

COSTOVERTEBRAL JOINTS

Joints of the heads of the ribs

Head of a typical rib articulates with the upper border of the corresponding vertebral body and the inferior border of the vertebral body above; i.e., levels with the intervertebral disc. The synovial joint thus formed is strengthened by the radiate ligament that connects the front of the head of rib with the adjacent vertebral border and intervertebral disc.

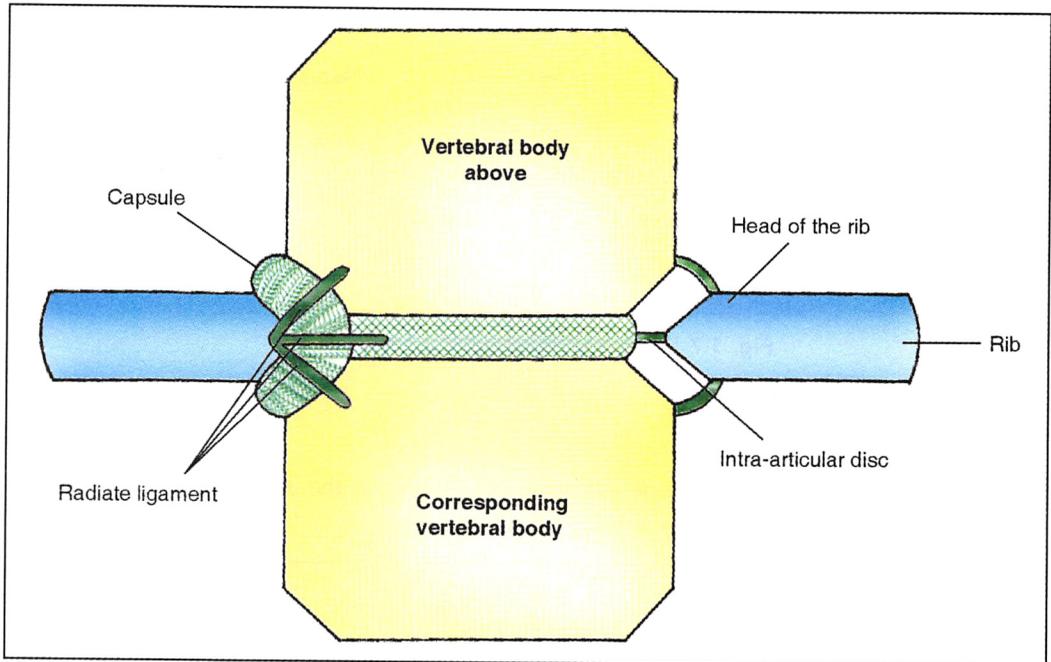


Fig. 1.9 Joints of heads of ribs

The cavity of the joint is divided into upper and lower compartments by an intra-articular ligament which connects the crest of the head with the intervertebral disc.

Costovertebral joint

It is a synovial joint formed between the articular facet of the tubercle of rib and costal facet on the front of the lateral part of transverse process of the corresponding vertebra. The joint is strengthened by three costovertebral ligaments.

The inferior costovertebral ligament connects the front of the corresponding transverse process medial to the joint. A similar ligament lateral to the joint is called lateral costovertebral ligament. The superior costovertebral ligament connects the superior border of neck of rib with the transverse process of the vertebra above.

Respiratory Movements

These are the movements of the ribs and diaphragm which are responsible for the act of respiration. Former is responsible for increase in the anteroposterior and transverse diameters while the latter causes increment of the vertical diameter during inspiration. All diameters are reduced during expiration.

Thoracic respiration involves movements of the thoracic cage. Movements of diaphragm, as during quiet respiration results into 'abdominal respiration'. Normally, the anterior abdominal wall moves forwards and backwards during inspiration (depression of diaphragm) and expiration (elevation of diaphragm) respectively.

Since the anterior ends of ribs are lying at a lower level than the posterior ones, their elevation also moves them forward, an action responsible for increase in the anteroposterior diameter during inspiration. Such movements elevate the sternum with angulation of 7° at the manubriosternal joint. This phenomenon is also called 'pump handle movement'.

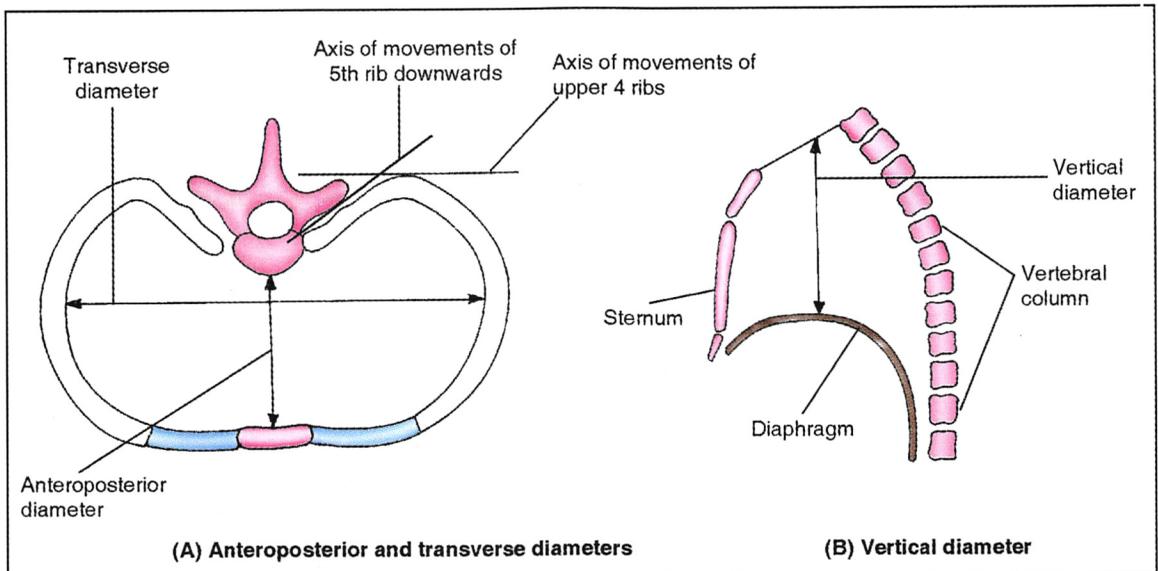


Fig. 3.1 Diameters of the thorax

Intercostal Vessels

INTERCOSTAL ARTERIES

Posterior intercostal arteries

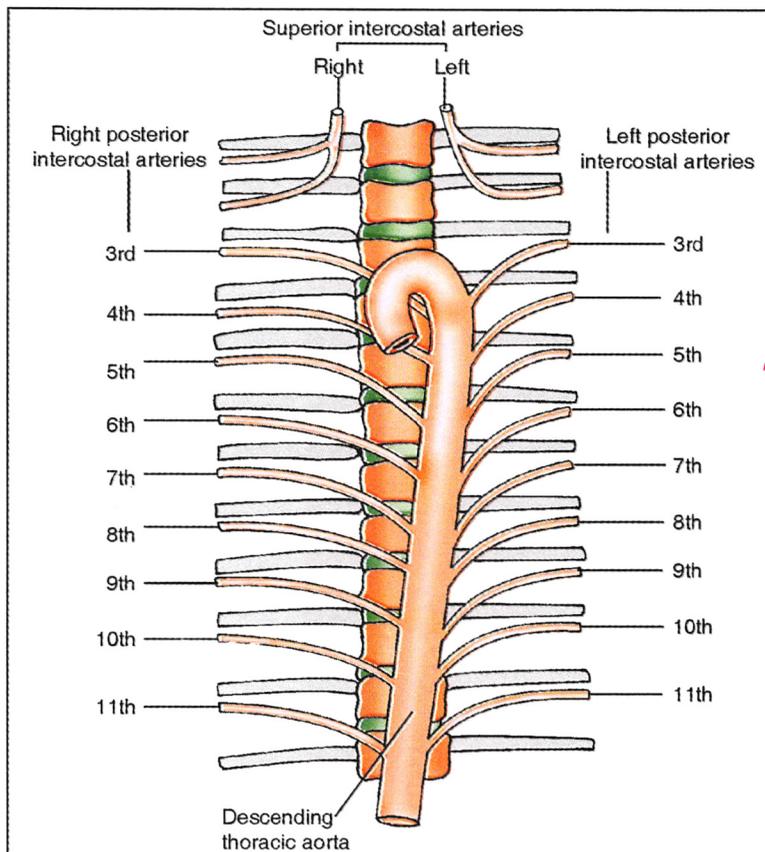


Fig. 6.1 Posterior intercostal arteries

Right and Left Mediastinal Views

Features of Right and Left Surfaces of The Mediastinum

Right and left mediastinal views are mirror images of the impressions on the medial surfaces of right and left lungs respectively. Some of the relations are very specific for right and left views. These are as follows:

RIGHT MEDIASTINAL VIEW

1. Right atrium
2. Inferior vena cava
3. Superior vena cava
4. Right brachiocephalic vein

Upper four structures occupy the anterior part of the mediastinal view just behind the sternum.

5. Azygos vein – It is a vertical vein over the vertebral bodies behind the heart. Reaching the level of sternal angle it arches forwards above the root of right lung to enter the superior vena cava.
6. Trachea – It lies in the upper part of the mediastinum in a plane posterior to the superior vena cava and right brachiocephalic vein.

LEFT MEDIASTINAL VIEW

1. Left ventricle – It lies in the anterior part of this view just behind the sternum.
2. Arch of aorta – It arches over the root of the left lung.
3. Descending thoracic aorta - It is continuation of arch of aorta and lies just behind the heart.
4. Left common carotid artery.
5. Left subclavian artery.

Above two arteries ascend from arch of aorta of which the former is more anterior.

6. Thoracic duct – It is a vertical lymphatic duct lying in the upper part of this view in a more posterior plane, even behind the subclavian artery.