

Practical Physiology

Ministry of Higher Education and Scientific Research of Iraq

Al-Farahidi University

College of Medical Techniques

Anesthesia Techniques Department

2nd Course

Lab (2)

Bleeding time and Clotting time

- **Platelets (thrombocytes)**: the smallest of our blood cells .
- Whose **function** is to react to bleeding from blood vessel injury by clumping.
- **Platelets** are made in **bone marrow**.
- **life span** is approximately 5–9 days.
- Platelets play a vital role in blood loss by the formation of platelet plugs, which seal the holes in the blood vessels and release chemicals that aid blood clotting.

Platelets (thrombocytes)

- If the platelet number is low called (**thrombocytopenia**), leading to
- excessive bleeding can occur.
- If the number increases, blood clots (**thrombosis**) can form, leading to
- heart attack
- cerebrovascular accidents,
- deep vein thrombosis,
- pulmonary embolism.

Bleeding time

- Is a medical test used to measure the duration of bleeding after skin injured,
- It depended on fibrinogen level and platelets count, and elasticity of the blood vessels wall,
- So this test is used to assess platelets function.

Bleeding time

- Bleeding time is used most often to detect qualitative defects of platelets, such as Von Willebrand's disease, hemophilia, and acute leukemia.
- The bleeding time test is sometimes performed as a preoperative test to determine a patient's likely bleeding response during and after surgery.
- People that used drugs affecting bleeding time such as anticoagulants, anticancer drugs, sulfonamides, aspirin, aspirin-containing preparations, and nonsteroidal anti-inflammatory drugs. Since the taking of aspirin or related drugs is the most common cause of prolonged bleeding time.

There are two methods

1. Duke Method

2. Ivy method

- (Duke method is the most commonly used method)
- **Duke Method:** In this method, an incision is made on **the earlobe, the fingertip, or the heel** because these sites are rich in capillaries.

Materials:

1. Lancet



2. Filter paper



3. Stopwatch

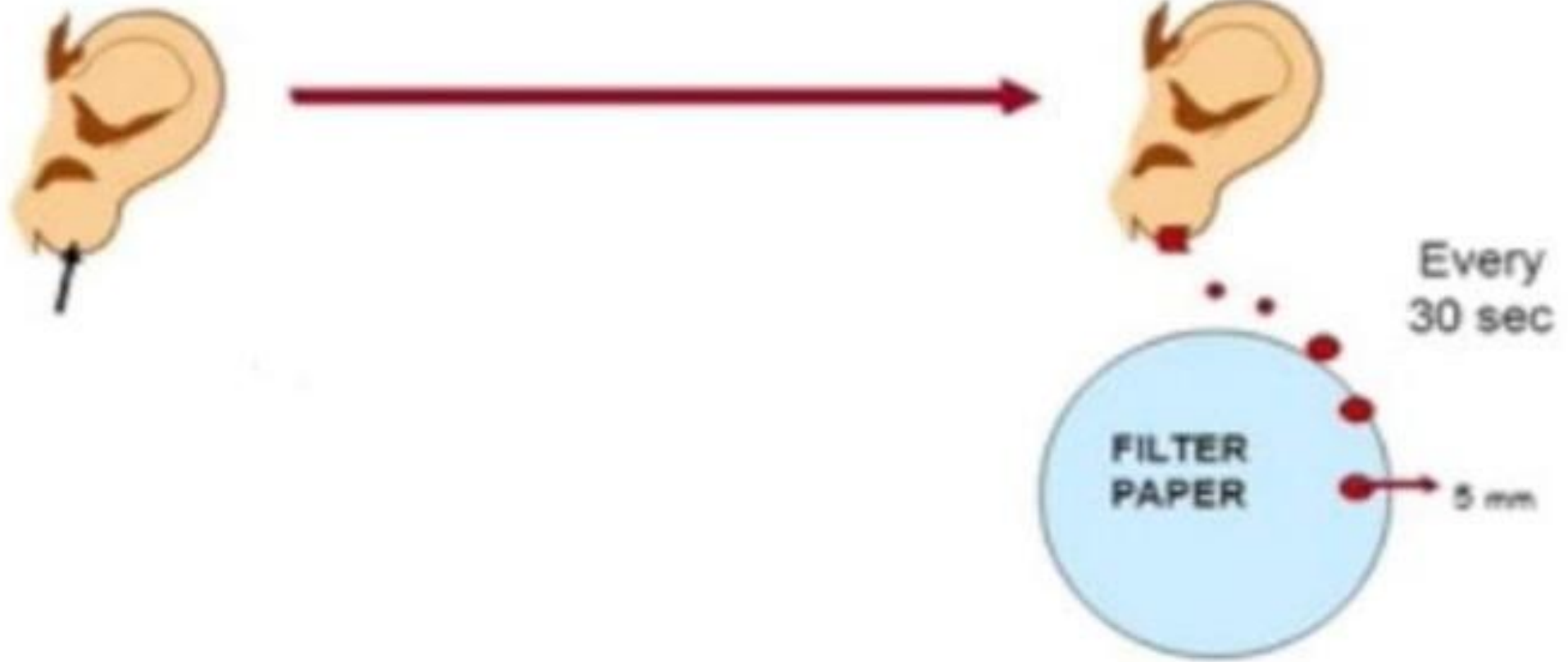


Procedure:

1. Clean the site of the puncture site using alcohol, and allow drying.
2. Puncture deeply using a lancet, so that blood flows out freely (preferably on the earlobe).
3. Then wipe the blood every 30 seconds with a filter paper, the test ceases when bleeding ceases.

- Normal values: The usual time is about 1-3 minutes

Duke Method



Blood clotting, or coagulation

- Is an important process that prevents excessive bleeding when a blood vessel is injured (in which blood is converted from liquid state to jelly state by Platelets and proteins in plasma work together to stop the bleeding by forming a clot over the injury).

Blood clotting, or coagulation

- When a blood vessel is injured or becomes damaged, this can be in the form of a small tear in the blood vessel wall that may lead to bleeding.
- Hemostasis has three major processes namely
 - ❖ the constriction of blood vessels,
 - ❖ activity of the platelets,
 - ❖ and activity of the proteins found in blood (clotting factors).

Blood Vessel Constriction

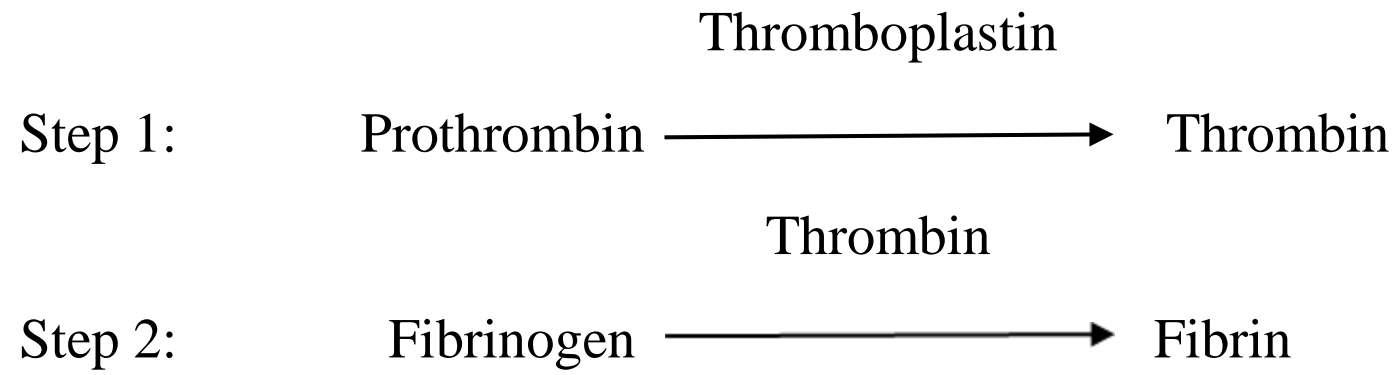
- The body will constrict the blood vessel to control blood loss.
- It will limit the blood flow to the affected area.

Platelet Plug

- In response to the injury, the body activates **platelets**.
- At the same time, **chemical signals are released from small sacs in the platelets** to attract other cells to the area.
- They make a platelet plug by forming a clump together.
- A protein called **the von willebrand factor (VWF)** helps the **platelets** to stick together.

Fibrin Clot

- When a blood vessel becomes injured, the **coagulation factors or clotting factors** in the blood are activated.
- The **clotting factor proteins** stimulate the production of **fibrin**, which is a strong and strand-like substance that forms **a fibrin clot**.
- For days or weeks, this **fibrin clot** strengthens and then dissolves when the injured blood vessel walls close and heal.



Clotting time

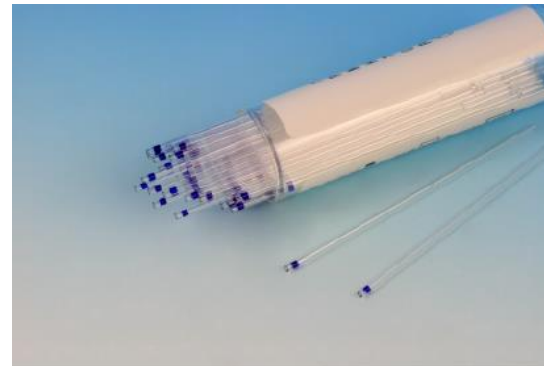
- Is the time required for a measured amount of blood that clots under certain specialized conditions.
- Capillary tube method

Materials

1. Lancet



2. Blue capillary tube



3. Stopwatch



Procedure

1. Sterilization of **fingertip** by alcohol.
2. puncture of the **fingertip** by **the lancet**.
3. Fill **the capillary tube** with blood.
4. **Stopwatch** is started at the moment of the puncture.
5. Break part of the capillary tube every **30 seconds** and continue to break until the formation of fibrin during the break.
6. Read the time when **notice of fibrin**.

Usually, the clotting time measured by this method is in the range 3-6 minutes.

Capillary tube method

