

THROMBOSIS

Thrombosis is the formation within the vascular lumen of a thrombus, **an aggregate of coagulated blood containing platelets, fibrin, and entrapped cells.**

Thrombosis is a pathological process

Pathogenesis

It develops from three main ways.

- 1. Slowing blood flow**
- 2. Coagulopathie**
- 3. Injury of vein Wall / endothelial.**

Major predispositions to thrombosis

Types of Trombose

I. ACCORDING TO PATHOGENESIS

1. Coagulation Trombose

The slowing of blood flow is shaped by an increase in coagulation tendency.

The consequence of this is that the vein wall is also affected later (eg in relation to hypoxia). But the main reason is the slowing of blood and coagulation disorder

2. Conglutination thrombose (Thrombosis associated with vascular disease)

It occurs when the vein is injured by endothelial cells. It is more common in the arteries.

3. Mix Trombose

This type of vein wall disorder starts as consequent, conglutination thrombosis. Coagulation then continues in the form of thrombosis, completely covering the dasmar lumen.



Hyalini trombose: It is treated as a type of thrombosis, it is actually a result of thrombosis and the thrombosis is formed by hyalinization.



Morphological Differences of Coagulation and Conglutination Trombose

Coagulation Trombose

- Clot in the lumen of vessel, filled lumen.
- No adhesion on the vessel wall.
- No defect at the endothelial cells if it is removed.
- It is not stratified.
- It is redder because it is rich in erythrocytes.
- It is not elastic. It's easy easily shatterable.
- The top face is rough according to the level of the stage (not smooth)
- It can be destroyed by fibrinolysis.

Conglutination Trombose

- It develops into the lumen from the area where the vascular defect is located.
- It's sticking to the vein wall.
- When removed, the vein wall is endothelial defect, rough, raised somewhere.
- It is layered (because the endothelial cells are broken and blood cells collapse at a certain time interval)
- It is usually lighter in color, because it is less erythrocytes.
- It is not destroyed by fibrinolysis.
- The surface is irregular.
- Can not fully cover vessel lumen

II. ACCORDING TO MORPHOLOGY

- 1. Tail thrombosis: The tip extends like a tail. Conglutination occurs in thrombosis. It is seen in the direction of blood flow in the direction of the blood flow in the arteries.**
- 2. Closed thrombosis: Closes the vein lumen completely.**
- 3. Channeled, perforated thrombosis: The clot is perforated in various directions. Blood flow is provided from the channels in which these holes are formed.**

III. ACCORDING TO LOCALISATION

1. Fibrinolysis

It occurs when the plasmin that is active through plasminogen solves the fibrin.

2. Softening: formed by proteolytic enzymes. Such enzymes, which are usually released from leukocytes, soften the clot and the clot melts away. However, in this case, the thrombosed parts are caused by the embolies. If thrombosis is caused by bacteria, the effect of neutrophils is greater and in this case, the bacteria spread to the embryos and thus the septic embolism develops. Thrombosis is called purulent softening in this way.

4. Organization: Thrombosis occurs completely filling the lumen. The connective tissue precursors from the vessel sub-endothelium first surround the thrombus and then into the connective tissue cells to form granulation tissue.

5. Recanalization: It is formed in regions where blood pressure is high. As fibrin-mediated gaps become more widespread, or endothelium enters the end-organizing regions, ducts form secondary lumen of secondary vessels.

- 5. Reendotelisation:** Endothelial cells surround the surface of the thrombus when adhering to the vascular lumen.
- 6. Hyaline:** It occurs especially in organ thrombosis. Calcification is also occasionally seen. If the calcite is calcified, phlebolite is formed.
- 7. Infection:** The thrombus is suitable for the reproduction of microorganisms. They come infected with the proliferation, in this way, the septic embolies are formed.
- 8. Degradation:** This results in thrombo-embolisms.

EMBO

Def: *An embolus is a detached intravascular solid, liquid, or gaseous mass that is carried by the blood to a site distant from its point of origin.*

Classification

- **Depending upon the matter in the emboli**
 - **Solid:** detached thrombi (thromboemboli), atheromatous material, tumour cell clumps, tissue fragments, parasites, bacterial clumps, foreign bodies.
 - **Liquid:** fat globules, amniotic fluid, bone marrow.
 - **Gaseous:** air or other gases.
- **Depending upon whether infected or not: Sterile or Septic**
- **Depending upon the source of the emboli:**
 - **Cardiac emboli:** left atrium and atrial appendages, infarct in the left ventricle, vegetations of endocarditis.
 - **Arterial emboli :** systemic arteries in the brain, spleen, kidney, intestine
 - **Venous emboli:** pulmonary arteries.
 - Lymphatic emboli can also occur.

Caisson disease / Decompression disease / Diver disease

N₂ (nitrogen) gas normally melts when the depth is lowered in the divers.

When suddenly surfaced, there is no chance of re-melting and it accumulates in gaseous veins.

Depressurisation causes inert gases, which were dissolved under higher pressure, to come out of physical solution and form gas bubbles within the body. These bubbles produce the symptoms of decompression sickness

The pilots have a similar situation. This time, when suddenly elevated, it becomes nitrogen gas which normally melts.

Parasiter embolism : Especially during larval migrations.

Septic embolism

According to route

Direct embolism: monitors blood flow direction. For example, the embolus right ventricle in venus passes through the lungs from here. In the left heart, thromboses in the aorta are transported to arteries and organs such as the brain and kidney.

Retrograde embolism: It occurs in the opposite direction of blood flow. For example, in right heart failure, the right atrium from the superior V. cava may go to the liver by moving counter-clockwise to the embolic bloodstream that is coming.

Paradoxal embolism: embolism that is **from vein to artery** passes the vena cava. Especially when the foramen in the heart is open, it passes through the left heart without passing from the right heart to the lung.

End of Embolism

To the size of the obstructive vein,
whether it is fully clogged,
depends on whether there is a collateral
connection.

Blockage of large vessels with broken
parts of the thrombus results in sudden
death.

If the collateral connection of the
occluded vein is not complete or absent,
the infarct is shaped.