

Name = Saman nadeem

ID = 16766

Paper = Human Anatomy - 1

Discipline = BS (RAD)

Q1: Explain the mechanism of breathing:

The air which we breathe in and out of the lungs varies in its pressure. So basically when there is a fall in air pressure the alveolar spaces fall and the air enters the lungs (inspiration) and as the pressure of the alveoli within exceeds the atmospheric pressure, the air is blown from the lungs (expiration).

The flow rate of air is in proportion to the magnitude of the pressure difference.

The breathing mechanism involves two processes.

* Inspiration

* Expiration

Inspiration:

Quiet inspiration: Compare the thoracic cavity to a box with a single entrance at the top, which is a tube called the trachea.

The capacity of the box can be increased by elongating all its diameters, and this results in air under atmospheric pressure entering the box through the tube.

vertical Diameter

Theoretically, the roof could be raised and the floor lowered.

The maximum vertical diameter of the lung is defined as the craniocaudal distance from the apex to the bottom of the lungs.

When the diaphragm contracts, the domes become flattened and the level of the diaphragm is lowered.

Anteroposterior Diameter

Distance from the front to the back of the chest Anterior-posterior diameter.

If downward-sloping ribs were raised at their sternal ends, the anteroposterior diameter of the thoracic cavity would be increased and the lower end of the sternum would be thrust forward.

This can be brought about by fixing the 1st rib by the contraction of the scaleni muscles of the neck and contracting the intercostal muscle.

By this means, all the ribs are drawn together and raised toward the first ribs.

Transverse Diameter

Size of the chest from side (transverse diameter)

The ribs articulate in front with the sternum via their costal cartilages and behind with the vertebral column.

Because the ribs curve downward as well as forward around the chest wall, they resemble bucket handles.

It therefore follows that if the ribs are raised (like bucket handles), the transverse diameter of the thoracic cavity will be increased. As described previously, this can be accomplished by fixing the 1st rib and raising the other ribs to it by contracting the intercostal muscles.

Expiration

Quiet Expiration

Expiration is largely a passive phenomenon and is brought about by the elastic recoil of the lungs, the relaxation of the intercostal muscle and diaphragm, and an increase in tone of the muscle of the anterior abdominal wall, which forces the relaxing diaphragm upward.

The serratus posterior inferior muscles play a minor role in pulling down the lower ribs.

Q2:- What do you know about the origin of diaphragm?

A- The diaphragm is a sheet of internal skeletal muscle in humans and other mammals that extends across the bottom of the thoracic cavity. The diaphragm separates the thoracic cavity containing the heart and lungs, from the abdominal cavity and performs an important function in respiration. As the diaphragm contracts, the volume of the thoracic cavity increases, creating a negative pressure there, which

Origin:- Septum transversum pleuroperitoneal folds body wall

Artery:- pericardiophrenic artery, musculophrenic artery, inferior phrenic arteries.

Vein:- Superior phrenic vein, inferior phrenic vein

Nerve:- phrenic and lower intercostal nerves.

Origin

A **sternal part:-** Arise from the posterior surface of the xiphoid process

B **Costal part:-** Arise from the deep surfaces of the lower six ribs and their costal cartilages & forms the right & left domes.

vertebral (lumber part):- arise from upper three lumber vertebrae. Form the right & left crura & the arcuate ligaments.

Q3:- Classify the ribs according to their attachment to the sternum?

A:- The ribs are classified into three groups based on their attachment to the sternum.

The sternum consists of the manubrium body, and xiphoid process. The ribs are classified as true ribs (1-7) and false ribs (8-12). The last two pairs of false ribs are also known as floating ribs.

Q4:- What do you know about the general feature of first rib?

A:- The first rib is the most curved and usually the shortest of all the ribs: it is broad and flat, its surface looking upward and downward, and its borders inward and outward.

The head is small, rounded, and possesses only a single articular facet, for articulation with the body of the first thoracic vertebra.

The neck is narrow and rounded. The tubercle, thick and prominent, is placed on the outer border. There is no angle, but at the tubercle the rib is slightly bent, with the convexity upward - so that the head of the bone is directed downward. The upper surface of the body is marked by two shallow grooves separated from each other by a slight ridge prolonged internally into a tubercle the scalene tubercle, for the attachment of the scalenus anterior the anterior groove transmits the subclavian vein, the posterior the subclavian artery and the lowest trunk of the brachial plexus. Behind the posterior groove is a rough area for the attachment of the scalenus medius. The under surface is smooth and destitute of a costal groove. The outer border is convex thick, and rounded, and at its posterior part gives attachment to the first digitation of the serratus anterior: the inner border is concave, thin and sharp, and marked about its center by the scalene tubercle. The anterior extremity is larger and thicker than that of any of other ribs.

Q:- How is the mediastinum divided?

A:- The mediastinum is divided into two parts

by an imaginary line that runs from the sternal angle (the angle formed by the junction of the sternal body and manubrium) to the T₄ vertebrae.

- Superior mediastinum: extends upwards terminating at the superior thoracic aperture
- Inferior mediastinum: extends downwards terminating at the diaphragm. it is further subdivided into the anterior mediastinum.

Q:- Briefly discuss the structure of lungs?

A:- The lungs are a pair of spongy, air filled organs located on either side of the chest (thorax). The trachea (windpipe) conducts inhaled air into the lungs through its tubular branches, called bronchi. The bronchi then divide into smaller branches finally becoming microscopic.

The bronchioles eventually end in clusters of microscopic air sacs called alveoli. In the alveoli, oxygen from the air is absorbed into the blood. Carbon dioxide, a waste product of metabolism, travels from the blood to the alveoli, where it can be exhaled.

Between the alveoli, where it can be is a thin layer of cells called the interstitium, which contains blood vessels and cells that help support the alveoli.

The lungs are covered by a thin tissue layer called pleura. The same kind of thin tissue line the inside of the chest cavity also called pleura. A thin layer of fluid acts as a lubricant allowing the lungs to slip smoothly as they expand and contract with each breath.

The End