Sri Aurobindo College of Dentistry

Indore, Madhya Pradesh

INDIA

MODULE PLAN

- TOPIC :HAEMORRHAGE
- SUBJECT:ORAL SURGERY
- TARGET GROUP: UNDERGRADUATE DENTISTRY
- MODE: POWERPOINT – WEBINAR
- PLATFORM: INSTITUTIONAL LMS
- PRESENTER: DR.TEJAS MOTIWALE

CONTENTS

DEFINITION

- Haemorrhage : escape of blood from a blood vessel
- Word haemorrahage is synonmous with bleeding

Damage to vessel

↓

Outflow of blood

↓

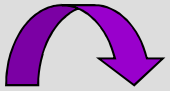
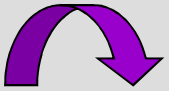
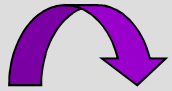
Loss of blood beyond a limit

↓

Life – threatening due to depletion of O_2 & nutrients to tissues

CLASSIFICATION

- Based on the *type of blood vessel / source*

Arterial	Venous	Capillary
		
• Ruptured artery	Ruptured vein	Ruptured capillary
• Pulsatile	Contiuous flow	Oozes from area
• Bright red in colour	Dark in colour	Intermediate

CLASSIFICATION

- Based on *onset of bleeding*

primary	reactionary	secondary
At the time of injury	within 24 hrs	after 24hrs
Stops by clotting	ligature slippage dislodged clot cessation of reflex vasospasm	infection trauma

- ***Warning haemorrhages*** *– bright red stains on dressing which precede sudden & severe haemorrhage*

CLASSIFICATION

- Based on *location*

- External
  
  revealed
  skin bleed

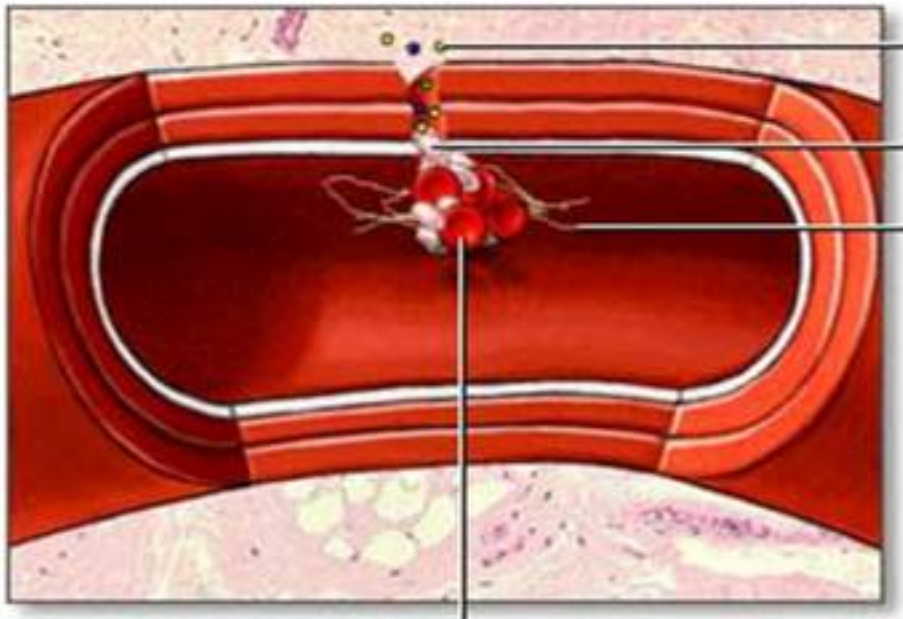
  Internal
  
  concealed
  within bone or soft tissue

HEMOSTASIS

4 IMP STEPS:

1. Injured vessel → constriction(spasm) → reduces blood loss
2. Activation of platelets → platelet plug → primary hemostasis
3. Activation of clotting mechanism → clot forms → secondary hemostasis
4. Fibrous organisation of clot

Blood clot formation



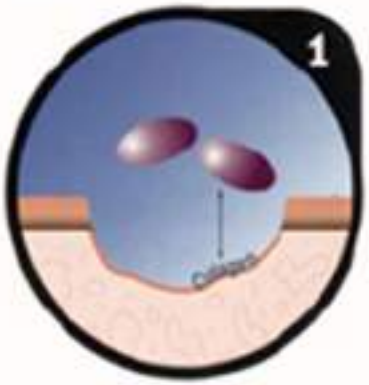
HEMOSTASIS

Primary hemostasis

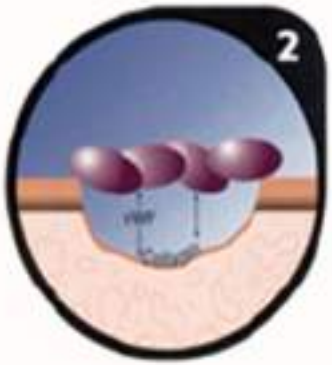
- Process of platelet plug formation
- Stops bleeding from small vessels
- Involves platelet adhesion , release of granules & platelet aggregation

Secondary hemostasis

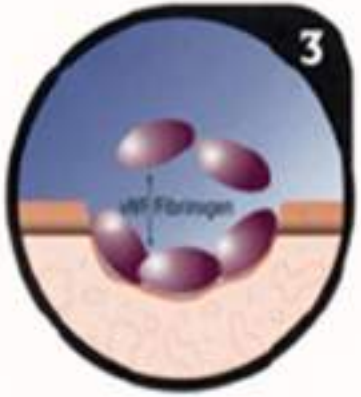
- Activation of clotting process in plasma → fibrin formation → strengthens primary hemostatic plug
- Stops bleeding from larger vessels
- Complex interaction of coagulation factors



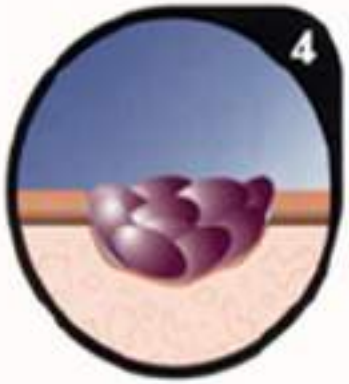
Platelets under shear stress come in contact with exposed collagen from the subendothelium of the damaged blood vessel wall.



The adhesion of platelets to collagen and von Willebrand Factor is, generally, believed to induce the secretion of substances (such as ADP and Serotonin) and the expression of binding sites on platelet glycoprotein (GP) IIb/IIIa.



This secretion, by adhering platelets, induces more platelets to be activated and recruited at the site of the lesion.



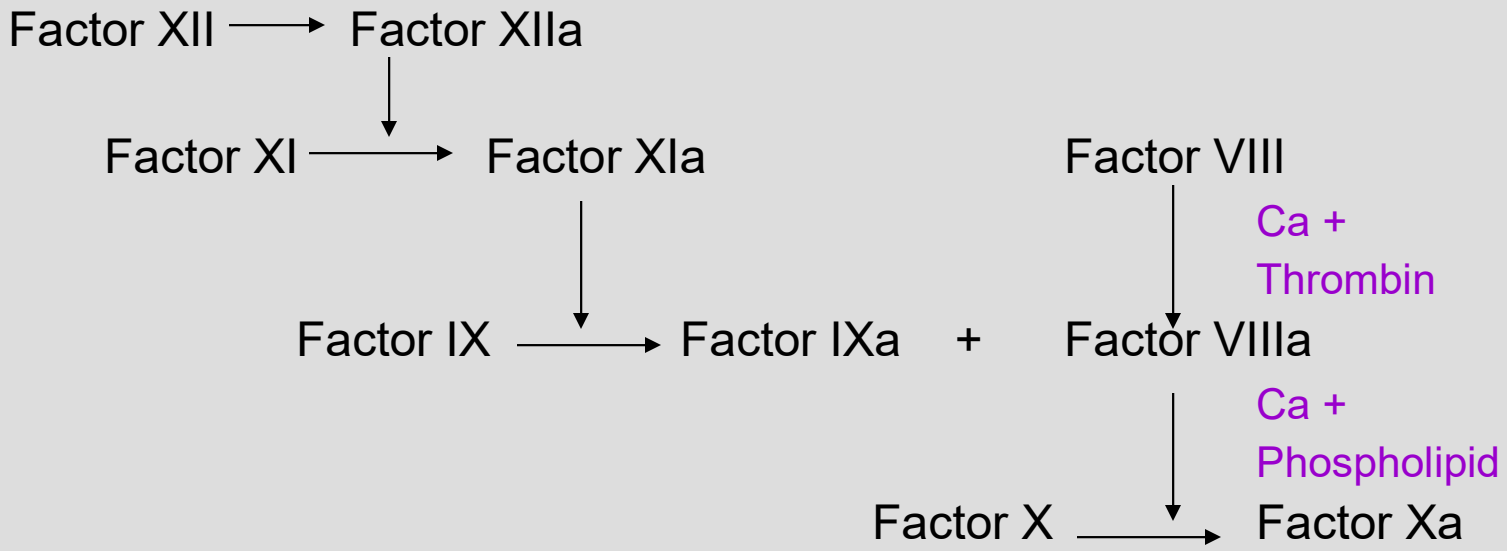
Aggregating at the site of the damage, the platelets form a hemostatic plug, arresting the bleeding.

COAGULATION FACTORS

- I – Fibrinogen
- II – Prothrombin
- III – Tissue factor
- IV – Calcium
- V – Proaccelerin, labile
- VII – Proconvertin
- VIII – Antihaemophilic factor
- IX – Christmas factor
- X – Stuart-Prower factor
- XI – Plasma thromboplastin antecedent
- XII – Hageman factor
- XIII – Fibrin - stabilizing factor

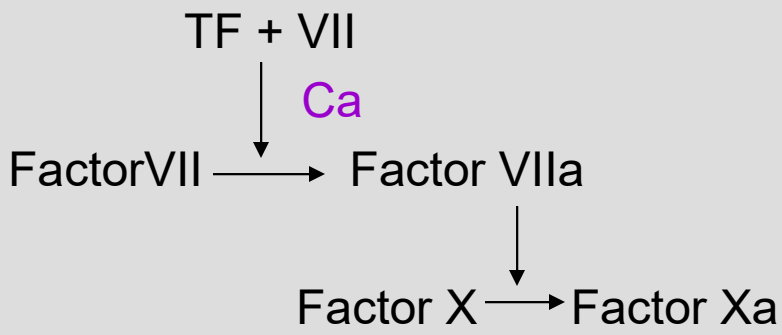
COAGULATION CASCADE

- Intrinsic pathway
  - Contact phase of coagulation
  - Involves factors VIII, IX, XI, XII with Ca & plasma proteins
  - PTT (partial thromboplastin time) screens the intrinsic pathway



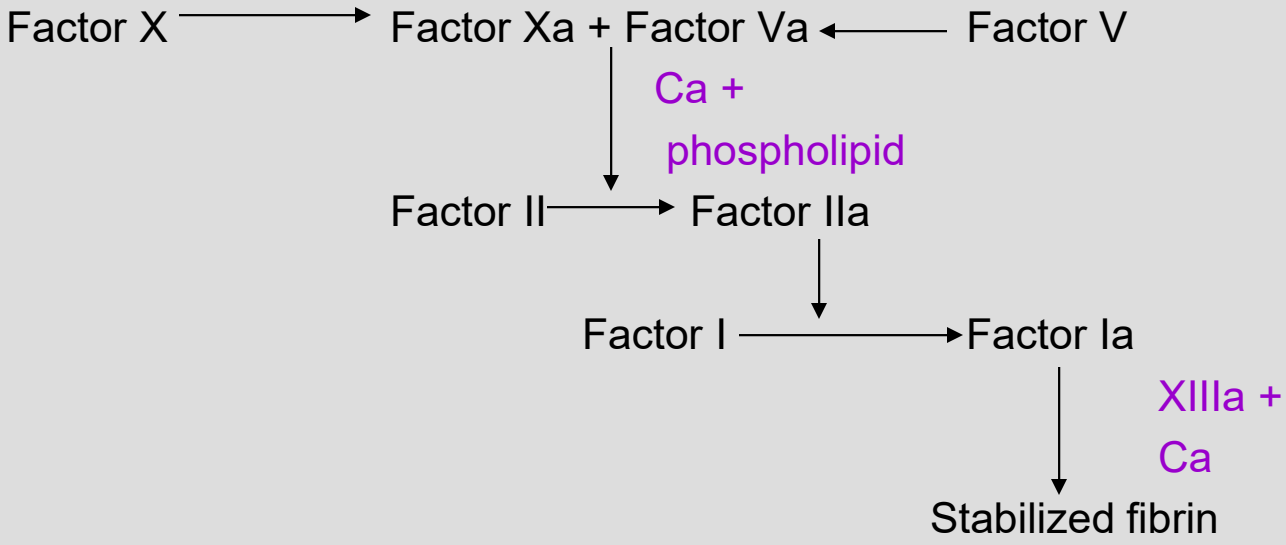
COAGULATION CASCADE

- Extrinsic pathway
  - Tissue thromboplastin from injured tissues
  - Protease complex [factor VII + Ca + tissue thromboplastin] activates Factor X
  - PT [prothrombin time] screens extrinsic pathway



COAGULATION CASCADE

- Final common pathway
  - Prothrombin converted to thrombin
  - Thrombin
    - converts fibrinogen to fibrin
    - activates factor V, VIII, XIII
    - platelet aggregation and secretion
    - **TT** [thrombin time] screens common pathway



MEASUREMENT OF BLOOD LOSS

- Normal circulating blood volume
  - Infants : 80-85 ml/kg
  - Adults : 65-75 ml/kg

- Measuring blood loss:
  - During surgery, swabs are collected & weighed [1gm=1ml]

  - Blood loss = increase in wt of swabs
    +
    volume of fluid suctioned
    -
    volume of fluid used to irrigate

SCREENING TESTS

- **Bleeding time** :
  - Sensitive measure of platelet function
  - BT > 10mins [increased risk of bleeding]
  - Tests : Ivy, Duke, Template
  - Prolonged BT :
    - Thrombocytopenia
    - Von willebrand's disease
    - Platelet dysfunction

SCREENING TESTS

- Platelet count :
  - Normal count : 1,50,000 to 4,50,000/µl of blood
  - 50,000 to 1,00,000/µl → mild prolongation of BT
  - < 50,000/µl → easy bruising[petechia, ecchymoses]
  - < 20,000/µl → spontaneous [intracranial, internal]
- Minor oral surgical procedures – safely done[>80,000 to 1,00,000/µl]
- If less – platelet rich plasma [PRP] transfusion

SCREENING TESTS

- Prothrombin time :
  - screens extrinsic pathway
    - FACTORS VII & X
    - FACTORS I, II, V of common pathway
- Prolonged time
  - Warfarin anticoagulant therapy
  - Deficiency Vit K
  - Deficiency Factors I, II, V, VII & X
- Normal PT = 12-14sec

SCREENING TESTS

- Activated partial thromboplastin time (APTT):
  - Screens the intrinsic pathway
    - Factors VIII, IX, X, IX, XII
    - Factors I, II & V of common pathway
- Prolonged
  - Hemophiliacs
- Normal PTT = < 45secs

SCREENING TESTS

- Thrombin clotting time:
  - Screens the common pathway

- Prolongation :
  - Heparin
  - Hypo/ afibrinogenemia
  - Abnormal fibrinogen

- Prolonged APTT
  - Factor VIII deficiency / hemophilia A
  - Factor IX deficiency / hemophilia B / christmas disease
- Fibrinogen deficiency
  - Prolongs PT, APTT, TCT
- Thrombocytopenia
  - Prolongs BT

CLINICAL EVALUATION

- Personal / family history of bleeding
  - Hemophilia A / B
  - VWD [carrier for factor VIII]
- Previous history of surgery / extraction
- h/o haematuria , GIT haemorrhage, easy bruising, haemarthrosis, menorrhagia, epistaxis
- Any symptoms & signs of liver disease

CLINICAL EVALUATION

- h/o bleeding disorders
- On any medication
  - Anticoagulants
    - Warfarin
    - heparin
  - Platelet antagonists
    - Aspirin
    - NSAIDS
    - Betablockers
    - Calcium blockers

- Conditions that cause increased bleeding
  - Thrombocytopenia
  - Sepsis
  - Uremia
  - HIV
  - Drugs
  - Liver diseases
  - Coagulation disorders

ARTERIES ENDANGERED

- Greater palatine artery
- Sublingual artery
- Facial artery
- Retromolar artery
- Inferior alveolar artery
- Masseteric artery
- Lingual artery
- Tonsillar artery
- Maxillary artery
- Descending palatine artery

Thank you