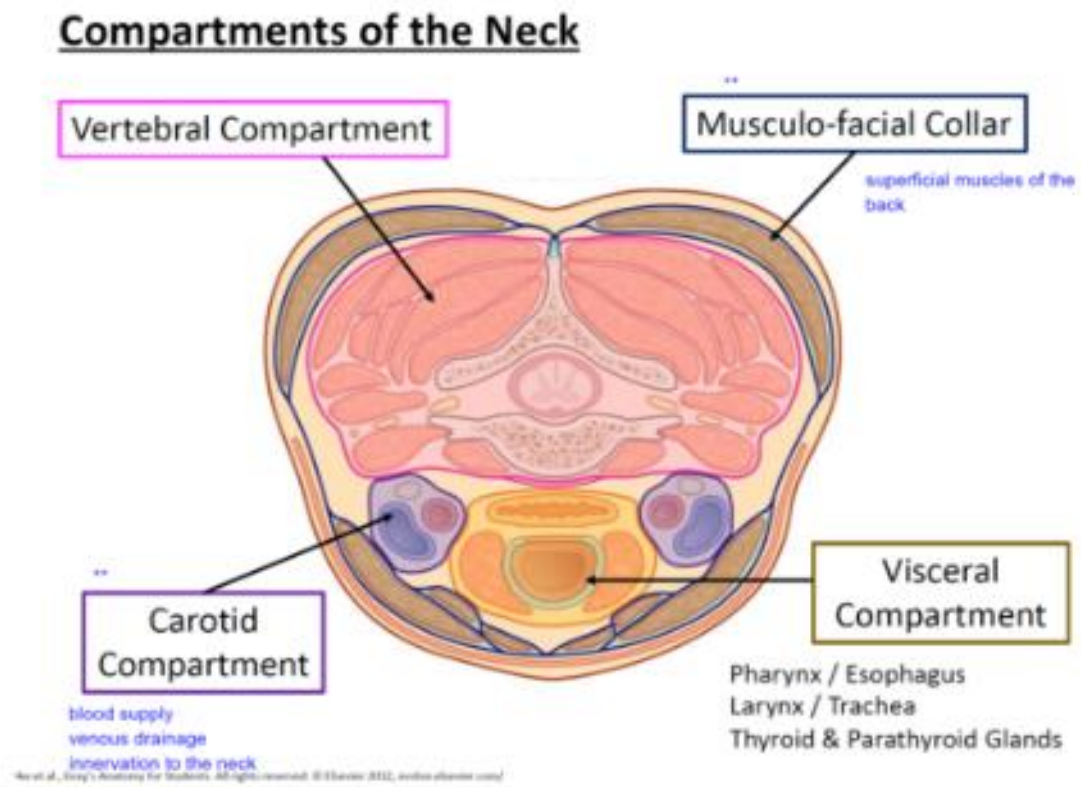
The neck is the part of the body on many vertebrates that connects the head with the body and provides the mobility and movements of the head.

The structures of the human neck are anatomically grouped into four compartments; **vertebral, visceral and two vascular compartments**



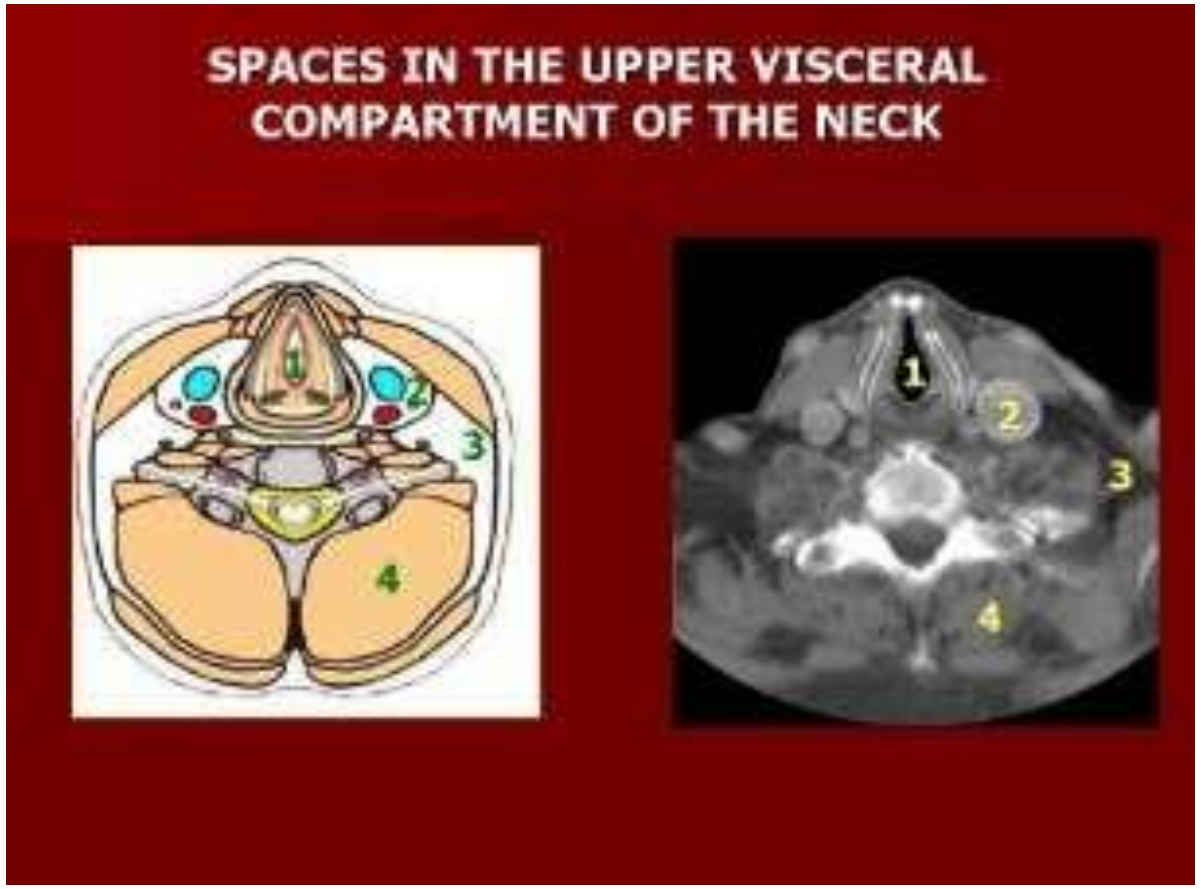
Visceral compartment

Visceral compartment accommodates the thyroid and parathyroid glands, trachea, larynx, pharynx, .



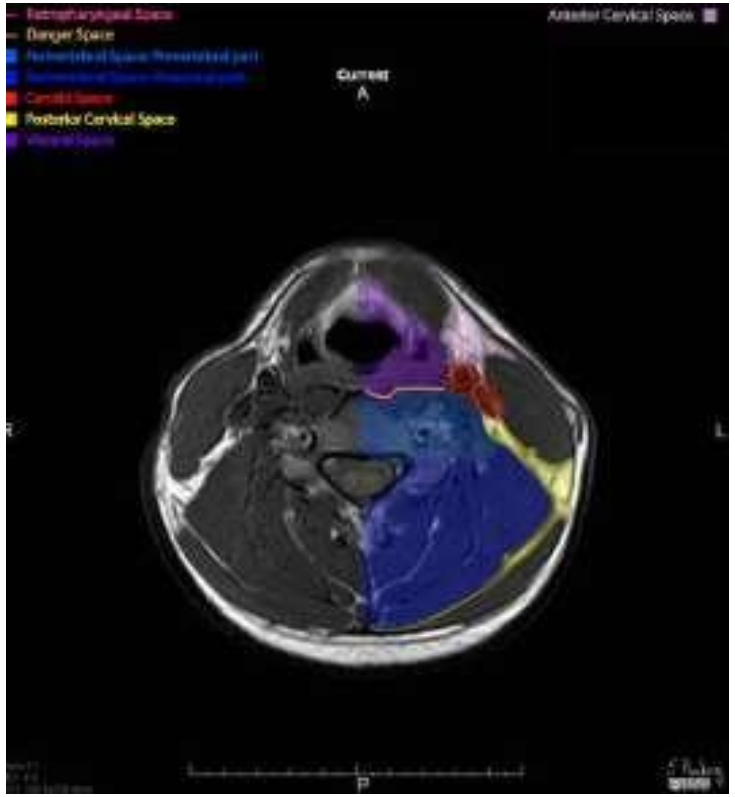
Vertebral compartment

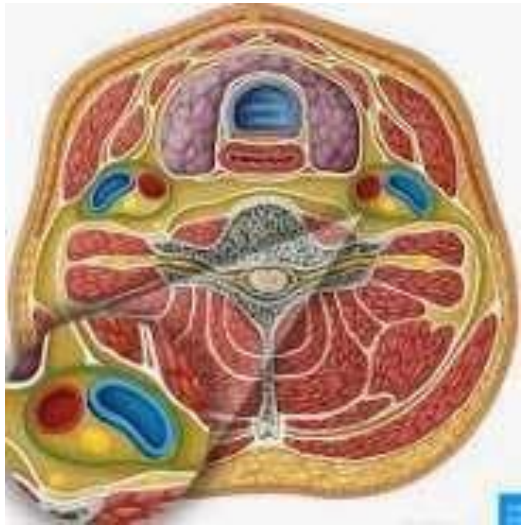
Vertebral compartment contains the cervical vertebrae with cartilaginous discs between each vertebral body. The alignment of the vertebrae defines the shape of the human neck. As the vertebrae bound the spinal canal, the cervical portion of the spinal cord is also found within the neck.



Vascular compartment

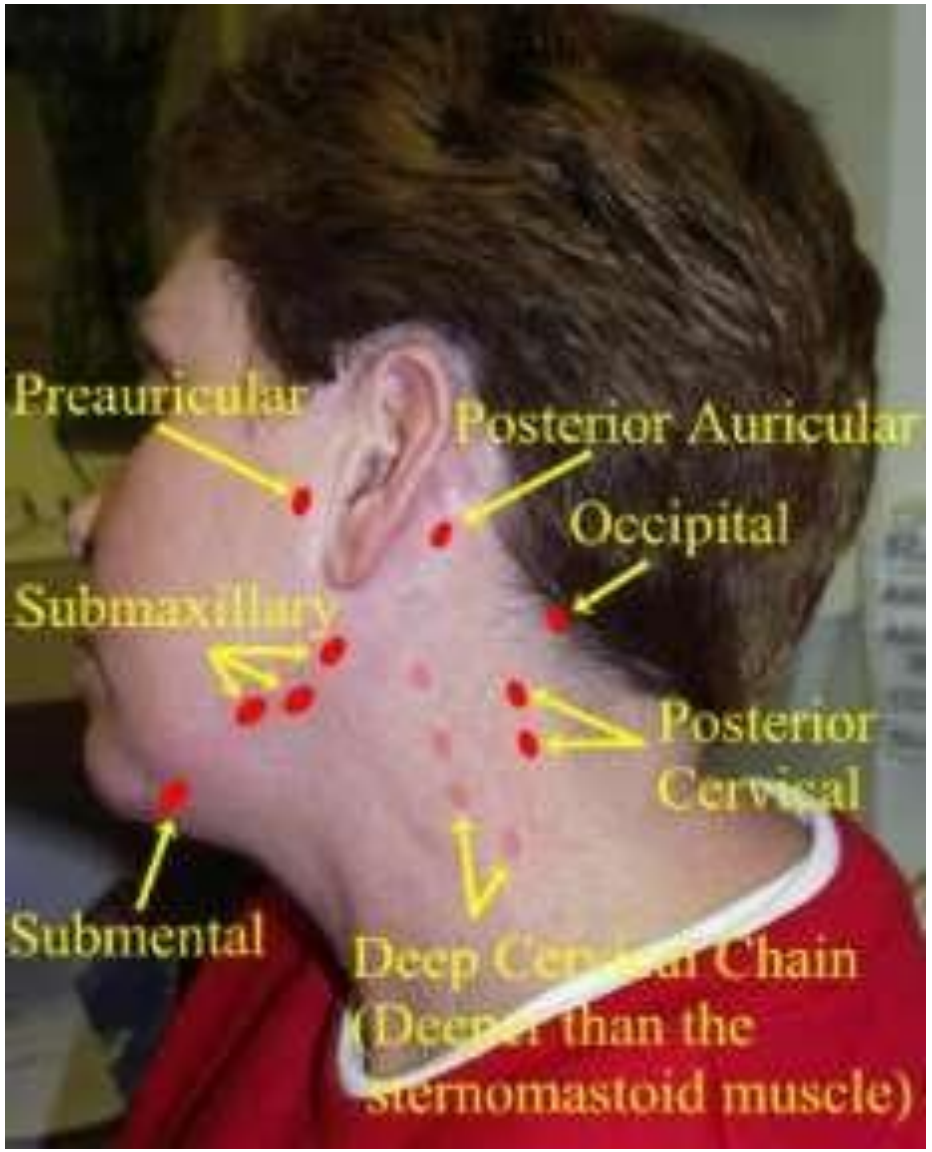
Vascular compartment is on both sides and consists of the two carotid sheaths found on each side of the trachea. Each carotid sheath contains the vagus nerve, common carotid artery and internal jugular vein.





lymph nodes

the neck contains cervical lymph nodes which surround the blood vessels.



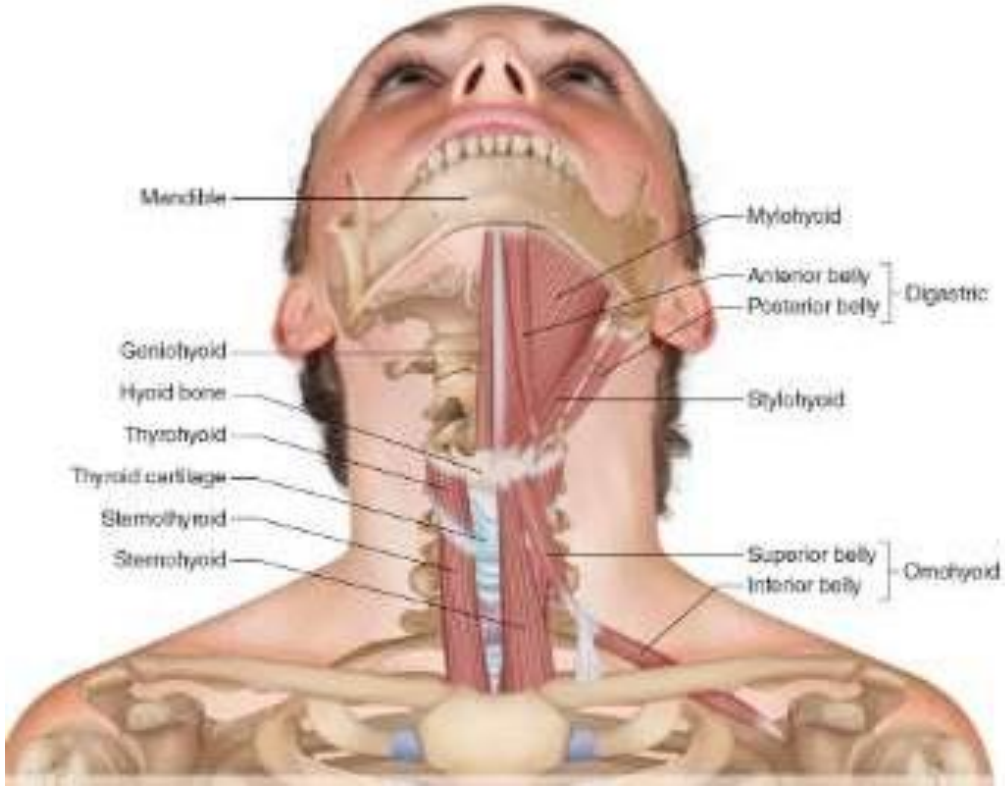
The hyoid bone

The hyoid bone (lingual bone or tongue-bone) is a horseshoe-shaped bone situated in the anterior midline of the neck between the chin and the thyroid cartilage.

At rest, it lies at the level of the base of the mandible in the front and the third cervical vertebra (C3) behind .

It is the only bone in the human body that is not connected to any other bones nearby.

The hyoid bone **provides attachment** to the muscles of the floor of the mouth and the tongue above, the larynx below, and the epiglottis and pharynx behind.

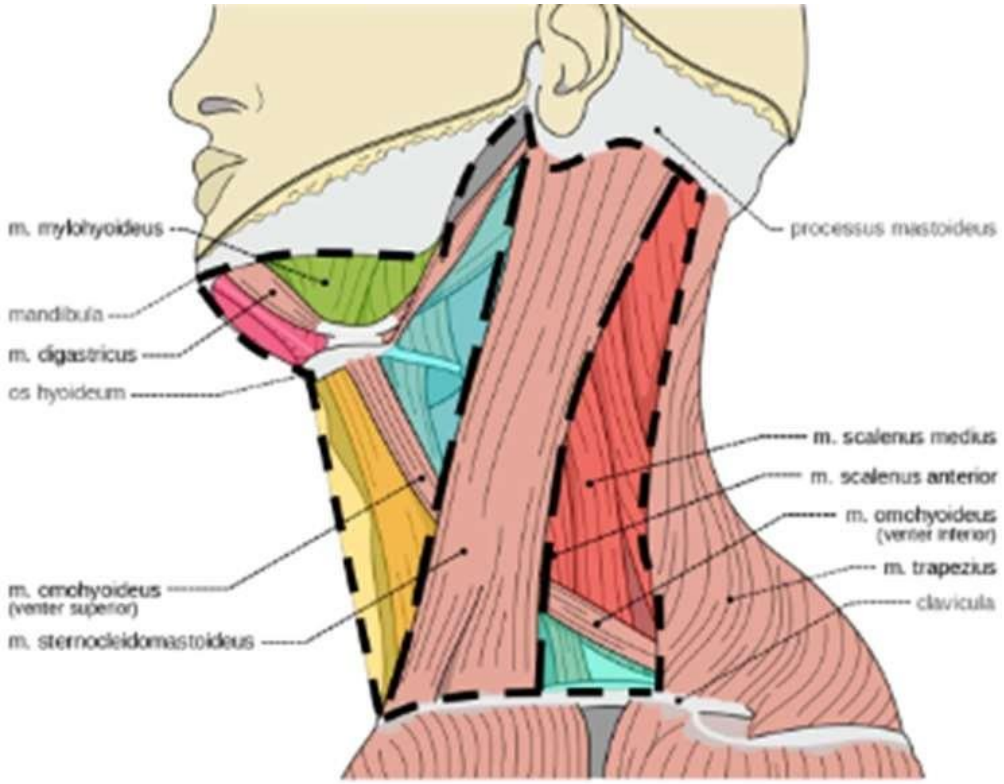


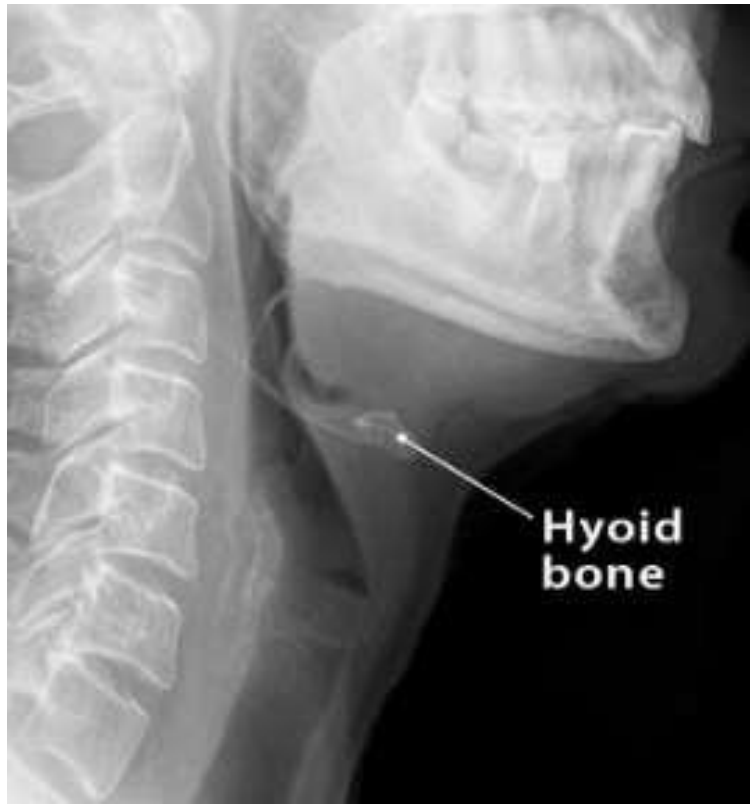
Muscles and triangles

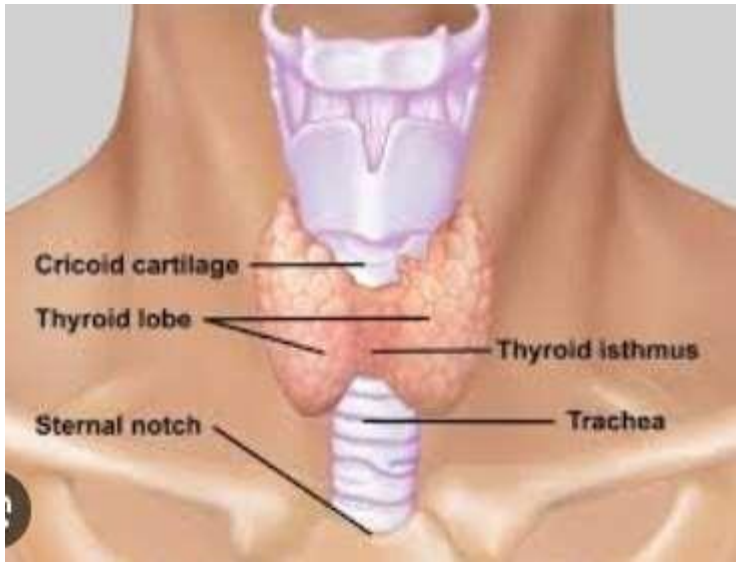
Muscles of the neck attach to the skull, hyoid bone, clavicles and the sternum. **They bound the two major neck triangles**; anterior and posterior.

Anterior triangle is defined by the anterior border of the sternocleidomastoid muscle, inferior edge of the mandible and the midline of the neck.

Posterior triangle is bordered by the posterior border of the sternocleidomastoid muscle, anterior border of the trapezius muscle and the superior edge of the middle third of the clavicle.




Hyoid
bone


Cricoid cartilage
Thyroid lobe
Thyroid isthmus
Sternal notch
Trachea

The thyroid cartilage

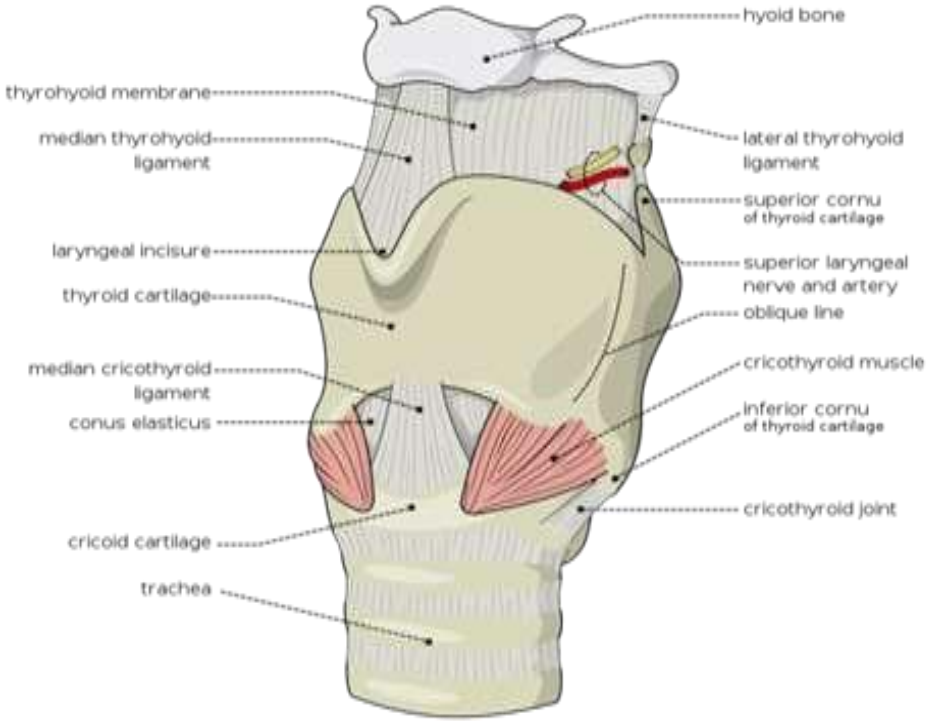
The thyroid cartilage of the larynx forms a bulge in the midline of the neck called the Adam's apple.

The Adam's apple is usually more prominent in men. Inferior to the Adam's apple is the cricoid cartilage.

The trachea extending between the cricoid cartilage and suprasternal notch.

The thyroid cartilage is a hyaline cartilage structure that sits in front of the larynx and above the thyroid gland..

The cricoid cartilage sits just inferior to the thyroid cartilage in the neck, at the level of the C6 vertebra

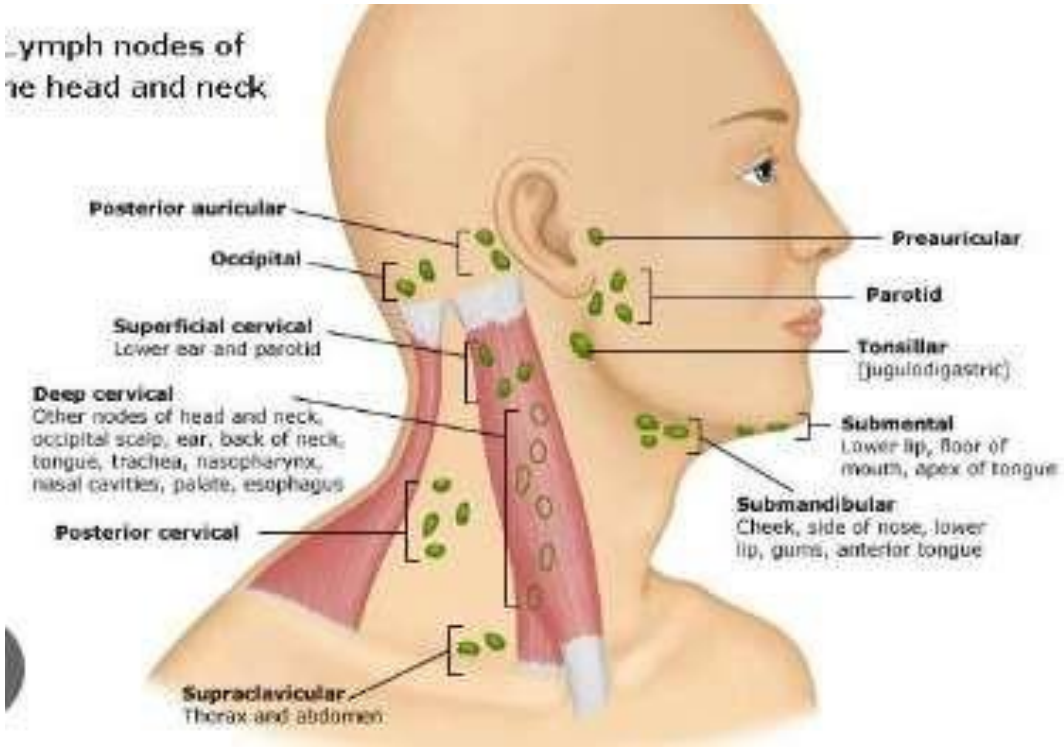


Cervical lymph nodes

Cervical lymph nodes are subject to a number of different pathological conditions including tumours, infection and inflammation

They are distributed and classified into

1. Submental and submandibular nodes
2. Upper jugular nodes
3. Middle jugular nodes
4. Lower jugular nodes
5. Posterior triangle nodes - includes the supraclavicular nodes.
6. Anterior compartment nodes - Pretracheal, paratracheal, precricoid (Delphian) and perithyroid nodes, including those on the recurrent laryngeal nerve.

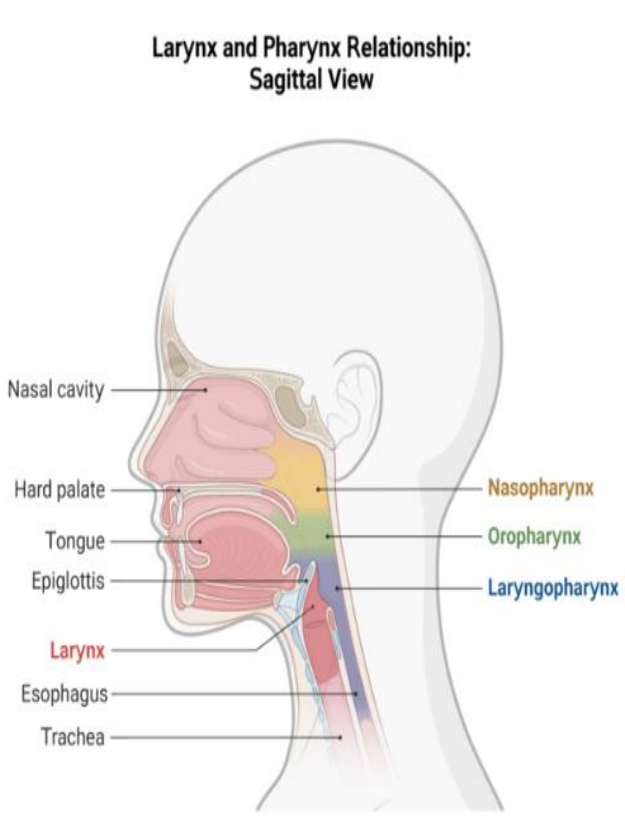


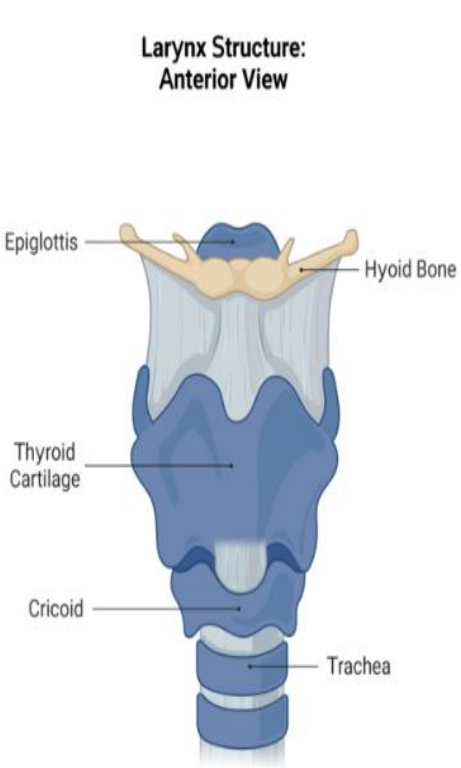
The pharynx

The most distal part of the pharynx, the laryngopharynx is located between the superior border of the epiglottis and inferior border of the cricoid cartilage (C6).

It is continuous inferiorly with the oesophagus.

It is found posterior to the larynx and communicates with it via the laryngeal inlet.





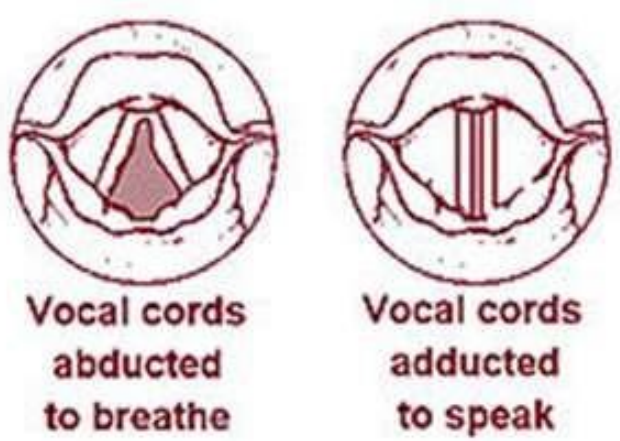
The larynx

commonly called the voice box, it is an organ in the top of the neck involved in breathing, producing sound and protecting the trachea against food aspiration.

The opening of larynx into pharynx known as laryngeal inlet .

The larynx houses the vocal cords, and manipulates pitch and volume, which is essential for phonation.

It is situated just below where the tract of the pharynx splits into the trachea and the esophagus.

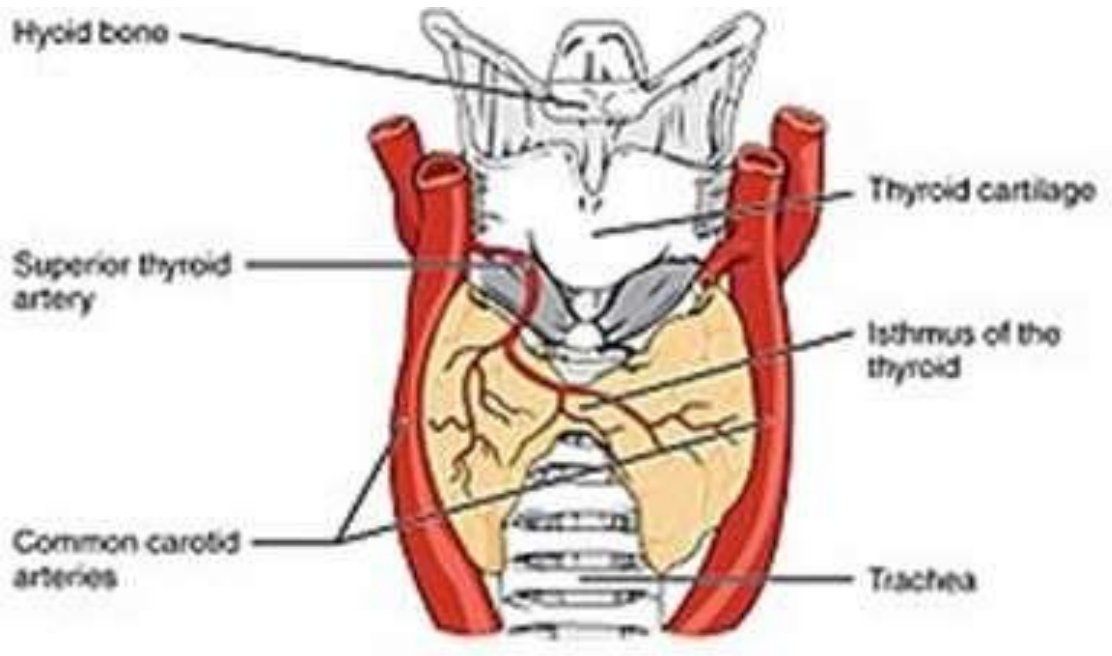


The thyroid gland

is an endocrine gland in vertebrates. In humans it is in the neck and consists of two connected lobes.

The lower two thirds of the lobes are connected by a thin band of tissue called the thyroid isthmus.

The thyroid is located at the front of the neck, below the Adam's apple.



Goitre

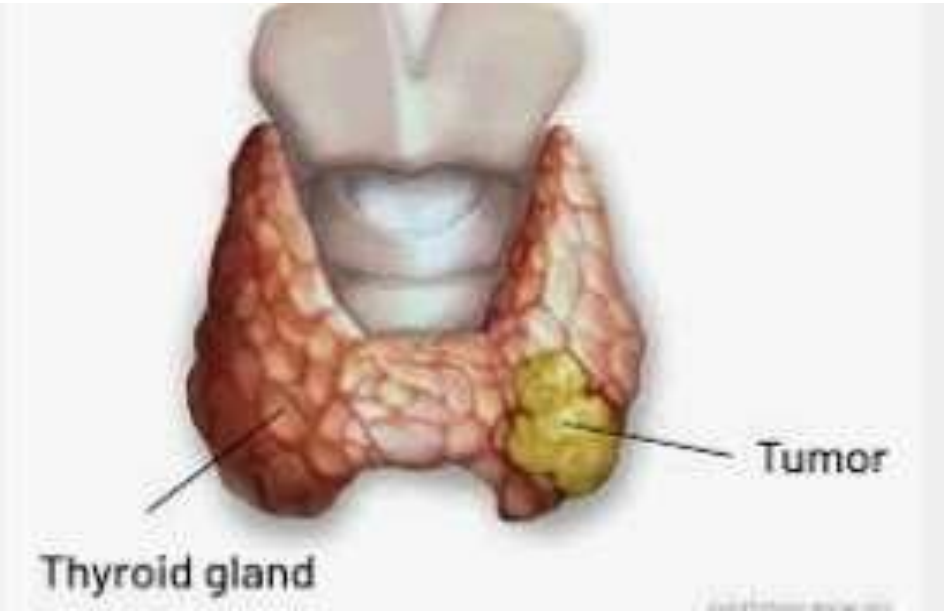
An enlarged thyroid gland is called a goitre. Goitres are present in some form in about 5% of people, and are the result of a large number of causes, including

- 1- iodine deficiency,
- 2- autoimmune disease (both Graves' disease and Hashimoto's thyroiditis),
- 3- infection, inflammation, and
- 4- infiltrative disease such as sarcoidosis and amyloidosis.
- 5- Sometimes no cause can be found, a state called "simple goitre".
- 6- Retrosternal Goiter, Enlarged goitres may extend beyond the normal position of the thyroid gland to below the sternum, around the airway or esophagus.

- Goitres may be associated with hyperthyroidism or hypothyroidism, relating to the underlying cause of the goitre.
- Thyroid function tests may be done to investigate the cause and effects of the goitre.
- The underlying cause of the goitre may be treated, however many goitres with no associated symptoms are simply monitored.
- Thyroid neoplasm

1 Most common a benign adenoma

2Malignant thyroid cancers are most often carcinomas and lymphomas.


Tumor
Thyroid gland

Thyroglossal cyst

- Thyroglossal cysts can be defined as an irregular neck mass or a lump which develops from cells and tissues left over after the formation of the thyroid gland during developmental stages.
- Thyroglossal cysts are the most common cause of midline neck masses and are generally located caudal to (below) the hyoid bone.

Cervical lymphadenopathy

swelling of cervical lymph nodes

it is often used to describe the enlargement of the lymph nodes. Similarly, the term lymphadenitis refers to inflammation of a lymph node .

Cervical lymphadenopathy is a sign or a symptom, not a diagnosis.
causes

1 Infection like viral bacterial .

2 Primary Malignancy like lymphoma, leukemia.

3 Secondary like metastasis.

4- Inflammatory like autoimmune disease. Like Sarcoidosis

Role of imaging in neck masses

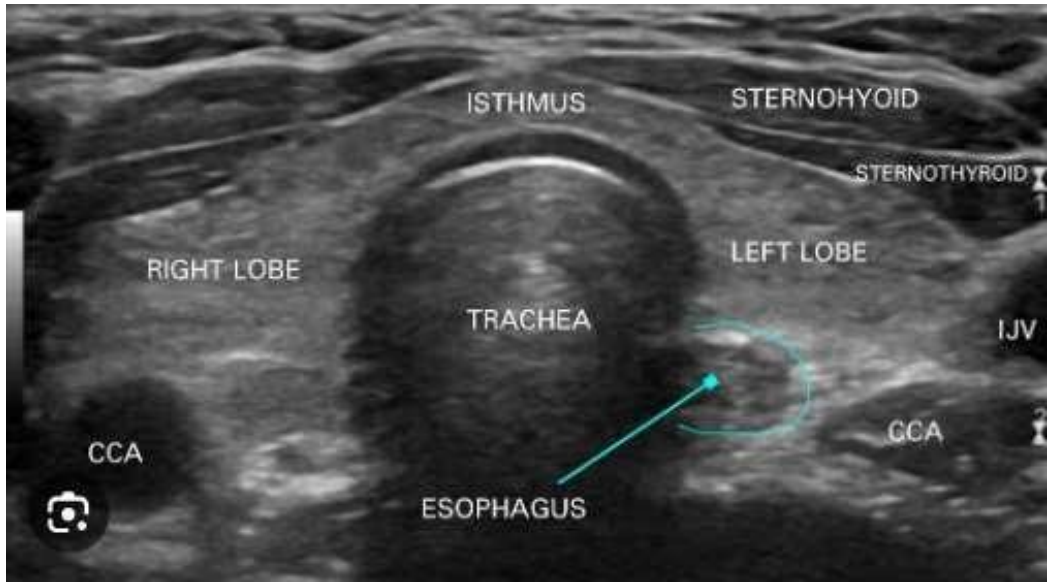
1-Sonography.

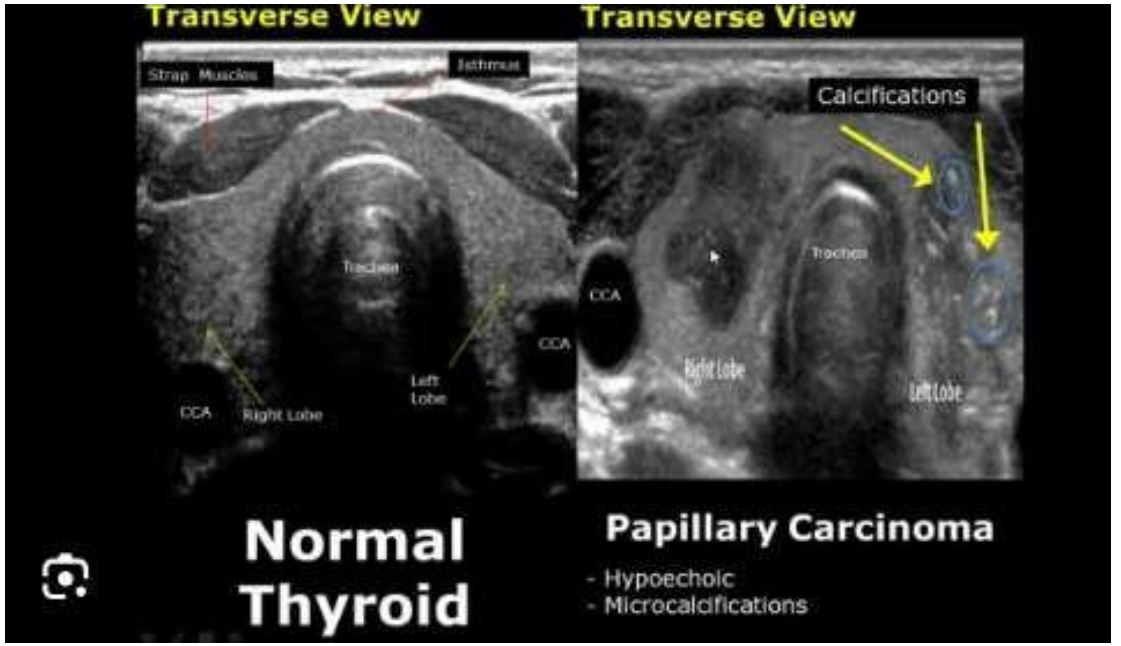
Most structures of the neck, including the thyroid and parathyroid glands, lymph nodes, and salivary glands, are well-visualized by high-frequency ultrasound with exceptional anatomic detail.

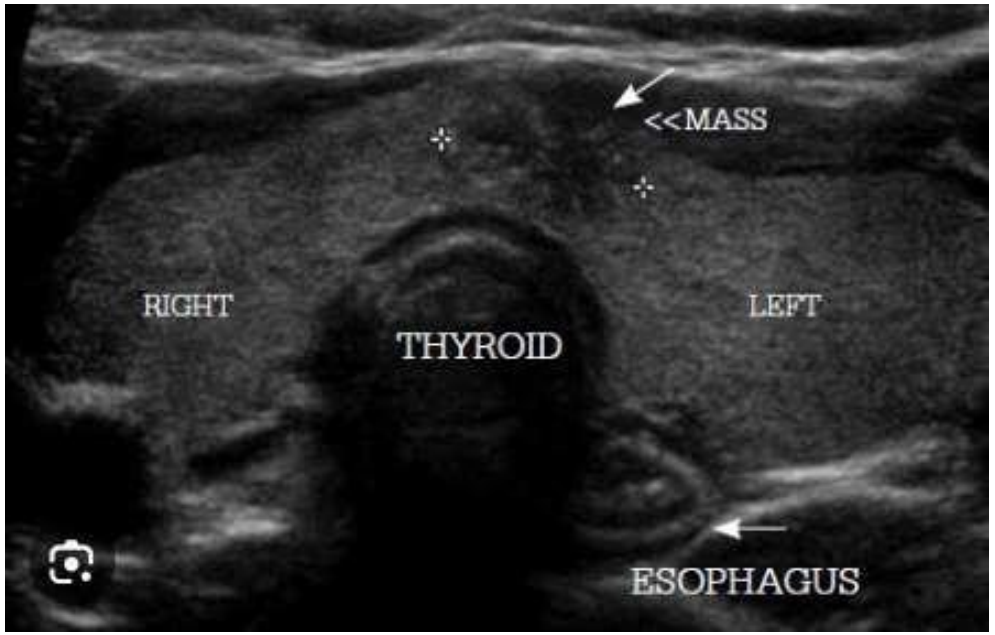
Ultrasound is the preferred imaging modality for thyroid tumors and lesions, and its use is important in the evaluation, preoperative planning, and postoperative surveillance of patients with thyroid cancer.

Thyroglossal duct cyst and brachial cyst are also well imaged by us.

Many other benign and malignant conditions in the head and neck can be differentiated, evaluated, and managed with the help of diagnostic ultrasound and ultrasound-guided procedures.

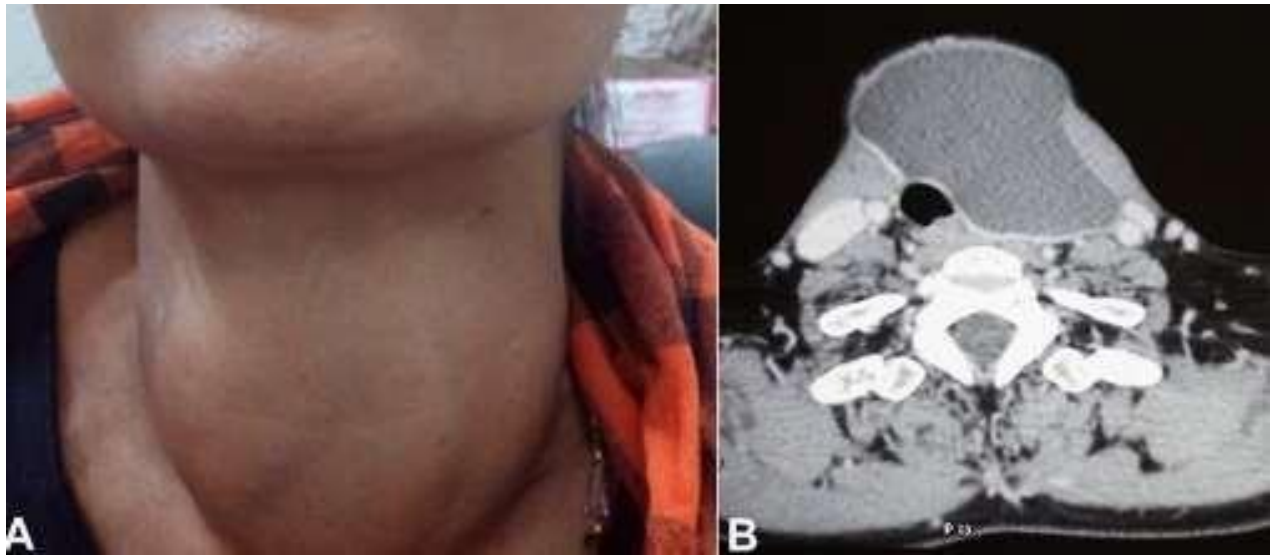

ISTHMUS
STERNOHYOID
STERNOTHYROID
RIGHT LOBE
LEFT LOBE
TRACHEA
IJV
CCA
CCA
ESOPHAGUS

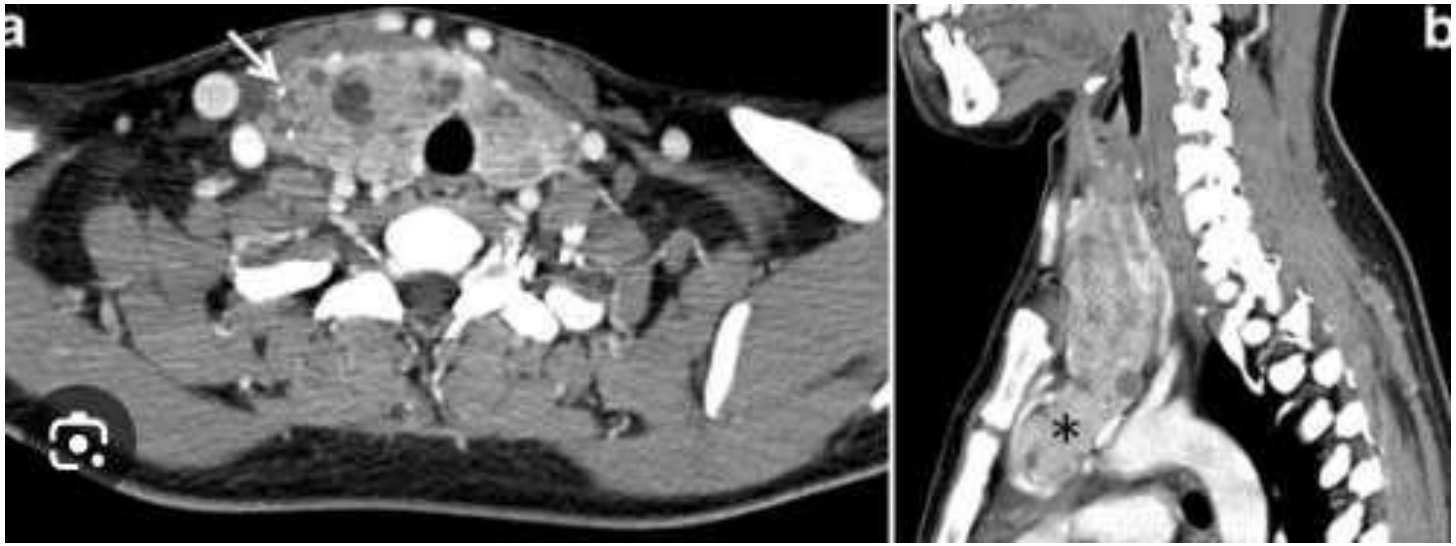

Transverse View
Strap Muscles
Isthmus
Trachea
CCA
Left Lobe
CCA
Right Lobe
Normal Thyroid
Transverse View
Calcifications
Trachea
CCA
CCA
Right Lobe
Left Lobe
Papillary Carcinoma
- Hypoechoic
- Microcalcifications


<<MASS
RIGHT
LEFT
THYROID
ESOPHAGUS

2-Computed Tomography

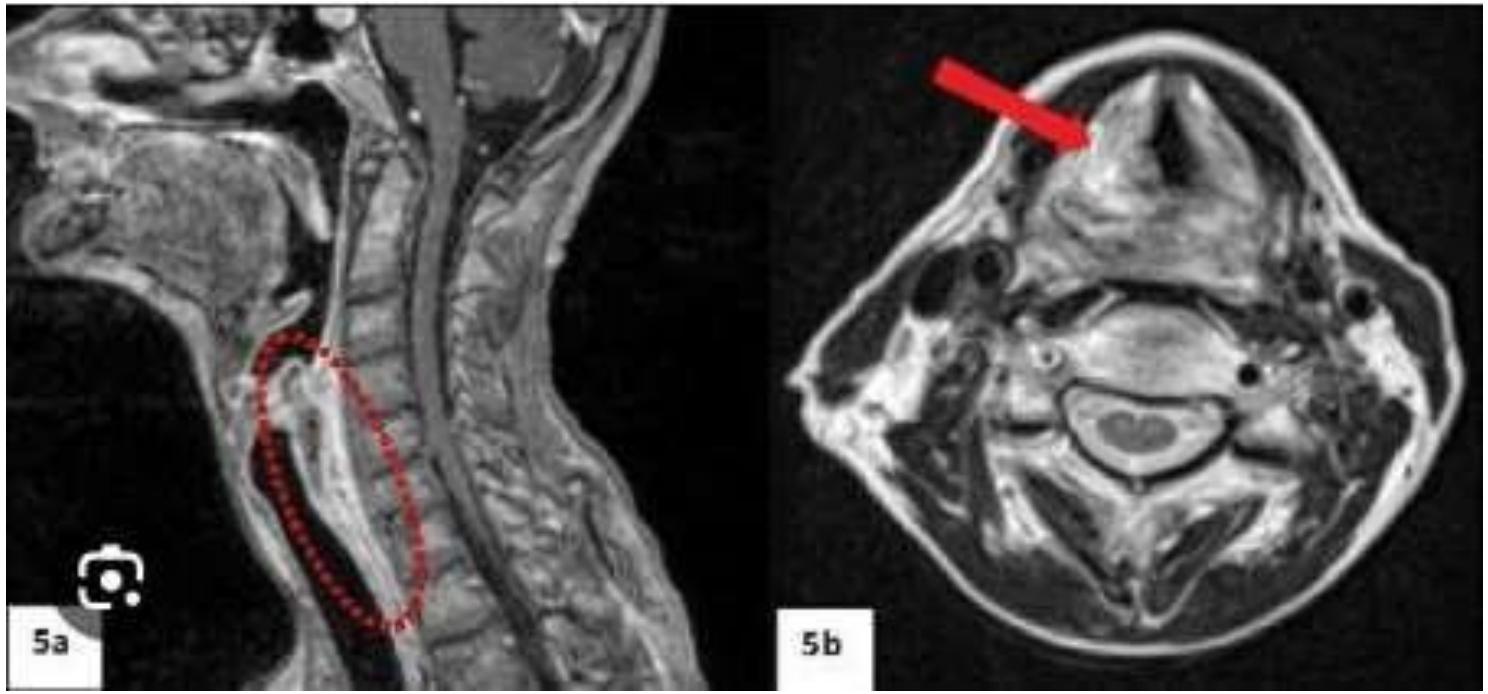
Computed tomography (CT) is often an important diagnostic imaging examination performed in patients in with neck mass suspected as tumors. Mostly with contrast material.





3-MRI

MR imaging has superior soft tissue contrast resolution, which allows excellent characterization of the internal architecture and extent of tumors. A head or neck coil should be used, depending on the location of the mass.



4-FDG-PET

is a useful tool in the imaging of head and neck tumours.

It can be used to stage the primary tumour, to assess response to therapy and most importantly for the detection of recurrent tumour.