HEART & PERICARDIUM-1

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PERICARDIUM

COMPETENCIES -AN22.1-Describe & demonstrate subdivisions, sinuses in pericardium, blood supply and nerve supply of pericardium

Specific Learning Objectives
1. Define pericardium
2. Enumerate subdivisions of pericardium
3. Describe sinuses of pericardium
4. Describe blood and nerve supply of pericardium
5. Applied anatomy
PERICARDIUM

The pericardium is a fibroserous sac that encloses the heart and the roots of the great vessels.

Its function is to restrict excessive movements of the heart as a whole and to serve as a lubricated container in which the different parts of the heart can contract.

The pericardium lies within the middle mediastinum, posterior to the body of the sternum and the 2nd to the 6th costal cartilages and anterior to the 5th to the 8th thoracic vertebrae.
SUBDIVISIONS OF PERICARDIUM

- Pericardium
  - Fibrous pericardium
  - Serous pericardium
  - Parietal pericardium
  - Visceral pericardium

- Pericardial fluid

- Pericardium

- Great vessel
  - Fibrous pericardium
  - Parietal pericardium
  - Epicardium
  - Heart

- Diaphragm
The fibrous pericardium is the strong fibrous part of the sac.

It is firmly attached below to the central tendon of the diaphragm.

It fuses with the outer coats of the great blood vessels passing through it — namely, the aorta, the pulmonary trunk, the superior and inferior venae cavae, and the pulmonary veins.
The fibrous pericardium is attached in front to the sternum by the sternopericardial ligaments.
Serous pericardium

Serous Pericardium lines the fibrous pericardium and coats the heart. It is divided into parietal and visceral layers.

The **parietal layer** lines the fibrous pericardium and is reflected around the roots of the great vessels to become continuous with the visceral layer of serous pericardium that closely covers the heart.

The **visceral layer** is closely applied to the heart and is often called the epicardium.

The slitlike space between the parietal and visceral layers is referred to as the **pericardial cavity**.

Normally, the cavity contains a small amount of tissue fluid (about 50 mL), the **pericardial fluid**, which acts as a lubricant to facilitate movements of the heart.
Sinuses of pericardium

- Transverse sinus
- Oblique sinus

Reflections of visceral layer of peritoneum around great vessels of the heart
Sinuses of pericardium

**Transverse Sinus**

- Horizontal gap between the arterial ends of heart tubes in front and venous ends behind
- Ant: Ascending aorta, Pulmonary trunk
- Post: SVC
- On each side it opens into Pericardial cavity
Sinuses of pericardium

Transverse Sinus

- Superior vena cava
- Ascending aorta
- Index finger passing through transverse sinus
- Pulmonary trunk
Sinuses of pericardium

**Oblique Sinus:**

- Formed by reflections of pericardium onto pulm veins of heart
- **Cul-de-sac/cardiac bursa**
- **Ant:** by the Lt Atrium
- **Post:** Parietal pericardium
- Below it opens into the Pericardial cavity
Blood supply of the pericardium

- The pericardium is supplied by branches from the:
  1. internal thoracic,
  2. pericardiacoephrenic
  3. Musculophrenic artery
  4. inferior phrenic arteries
  5. the thoracic aorta.

- Veins from the pericardium enter
  - the azygos system of veins
  - internal thoracic veins
  - superior phrenic veins.
Nerve supply

Fibrous and visceral pericardium - Phrenic nerve
PAIN SENSITIVE

Visceral pericardium - Branches of sympathetic trunk and vagus via cardiac plexus
PAIN INSENSITIVE
Applied anatomy- PERICARDITIS

- Inflammation of the pericardium (pericarditis) usually causes chest pain.
- The pain is sharp in quality and increases with inspiration. It radiates to the trapezius ridge and is partially relieved by sitting up.
- Pericarditis may also make the serous pericardium rough. Usually the smooth opposing layers of serous pericardium make no detectable sound during auscultation, but in pericarditis friction of the roughened surfaces sounds like the rustle of silk when listening with a stethoscope over the left sternal border and upper ribs (**pericardial friction rub**).
- Heart sounds are understandably distant or muffled.
- A chronically inflamed and thickened pericardium may actually calcify, seriously hampering cardiac efficiency.
Some inflammatory diseases produce pericardial effusion (passage of fluid from pericardial capillaries into the pericardial cavity, or an accumulation of pus). As a result, the heart becomes compressed (unable to expand and fill fully) and ineffective. Non-inflammatory pericardial effusions often occur with congestive heart failure.
The fibrous pericardium is a tough, inelastic, closed sac that contains the heart + thin lubricating layer of pericardial fluid

If extensive pericardial effusion exists, the compromised volume of the sac does not allow full expansion of the heart, limiting the amount of blood the heart can receive, which in turn reduces cardiac output.

This phenomenon, cardiac tamponade (a.k.a. heart compression), is a potentially lethal condition because heart volume is increasingly compromised!!!
Applied anatomy- PERICARDIOCENTESIS

- Drainage of fluid from the pericardial cavity, **pericardiocentesis**, is usually necessary to relieve cardiac tamponade.
- **To remove the excess fluid, a wide-bore needle may be inserted through the left 5th or 6th intercostal space near the sternum.**
- This approach to the pericardial sac is possible because the cardiac notch in the left lung and the shallower notch in the left pleural sac leaves part of the pericardial sac exposed ‘the bare area’ of the pericardium.
• The pericardial sac may also be reached by entering the infrasternal angle and passing the needle superoposteriorly.
• The needle avoids the lung and pleurae and enters the pericardial cavity; however, care must be taken not to puncture the internal thoracic artery.
LABEL THE DIAGRAM

Identify the indicated components of the pericardium.
Identify the indicated pericardial sinuses and associated structures.