

TRACHEA

Pars cervicalis and pars thoracica

Bifurcatio tracheae (T4) - bronchus principalis dexter et sinister

Carina tracheae

The **isthmus glandulae thyroideae** - in contact with the 2nd and 3rd tracheal cartilages
Vv. thyroideae inf. - below the isthmus.

The sides of the trachea - **lobes of the thyroid gland**.

Paratracheal space - A. carotis com., v. jugularis int. and n. vagus run

Oesophagus – posteriorly

N. laryngeus recurrens - in the groove between the trachea and oesophagus.

Nodi lymphatici tracheobronchiales

15 – 20 hyaline cartilages (**cartilagineae tracheales**) connected by **ligg. anularia**

paries membranaceus

glandulae tracheales

Tracheotomy

The incision is commonly made through the second and third tracheal rings. As the isthmus of the thyroid gland covers the 2nd and 3rd tracheal rings, it is retracted inferiorly (**tracheotomia superior**) or incision is performed through lower tracheal rings (**tracheotomia inferior**).

During the inferior tracheotomy, the following anatomical facts must be kept in mind to avoid possible damage to important structures: 1) the **inferior thyroid veins** form a plexus anterior to the trachea; 2) a small **a. thyroidea ima** is present in about 10% of people and ascends to the inferior border of the isthmus; 3) the left **brachiocephalic vein, jugular venous arch**, and the **pleurae** may be encountered, particularly in children; 4) the **thymus** covers the inferior part of the trachea in infants.

Tracheostomy, when the duration of endotracheal intubation is expected to be longer than 72 hours.

THYROID GLAND

Lobus, dexter, sinister, isthmus (lobus pyramidalis)

Capsula propria

Fascia externa s. perithyroidea

Folliculi - colloid - thyroglobulin (thyroxin, trijodthyronin)

PARATHYROID GLANDS (GLANDULAE PARATHYROIDEAE)

2 pairs of small lens-shaped glands may be inserted in the capsule or parenchyma of the thyroid gland. The cranial pair - at the level of the lower margin of the cricoid cartilage; the caudal pair lies at the lower margin of the thyroid gland lobes.

parathormone - regulates plasmatic levels of calcium and phosphorus.

BRONCHI

Arbor bronchialis

Bronchi principales dexter et sinister (bifurcatio tracheae) - bronchi lobares (3 right and 2 left) - **bronchi segmentales**

LUNG (PULMO)

Basis pulmonis

Apex pulmonis - sulcus arteriae subclaviae and the **sulcus costae primae**

Facies diaphragmatica

Facies costalis

Facies mediastinalis - hilum pulmonis - radix pulmonis. The craniocaudal order of the root structure is different on the right (bronchus, pulmonary artery and veins) than on the left (artery, bronchus, veins).

The mediastinal surface of the right lung– **sulcus v. cavae sup., sulcus v. azygos, sulcus oesophageus, impressio cardiaca.**

The mediastinal surface of the left lung - **sulcus aorticus, impressio cardiaca, sulcus oesophageus**

Margo inferior, anterior, posterior

Incisura cardiaca - lingula pulmonis sinistri

Fissurae interlobares - fissura obliqua, fissura horizontalis - lobus medius

BRONCHOPULMONARY SEGMENTS (segmenta bronchopulmonalia)

The right lung: segmentum apicale 1, posterius 2, anterius 3 in the superior lobe, segmentum laterale 4 and mediale 5 in the medial lobe, and segmentum apicale 6, basale mediale 7, basale anterius 8, basale laterale 9, basale posterius 10.

The left lung: segmentum apicoposterius 1+2, segmentum anterius 3, segmentum lingulare superius 4 and segmentum lingulare inferius 5 in the superior lobe. Segmentum apicale 6, segmentum basale mediale 7 that is variable and often merges with the next segmentum basale anterius 8, basale laterale 9, basale posterius 10.

Segmentectomy – lobectomy - pneumonectomy

Bronchioli have no cartilages - **terminal bronchioli - 2-3 bronchioli respiratorii - ductuli alveolares** terminated by **atria - sacculi alveolares - alveoli**

The whole number of alveoli is 300-400 milion and their surface is 50-80 m².

PLEURA

Pleura visceralis - pleura costalis, pleura diaphragmatica, pleura mediastinalis

Pleura parietalis

Lig. pulmonale

Cavum pleurae

Cupula pleurae

Lig. scalenopleurale, vertebropleurale, costopleurale

Recessus pleurae

Recessus costodiaphragmaticus - deepest - The caudal margin of the lung is inserted in it during inspiration but it does not fill the recess entirely even during the maximal inspiration.

Recessus costomediastinalis

Recessus phrenicomediastinalis

Pneumothorax

Borders of the parietal pleura

Cupula pleurae projects to the fossa supraclavicularis minor (between both attachments of the sternocleidomastoideus muscle). The ventral border descends from the cupula medially behind the sternum to the level of the 2nd rib. This triangle demarcates the space for the

thymus (**area interpleuralis sup. s. thymica**). The ventral border then continues from the 2nd to the 4th rib (parallel to the opposite ventral border) shifted slightly to the left. The right ventral border then descends to the 6th sternocostal joint while on the left a convex arch forms the triangular space for the pericardium (**area interpleuralis inferior s. pericardiaca**) and ends at the 6th costal cartilage. The caudal border is the same on both sides: from the 6th rib descends obliquely laterally, in the midclavicular line reaches below the 7th rib, in the anterior axillary line reaches the lower margin of the 8th rib, in the middle axillary line the lower margin of the 9th rib and in the posterior axillary line the lower margin of the 10th rib. In the scapular line the lower border reaches the 11th rib and in the paravertebral line it reaches the 12th costovertebral joint. At the left side it may reach more caudally (the left dome of the diaphragm is lower).

Borders of the lungs

Apex pulmonis fills the cupula pleurae, it has the same border. The ventral border of both lungs corresponds to the ventral border of the pleura. The lower border projects 1-2 ribs higher than the lower border of the pleura. In the paravertebral line it reaches the 11th rib. The posterior border projects lateral to the vertebrae from T11 to C7.

Mechanics of the respiration

The respiration is caused by the volume changes of the lungs induced by movements of the thorax by means of respiratory muscles. Throughout this process the volume of the thorax becomes smaller during expiration and enlarges during inspiration. The diaphragm may be regarded as a piston that during its contraction makes excursions down to enlarge the thorax in craniocaudal direction. The external intercostal muscles enlarge the thorax in the ventrodorsal and transverse direction. The lungs expand due to a decline of pressure in the pleural cavity and adhesion between the visceral and parietal pleurae maintaining by pleural fluid and increase their volume. Air is sucked into the respiratory tract. During expiration the elastic thoracic cage returns to its resting position. The abdominal muscles contract, push to the internal organs and relaxed diaphragm that is pushed upward. Contraction of the internal and intimal intercostals muscles results in the diminution of the ventrodorsal and transverse diameter of the thorax and air is expired. The own elasticity of the lungs also participates in expiration.

pericardiophrenicae and n. phrenicus. The posterior mediastinum contains the oesophagus with the vagal trunks, which lie ventrally and dorsally, descending aorta, thoracic duct, azygos and hemiazygos veins, and sympathetic trunks.

THYMUS

Lobus dexter et sinister

Capsula thymi

Lobuli thymi

Cortex, medulla thymi