Gross Anatomy of the PERICARDIUM and HEART

M1 Gross and Developmental Anatomy
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Opened Chambers of the Human Heart

Mediastinum

Subdivisions of the Mediastinum
(Mid-sagittal plane drawing from Textbook of Anatomy by W. Henry Hollinshead)

II. Pericardial sac

Fibrous pericardium (inferiorly fuses to central region of diaphragm)

Phrenic nerve: from cervical spinal nerves (C3-C5)

Pericardiacophrenic artery and vein
Note the opened Pericardial Sac

The pericardial sac is the space between the parietal and visceral layers of the serous pericardium. The sac normally contains only a thin layer of serous fluid, but inflammation of the sac (pericarditis) can cause a large increase in the volume of fluid.

The visceral layer of pericardium (or epicardium) tightly adheres to the surface of the heart.

The fibrous layer of pericardium is thick and makes the pericardial sac tough and inflexible.

Note the opened Pericardial Sac

Grant’s Atlas, 12th Ed., p. 25

Diagrammatic Coronal Section

Grant’s Atlas, 11th Ed., Fig. 1.57B, p. 63

Superior View of Diaphragm

The fibrous pericardium is fused to the superior surface of the diaphragm. Thus, the heart moves up and down with the diaphragm during respiration.

Pericardial sac

Inferior vena cava

Esophagus

Aorta

Grant’s Atlas, 12th Ed., Fig. 1.70A, p. 73

Layers of the Heart Wall (page 266)

Fibrous pericardium:
(inferiorly fuses to central region of diaphragm)

Epicardium:
Visceral pericardium
Fat and blood vessels

Myocardium:
heart muscle

Endocardium:
innermost endothelial layer)

II. Pericardial Sinuses (page 266)

Transverse pericardial sinus:
Between pericardial attachments to pulmonary veins and SVC and the aorta and pulmonary trunk

Oblique pericardial sinus
Oblique and Transverse Pericardial Sinuses

The base of the heart sits here, forming the opposite (anterior) wall of the oblique pericardial sinus. The line of junction between the parietal and visceral layers of serous pericardium surrounds the six great veins and creates a cul-de-sac known as the oblique pericardial sinus.

The Esophagus and Thoracic Aorta lie behind the Oblique Pericardial Sinus

AA = Ascending aorta
AR = Aortic arch
DA = Descending aorta
BT = Brachiocephalic trunk
RS = Right subclavian a.
RC = Right common carotid a.
LC = Left common carotid a.
LS = Left subclavian a.

Grant’s Atlas, 12th Ed., Fig. 1.44B, p. 51
III. External form of the Heart

- Anterior view
- Posterior view

- Coronary (or atrioventricular) sulcus
- Anterior interventricular sulcus
- Posterior interventricular sulcus
- Sternocostal surface
- Diaphragmatic surface

IV. Blood Supply of the Heart

- Right coronary a.
  - SA nodal branch
  - Conus
  - Right marginal
  - AV nodal branch
  - Posterior interventricular

- Left coronary a.
  - Anterior interventricular
  - Diagonal branches
  - Circumflex
  - Posterior ventricular
  - Left marginal

Coronary Arteries

- SA nodal branch
- Left coronary artery (main stem)
- Circumflex branch
- Left anterior descending branch (LAD)
- Left marginal branch
- Conus branch
- Right marginal branch

Note: LAD is also called the anterior interventricular branch

Coronary Arteries and Cardiac Veins

- Sinuatrial nodal a.
- Left coronary a.
- Circumflex a.
- Marginal a.
- Anterior Interventricular a.
- Right Coronary a.
- Right marginal a.
Anomalous Origins of Coronary Arteries

Single coronary artery  
(bad news if it becomes blocked)

Circumflex artery  
arising from right coronary sinus

LIMA Graft Provides an Artery to Artery  
Bypass around a Blocked LAD  
The left internal mammary artery (LIMA) lies very close (just outside the pericardial sac) to the left anterior descending artery (LAD). It can be diverted and anastomosed to the LAD to bypass a blockage in this important arterial supply to the left ventricle and interventricular septum.

Cardiac veins

Great cardiac  
Middle cardiac  
Small cardiac  
Anterior cardiac  
Least cardiac  

Grant’s Atlas, 12th Ed., Fig. 1.46A, p. 53
Cardiac veins

Grant's Atlas, 12th Ed., Fig. 1.46D, p. 53

Opened Chambers of the Human Heart

Right Atrium Opened

Grant's Atlas, 12th Ed., Figs. 1.49 A&B, p. 56

Right Ventricle Opened

Grant's Atlas, 12th Ed., Figs. 1.50 A, p. 57

Left Atrium and Ventricle
Sectioned with Mitral Valve Cut Away

Grant’s Atlas, 12th Ed., Figs. 1.50 A, p. 57
Grant’s Atlas,
12th Ed., 37
Figs. 1.52A, p. 59

Grant’s Atlas,
12th Ed., 39
Figs. 1.53 & 1.54C, p. 60

Cardiac Conduction System

This diagram shows the cardiac nerves and the locations of the superficial (a) and deep (b) cardiac plexuses. Vagal branches are shown as dashed lines and sympathetic branches are shown as dotted lines. The thoracic cardiac nerves from the upper thoracic sympathetic trunks are not shown. (From Textbook of Anatomy by W. Henry Hollinshead)
Actual locations of the 4 heart valves projected onto the anterior thoracic wall. The actual locations do not correspond to the sites of auscultation. The sites of auscultation are where the chamber distal (in terms of blood flow) to the valve lies closest to the body surface.
P=Pulmonary valve, A=Aortic valve, M=Mitral valve, and T=Tricuspid valve. (From Textbook of Anatomy by W. Henry Hollinshead)