CIRCULATORY DISTURBANCES

1- THROMBOSIS

Definition: Formation of a compact mass formed of blood elements in blood vessel or a heart cavity during life. This mass is called thrombus

- **Causes of Thrombosis:**
  (1) Damage to The Vascular Endothelium:
  Mechanical e.g. trauma, Inflammatory e.g. phlebitis, Degenerative e.g. atheroma, aneurysm.
  (2) Slowing of Blood Stream (Stasis):
  In heart failure, in aneurysmal sacs, in acute inflammation.
  (3) Changes in Blood Composition:
  (a) *Platelets:* increased platelets after operations.
  (b) *Fibrinogen:* Increases during pregnancy.
  (c) *Red cells:* Increase in polycythaemia.
  (d) *White blood cells:* Increase in leukaemia.
  (e) *Plasma:* Decreased plasma volume as in dehydration.

- **Types of Thrombi**
- **According to color:**
  (1) **Pale thrombus*:*** formed of platelets and fibrin.
  (2) **Red thrombus:** formed of R.B.C. and fibrin.
  (2) **Mixed thrombus*:*** formed of all blood element.
- **According to Presence or Absence of Bacteria:**
  (1) **Infected thrombus:** The thrombus contains bacteria.
  (2) **Non infected thrombus (aseptic):** It contains no bacteria.

- **According to Sites of Thrombus:**
  (1) **Thrombosis in Veins:** More common. Two types occur:
  (a) Thrombophlebitis: Thrombosis is initiated by inflammation.
  (b)Phlebothrombosis: Thrombosis caused by factors other than inflammation
- (2) **Thrombosis in Arteries**: Less common than venous thrombosis. Occurs on top of atheroma,
  aneurysms. Arterial thrombosis causes ischaemia.

- (3) **Thrombosis in the Heart**: The following types occur:
  (a) **Mural thrombi:** Occur in heart chamber.
  (b) **Vegetations:** over the valves.

- (4) **Thrombosis in Capillaries**:

- **Fate of the Thrombus**:
  (1) Septic Thrombus: Fragments by the proteolytic enzymes into septic emboli causing pyaemic abscesses.
- **(2) Aseptic Thrombus:**
  - small thrombus is dissolved and absorbed
  - large thrombus undergoes:
  (a) Organization: The thrombus is invaded by capillaries and fibroblast from the vascular wall and change to a fibrous mass.
  (b) Organization and canalization: Occasionally some of the capillaries dilate and allow passage of blood through the thrombus.
  (c) Dystrophic calcification*:* May occur giving a phiebolith.
  (d) Detachment: Forming aseptic emboli causing infarcts.

- **Embolism*:*** Is the process of impaction of the embolus in a narrow vessel.

  Types of Emboli:

  (1) Thrombotic emboli.

  (2) Tumour emboli.

  (3) Parasitic emboli as bilharzia ova..

  (5) Fat emboli.

  (6) Air emboli

  (7) Amniotic fluid emboli

  Effect **of Emboli of Thrombotic Origin: Depends upon:**

  (a) A septjc embolism*:* Produces infarction.

  (b) Septic embolus*:* Produces pyaemic abscess.

- **HAEMORRHAGE**
  Escape of blood outside the blood vessels or cardiac chamber
  Types **of Haemorrhage:**
  (1) **External Haemorrhage:** Escape of blood outside the body.
  (a) Epistaxis*:* Bleeding from the nose.
  (b) Haemoptysis: Coughing of blood from lung
  (c) Haematemesis: Vomiting of blood from stomach
  (d) Melena: blood in the stools from intestine.
  (e) Haematuria: Blood in urine.
  (f) Menorrhagia: Excessive or prolonged menstrual bleeding.

- **(2) Internal Haemorrhage:** Escape of blood inside serous sacs
  (a) Haemothorax: Haemorrhage into the pleura.
  (b) Haemopericardium*:* Haemorrhage into the pericardium.
  (c) Haemoperitoneum*:* Haemorrhage into the peritoneum.

- (3) **Interstitial Haemorrhage:** Escape of blood into the interstitial tissues:
  (a) petichae: mild bleeding.
  (b) Ecchymosis: moderate bleeding.
  (c) haematoma: sever collection of blood.
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- **Effect of Haemorrhage:**
  (1) Small amount: No effect.
  (2) Small amount repeatedly (chronic haemorrhage*):* Causes microcytic hypochromic anaemia.
  (3) Moderate amount: (less than *750* cc.). Is compensated.
  (4) Massive amount: Causes haemorrhagic shock and death.