Practical Animal physiology
Lab. 2
(4th Grade)

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Objective:

The objective of these laboratory students at the end of the lab. Should be able to know what is hemostasis , their systems , bleeding and clotting time test and procedures .

Hemostasis

- Is a complex process which causes the bleeding process to stop.
- It refers to the process of keeping blood within a damaged blood vessel.

Hemostasis involves three major steps

- ***Vascular spasm*** - Damaged blood vessels constrict.
- ***Platelet plug formation*** - platelets adhere to damaged endothelium to form platelet plug (*primary hemostasis*) and then degranulate.
- ***Blood coagulation*** - Clots form upon the conversion of fibrinogen to fibrin, and its addition to the platelet plug (*secondary hemostasis*).

- **The primary system:** *comprises platelet function and vasoconstriction.*
- **The secondary system:** *involves coagulation proteins and a series of enzymatic reactions. These two systems work in concert to form a clot; disorders in either system can yield disorders that cause either too much or too little clotting.*

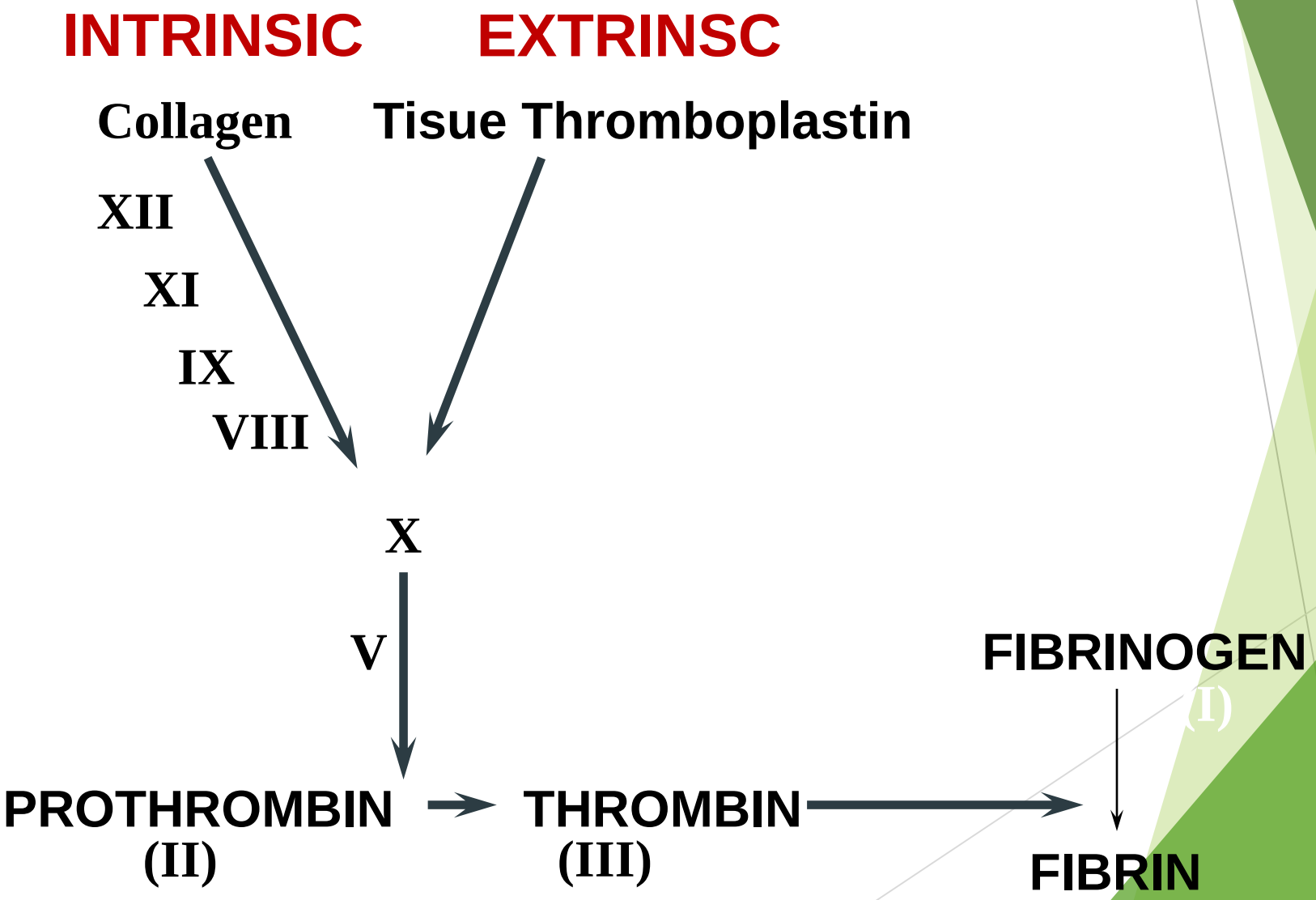
Platelets serve three primary functions:

1. Sticking to the injured blood vessel (called platelet adherence).

2. Attaching to other platelets to enlarge the forming plug (called platelet aggregation).

3. Providing support for the processes of the coagulation cascade.

THE CLOTTING MECHANISM



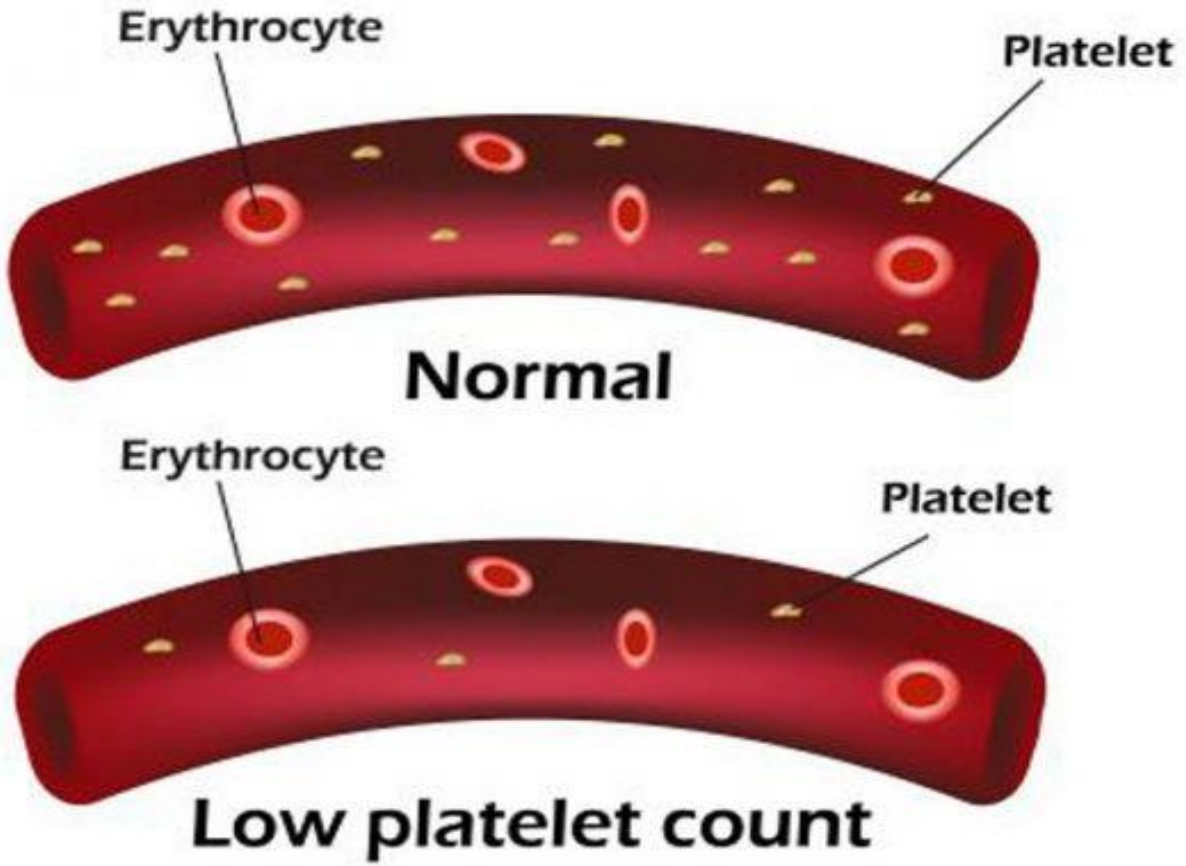
HEMOSTASIS

- **DEPENDENT UPON:**
- Vessel Wall Integrity
- Adequate Numbers of Platelets
- Proper Functioning Platelets
- Adequate Levels of Clotting Factors
- Proper Function of Fibrinolytic Pathway

Prolongation of bleeding time and whole blood clotting time is seen in:

- Thrombocytopenia
- Platelet malfunction (Aspirin)
- Factor VIII deficiency
- Vitamin K deficiency
- Liver disease

Thrombocytopenia



VESSEL DEFECTS

- VITAMIN C DEFICIENCY
- BACTERIAL & VIRAL INFECTIONS

PLATELET DISORDERS

THROMBOCYTOPENIA (INADEQUATE NUMBER OF PLATELETS)

Causes

- DRUG INDUCED
- BONE MARROW FAILURE
- HYPERSPLENISM
- OTHER CAUSES

- **Bleeding time**: The time required for a small cut to stop bleeding. Normal bleeding time is 1 to 6 minutes.
- **Clotting time:** The time required for blood to clot in a glass tube. Normal clotting time is 1 to 10 minutes.

Clotting time - capillary method

- ***Material***

1. Sterile disposable pricking needle or lancet.
2. Stop watch
3. Dry glass capillary tube (narrow diameter 1 top 2 mm, minimum 10 cm long.)
4. Cotton Swab of absorbent cotton.
5. Spirit wetted, cotton swab.
6. 70 % v/v ethyl alcohol

Procedure

Bleeding time

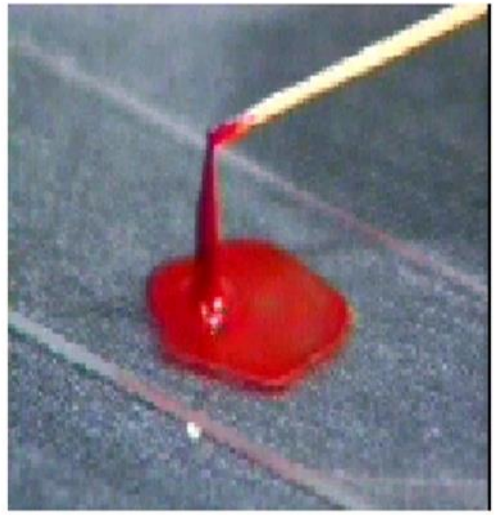
1. Get the patient in a sitting position.
2. Clean the patient's earlobe with 70% alcohol and let dry.
3. Puncture the earlobe to a depth of about 2mm with a lancet.
4. At 30-second intervals wipe the blood drop away completely with a filter paper (do not touch your earlobe when wiping the blood away). Continue this procedure until no more blood stains appear on the filter paper.
5. Calculate the bleeding time.

Clotting Time - Slide Method

The surface of the glass tube initiates the clotting process. This test is sensitive to the factors involved in the ***intrinsic pathway***

The expected range for clotting time is **1-10 min.**

CLOT FORMATION



Procedure

- **Clotting time**

1. Lance your finger to obtain a large drop of blood. Note the time when the drop appears.
2. Fill the capillary tube (non-heparinized) from the finger puncture quickly.
3. Break small piece of the tube at 30-second intervals until the blood shows thread formation.

References :

- https://www.youtube.com/watch?v=hwse9lOMrko.
- https://www.google.iq/search?q=what+is+clotting+time&oq=what+is+clotting+&.
- https://www.youtube.com/watch?v=CamXHWRhX-4&t=122s
- https://www.slideshare.net/AKHTARHUSSAIN14/bleeding-timeclottingtimeptand.

Thank You For Attention.