BLEEDING TENDENCY

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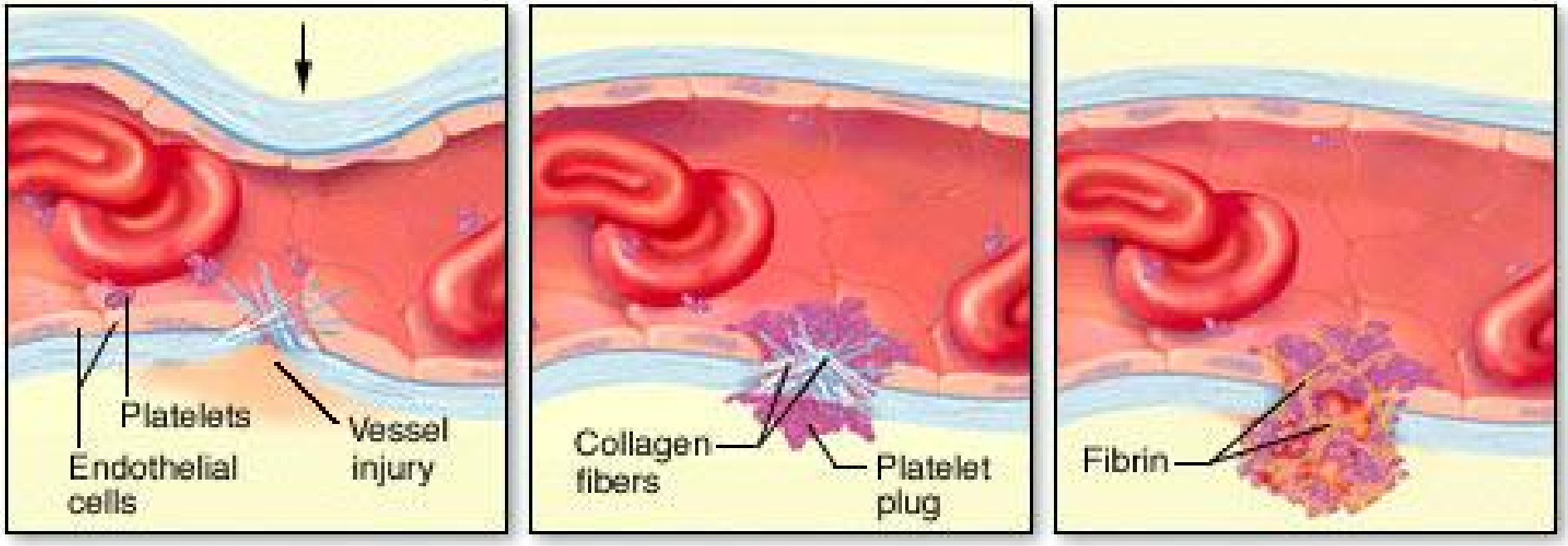
§ Hemostasis (the body's response to stop bleeding) is maintained via three mechanisms:



Introduction

1. *Primary hemostasis*

   - *Vascular spasm.*
   - *Platelet plug formation.*

2. *Secondary hemostasis*

   - *Blood coagulation: clots form upon the conversion of fibrinogen to fibrin, and its addition to the platelet plug.*

Causes of Bleeding tendency

I. Disease of vessels wall:

- Hereditary: hereditary hemorrhagic telangiectasia
- Acquired: vasculitis, scurvy

II. Platelets disorders:

A. Platelets dysfunction (thrombocytopathy):

- Hereditary:
- Acquired: drug-induced (NSAIDS, heparin, antibiotics) , uremia

B- Thrombocytopenia

A. Decreased platelet production: aplastic anemia

B. Increased platelet destruction

- Immunologic processes: ITP
- Non immunologic processes: DIC, TTP

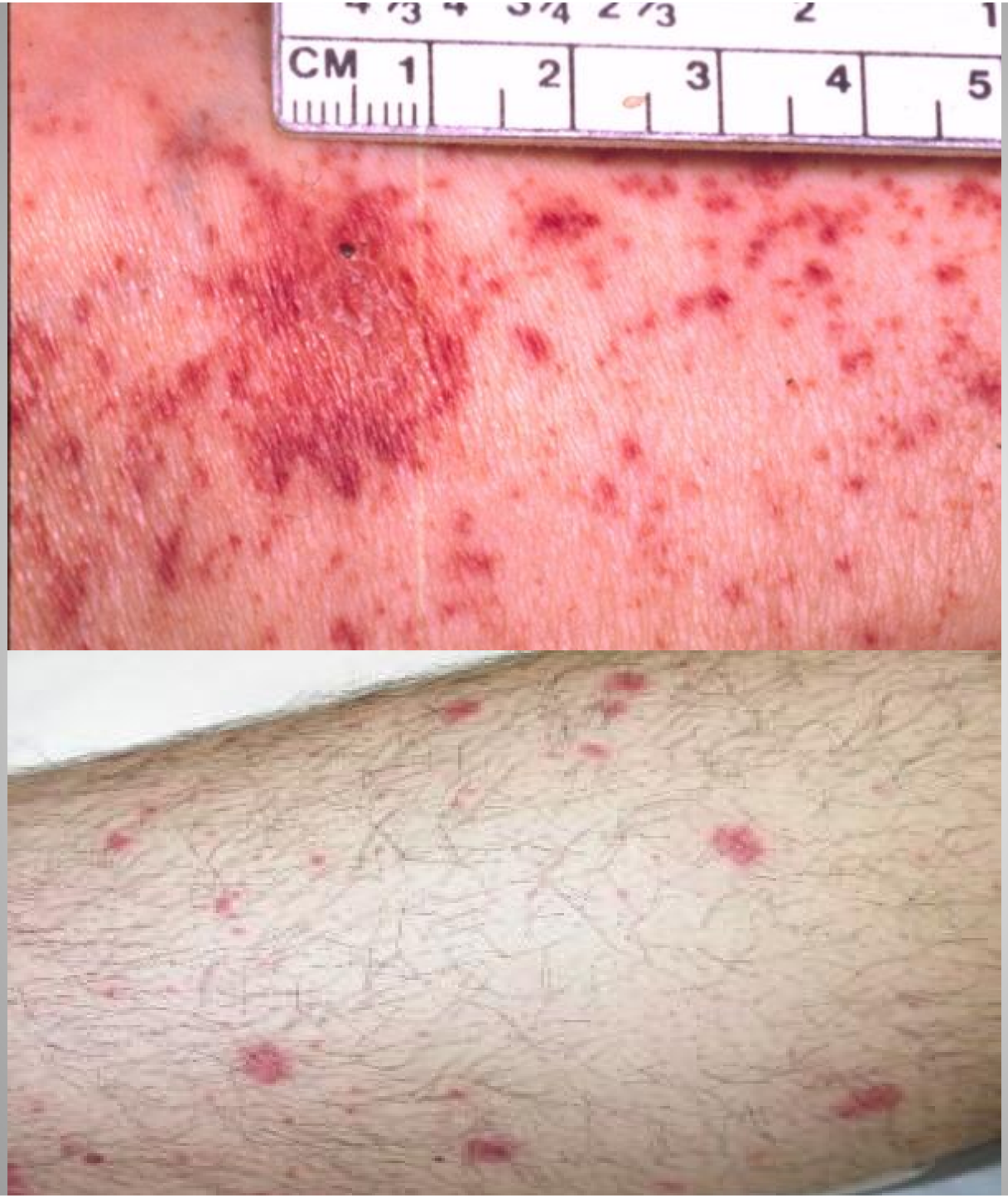
C. Abnormal platelet distribution or pooling: splenomegaly

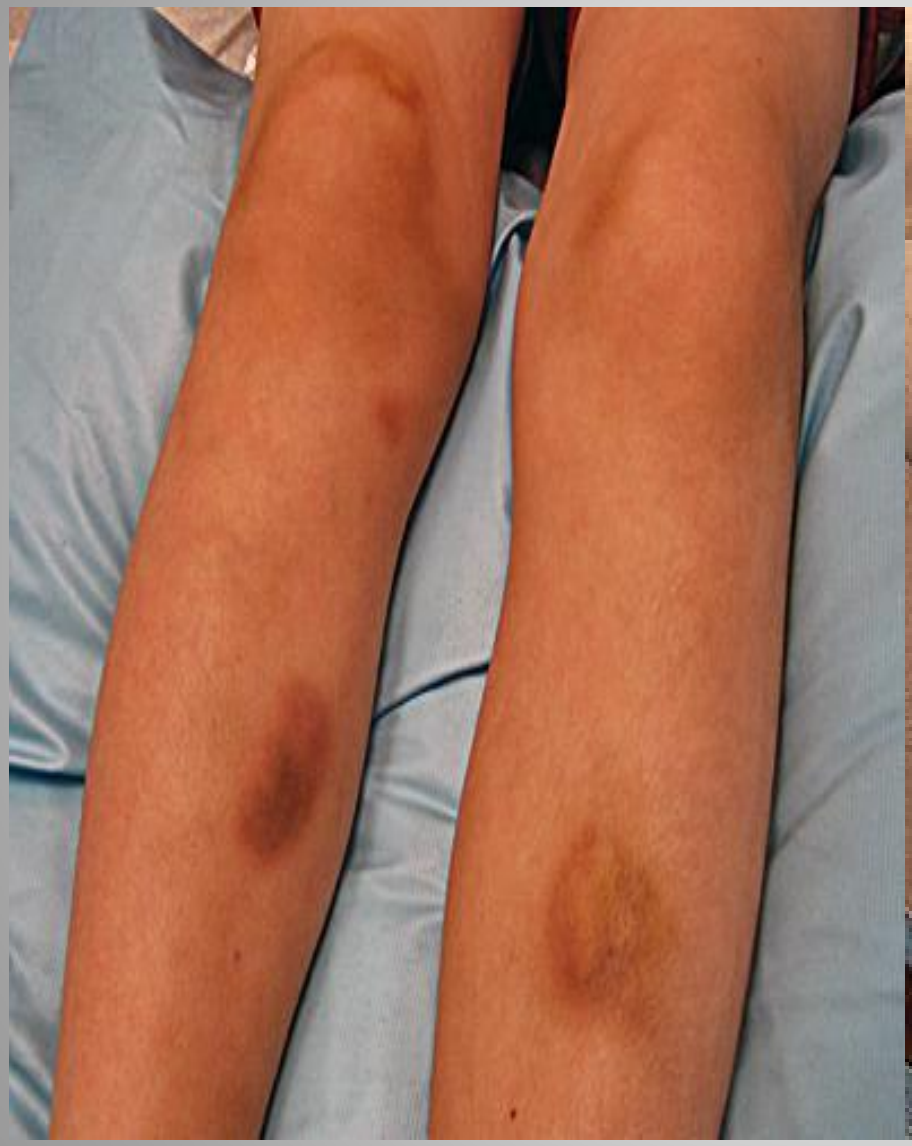
III.Causes of coagulopathy

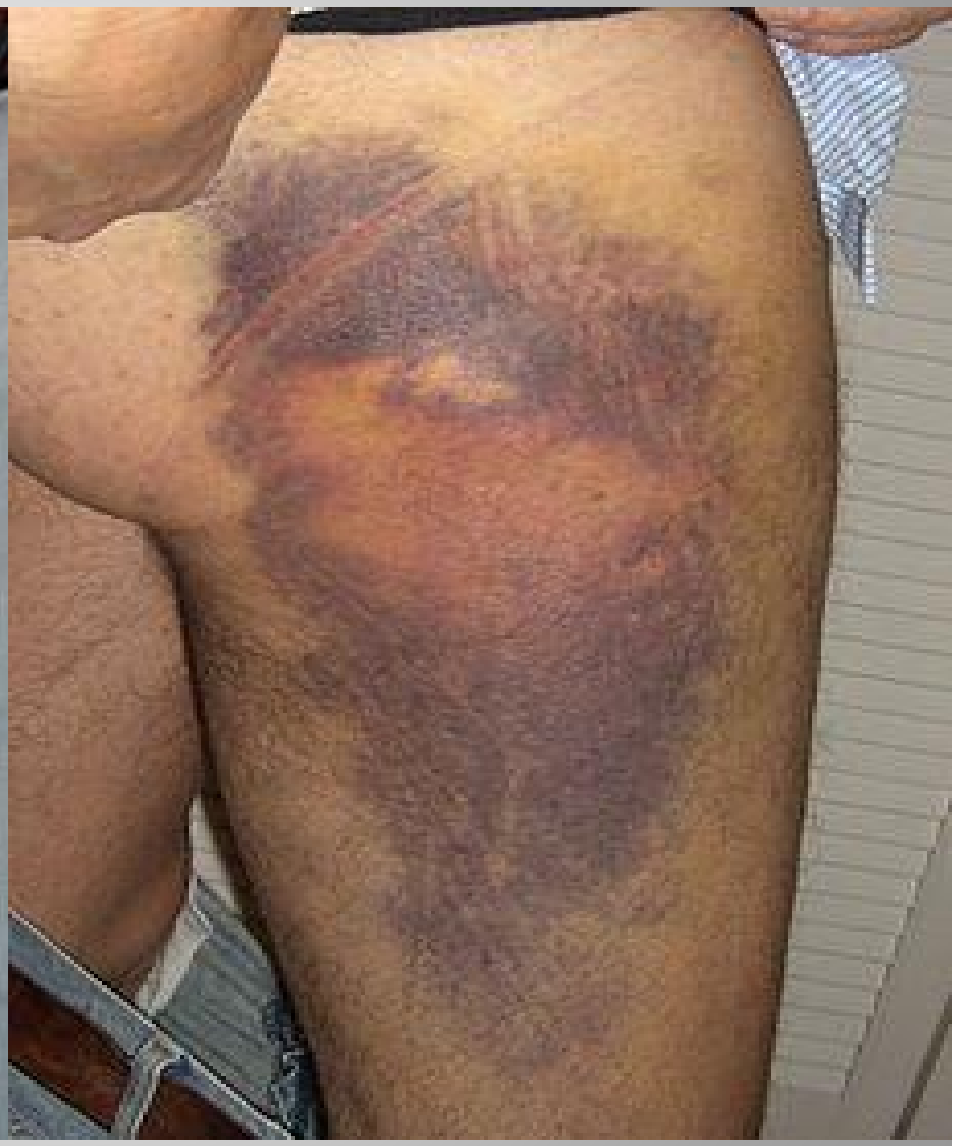
- Congenital underproduction: Hemophilia A and B
- Acquired underproduction: factor II, V, VII, X, XI and XIII deficiencies
- Increased consumption : disseminated intravascular coagulation
- Drugs

How we can differentiate primary

from secondary hemostasis defects?







	Primary hemostasis	Secondary hemostasis
Site of bleeding	Skin, Mucous membranes (epistaxis, gum, vaginal, GIT, GUT)	Deep in soft tissues (joints, muscles, retroperitoneal)
Petechiae	Yes	No
Echymoses	Small and superficial	Large and deep
Bleeding after surgery or trauma	Immediately, usually mild	Delayed (1-2 days), but severe
Investigations	Bleeding time, platelets count	PT, APTT
Examples	Thrombocytopenia, functional platelet disorder, vascular fragility	Coagulation factor deficiency

Investigations

Investigation	Normal range	Situations in which tests may be abnormal
Platelet count	150-400 × 10^9/L	Thrombocytopenia
Bleeding time	< 8 mins	Thrombocytopenia Abnormal platelet function von Willebrand disease
Prothrombin time (PT)	9-12 secs	Deficiencies of factors II, V, VII or X
Activated partial thromboplastin time (APTT)	26-36 secs	Deficiencies of factors II, V, VIII, IX, X, XI, XII Heparin therapy Antibodies against clotting factors

PT : 2+5+10

7

PTT : 2+5+10

8 9

11 12

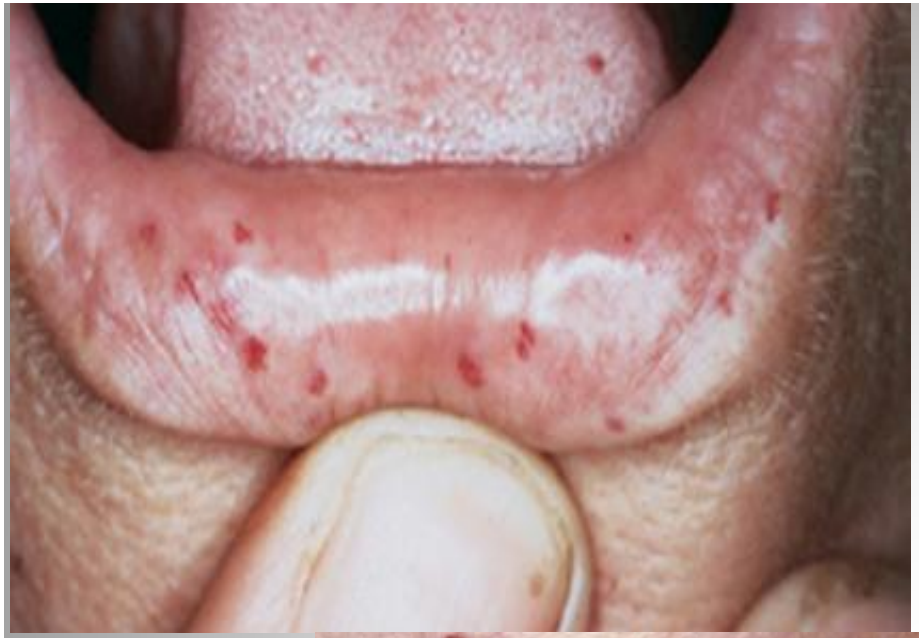
- 24-year-old female presents with a two days history of *intermittent nose bleeds*.
- Examination was normal except that she has numerous *bruises*, mainly over her limbs but also over her trunk and *a petechial rash* over her shins.

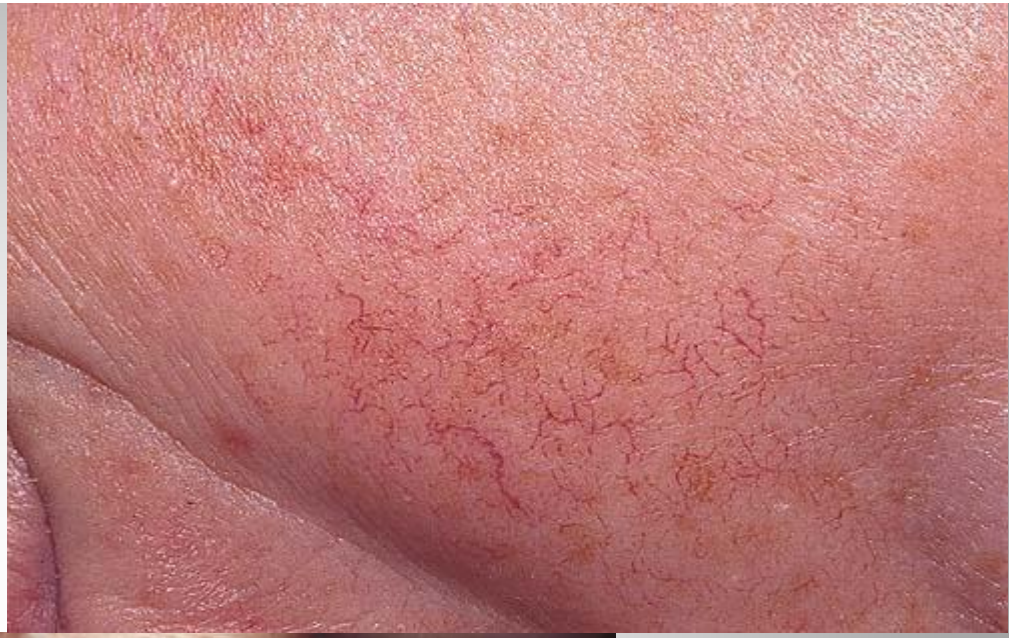
Q1: What is the type of hemostatic defect she has?

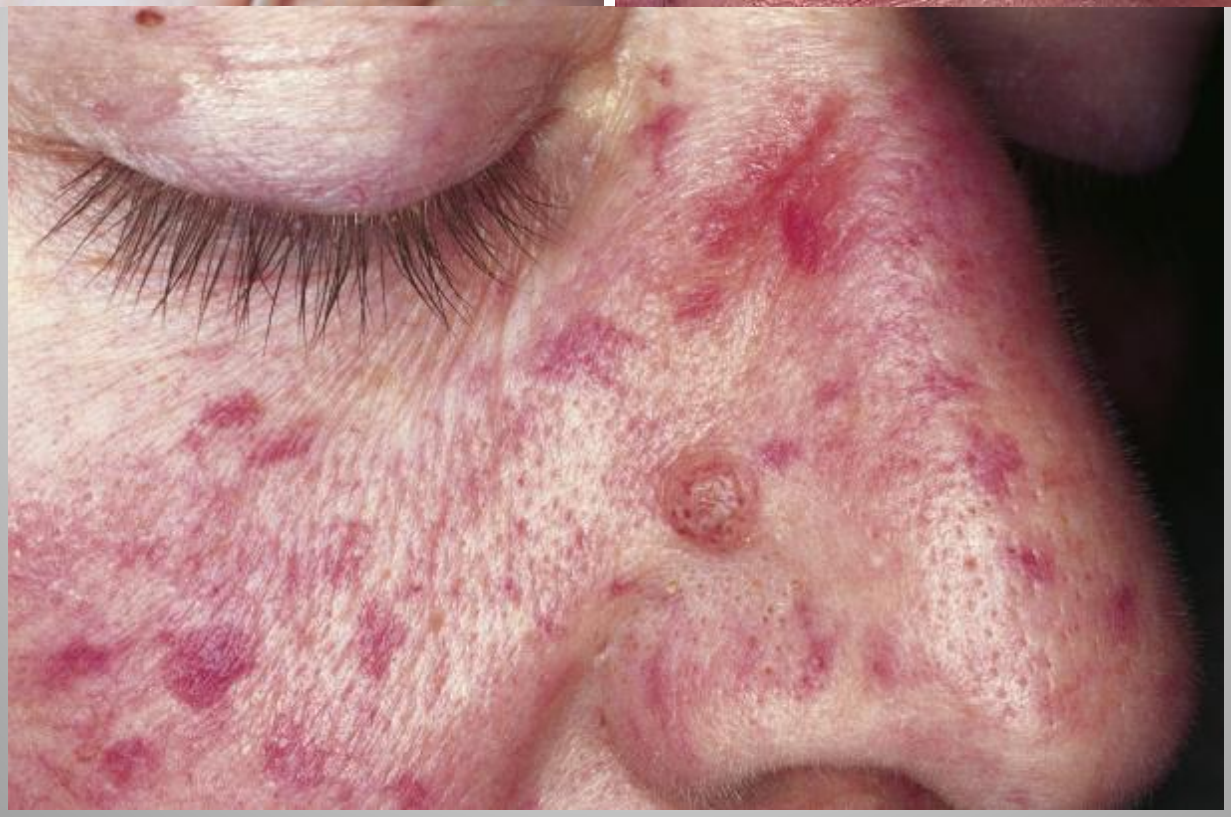
Q2: What are further investigations you want to do?

Hereditary hemorrhagic telangiectasia (HHT)

- HHT characterized by telangiectasia and small aneurysms are found on the fingertips, face and tongue, and in the nasal passages, lung and gastrointestinal tract (GIT).







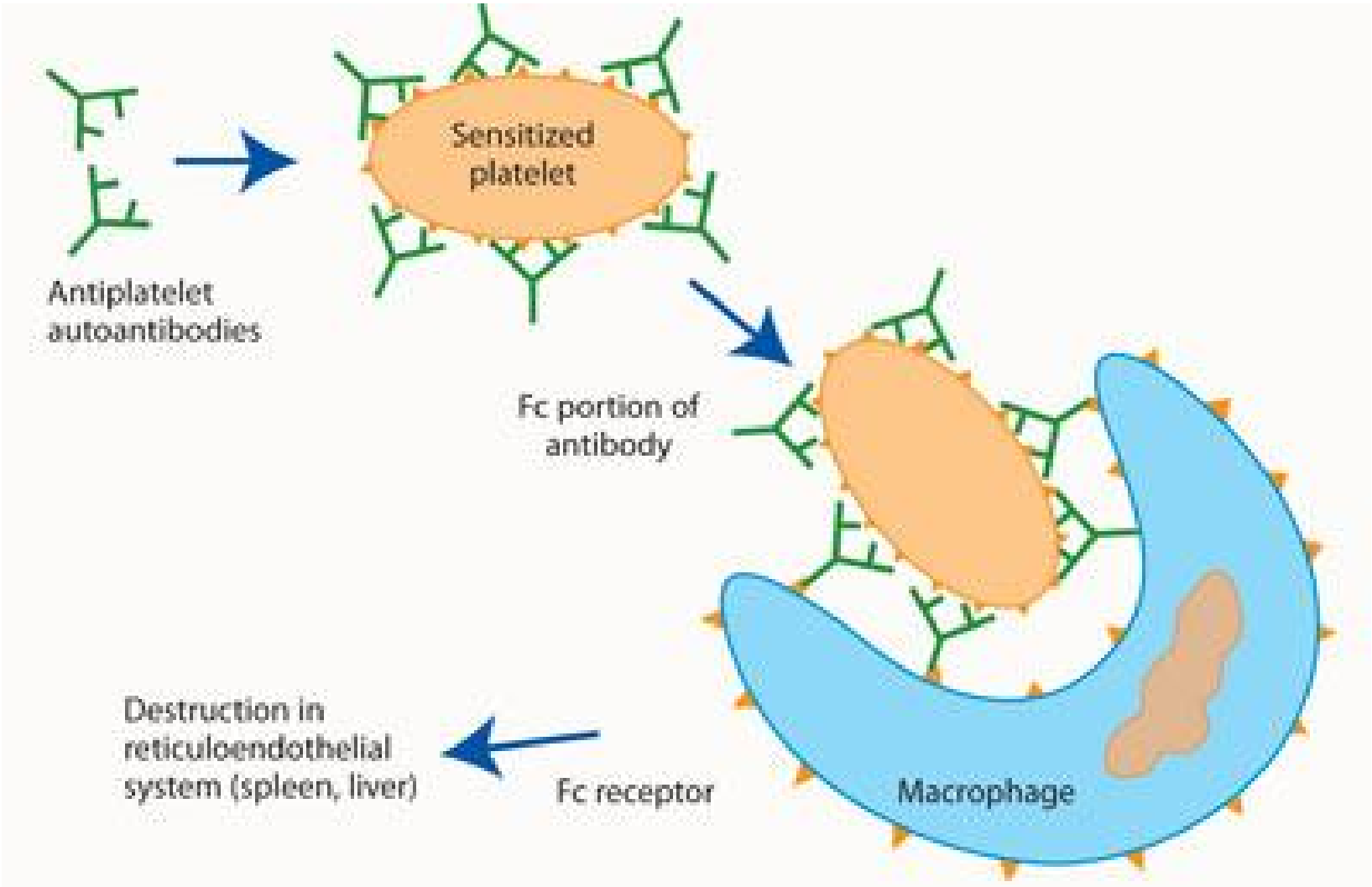
- Pulmonary arteriovenous malformations (PAVMs)
  - Arterial hypoxemia
  - Paradoxical embolism
- Recurrent bleeds, particularly epistaxis
- Iron deficiency due to occult GI bleeding.

Treatment

- Difficult
- Treatment of complications:
  - Regular iron therapy.
  - Local cautery or laser therapy may prevent single lesions from bleeding
  - If there are PAVMs ablation by percutaneous embolization
- Medical therapies (estrogen)

Immune Thrombocytopenic Purpura

- The presence of autoantibodies, against platelet membrane glycoprotein IIb-IIIa, causes the premature removal of platelets from the circulation.
- The cause:
  - Majority: unknown
  - Minority: such as viral (HIV), connective tissue diseases (SLE), malignancy (CLL), and pregnancy.

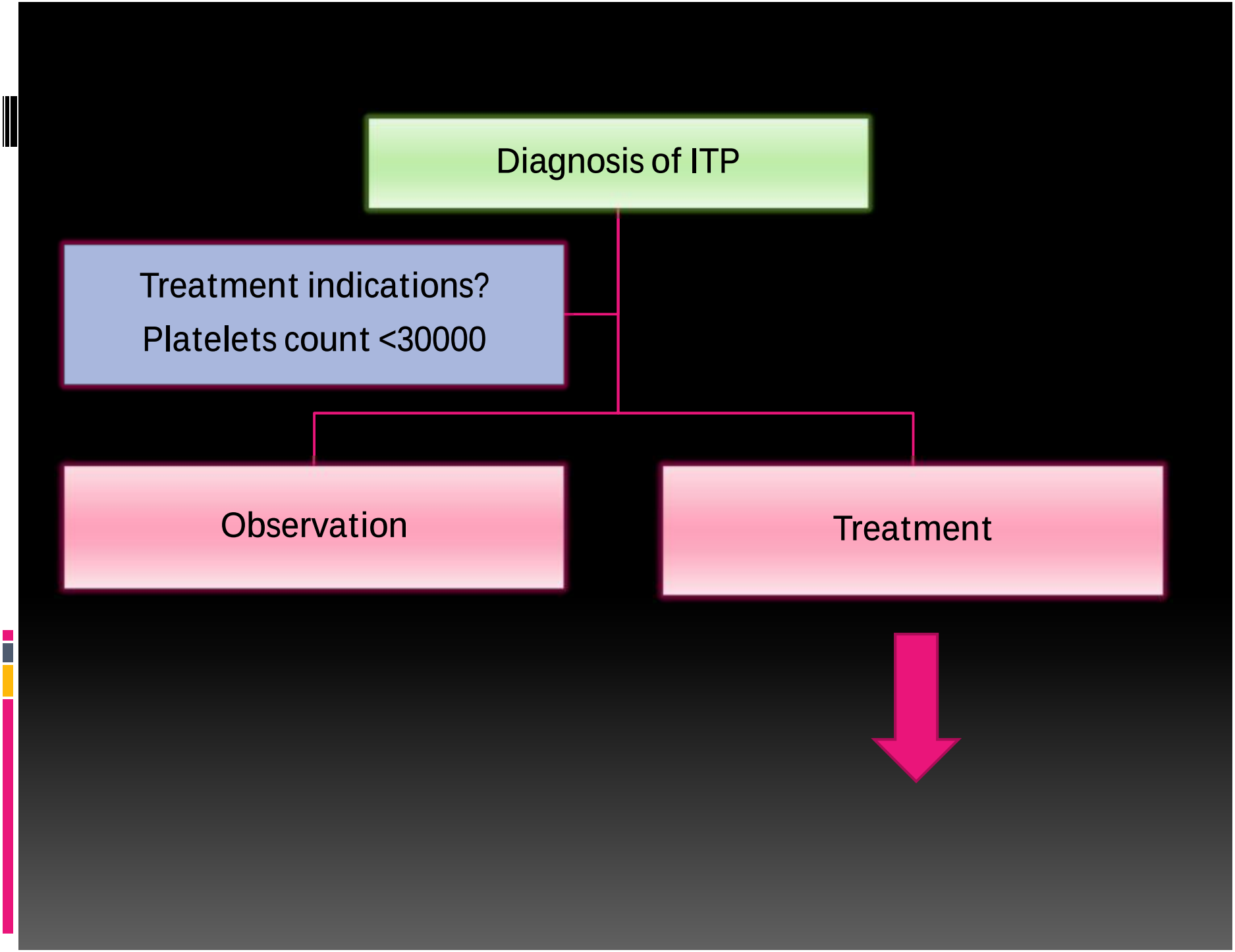


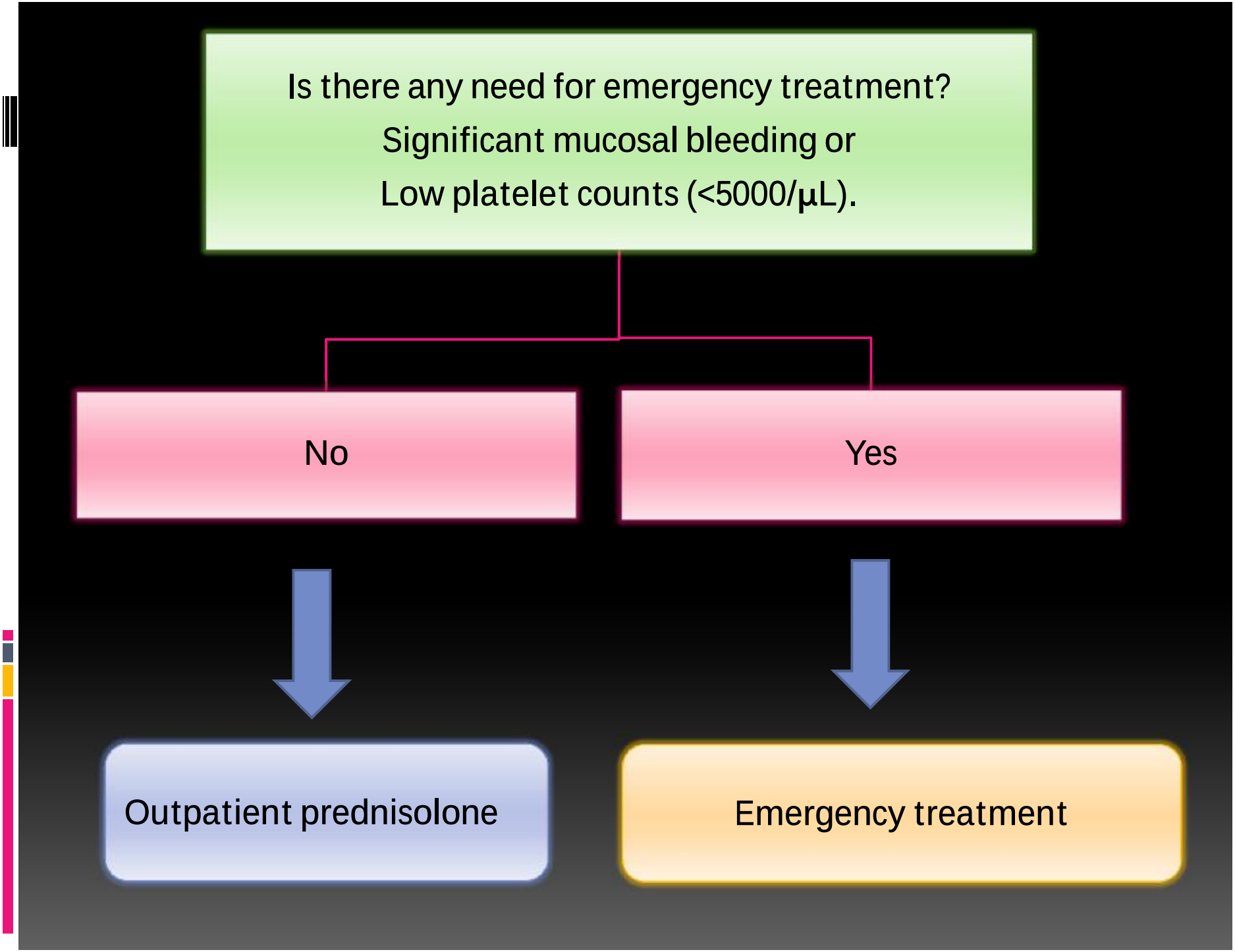
Clinical features

- Common signs and symptoms include: menorrhagia, epistaxis, gingival bleeding, hematuria, gastrointestinal bleeding, petechiae, ecchymosis.
- In severe cases intracranial hemorrhage can occur.

Diagnosis

- Complete blood count shows isolated thrombocytopenia.
- Bleeding time
- Bone marrow is not necessary for diagnosis?

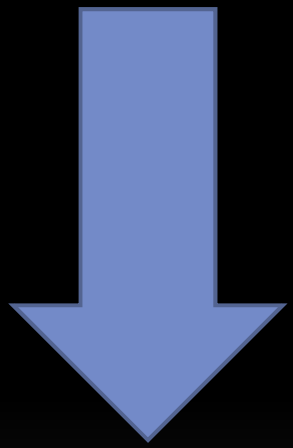




Emergency treatment

- Platelet transfusions
- Intravenous gamma globulin
- Methylprednisolone
- Chemotherapy (vincrestin)
- Rh0(D) immune globulin
- Recombinant factor VIIa

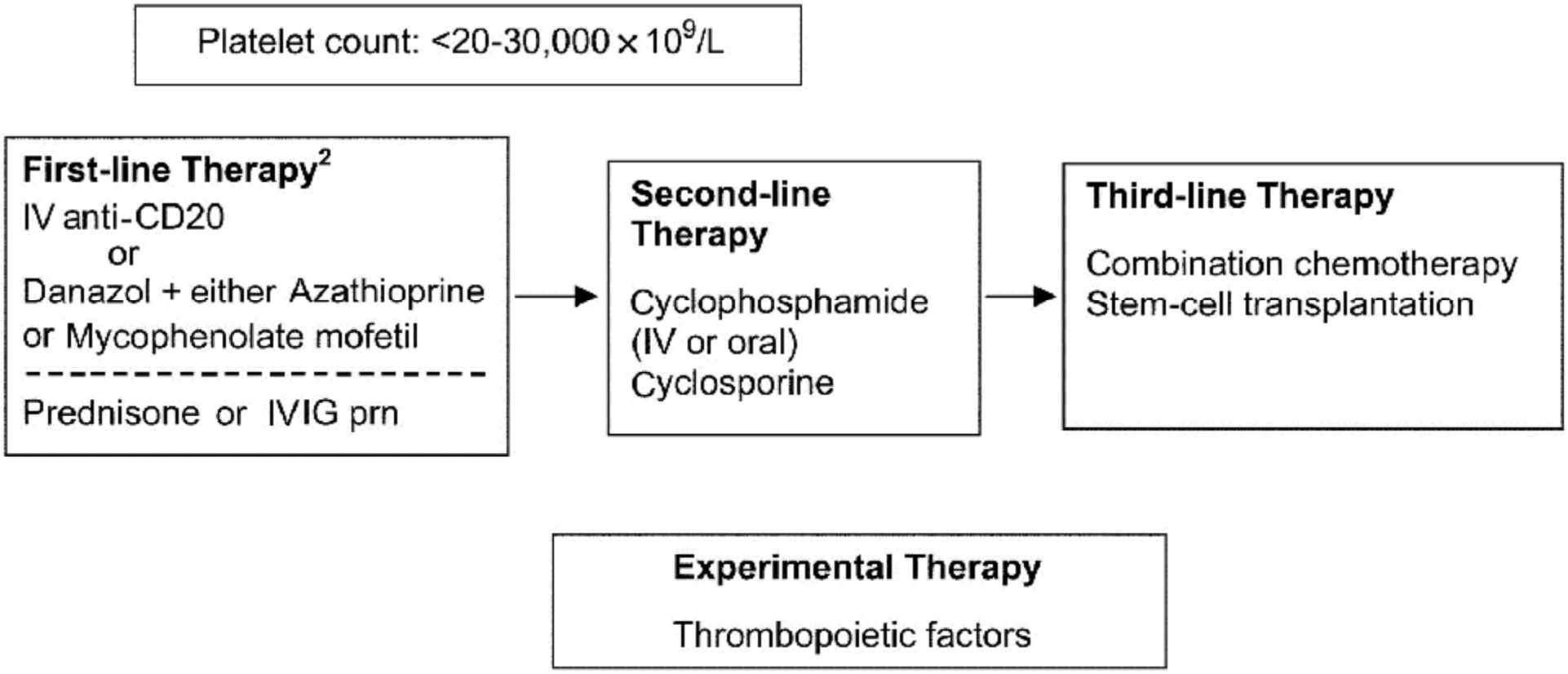
- *Prednisolone (1mg/kg):* the platelet count rises in response to therapy but may fall again when the dose is reduced or stopped.



- *Splenectomy*: If a patient has steroid resistance, two relapses, or steroid dependent.

- *If significant bleeding persists despite splenectomy*: chemotherapy or *rituximab, dapson or colchicin* or repeated infusions of intravenous immunoglobulin should be considered.

Treatment of Patients Failing Splenectomy[1]



- Further investigations which are shown below:
- Hemoglobin 11 g/ dL
- White cell count 10 x 109/L
- Platelets 5 x109/L
- Blood film: Thrombocytopenia

- What would you advise as the next step in her management?
- Intravenous immunoglobulin
- Observation
- Splenectomy
- Prednisolone

Assessment Question

What is the most commonly identified antigenic target of the ITP autoantibodies?

A. VH1
B. GP IIb/IIIa
C. ITP III
D. GP IVc/IX

Assessment Question

In order to make the diagnosis of ITP, a bone marrow biopsy must be performed.

A. True

B. False