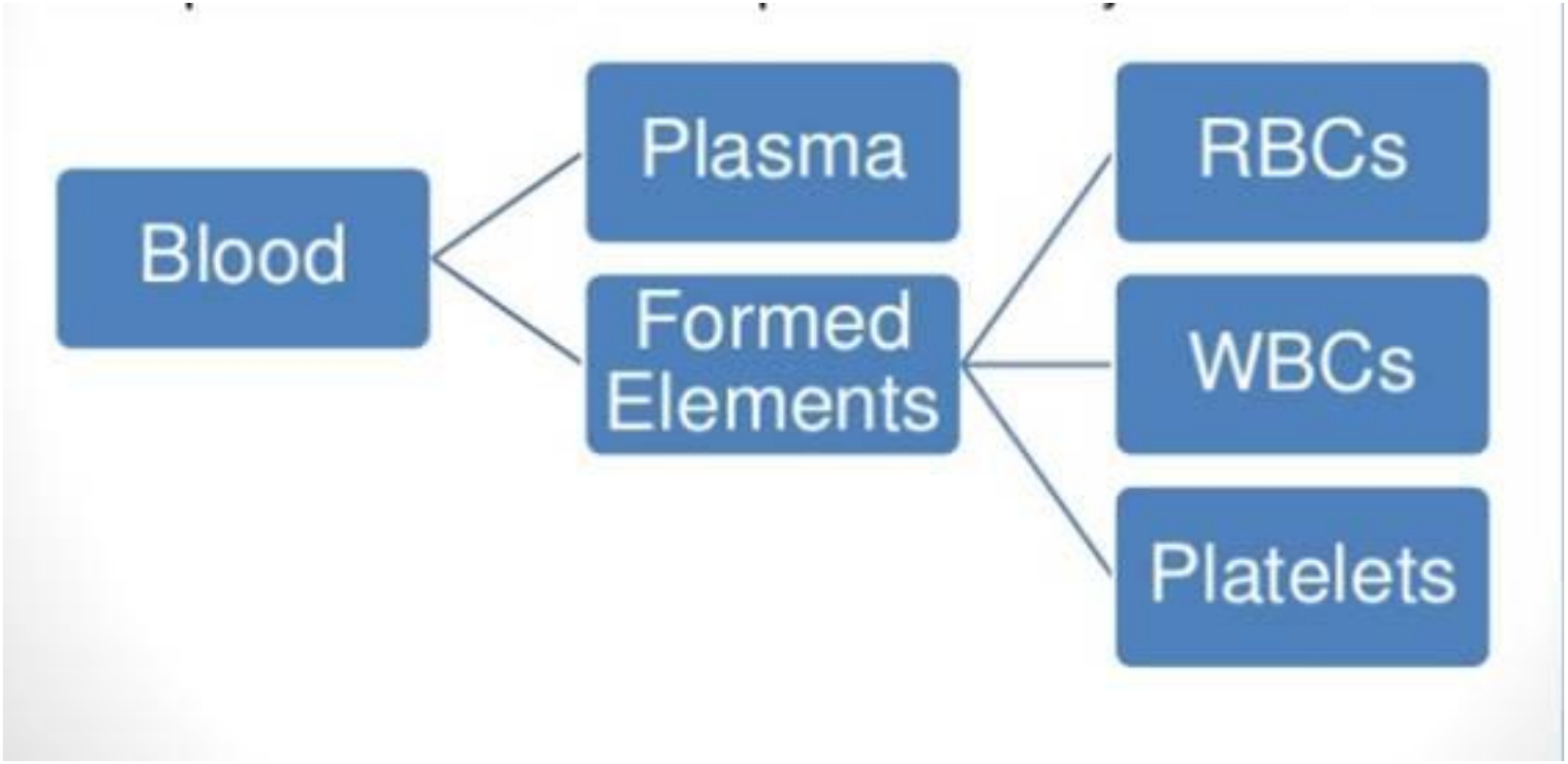
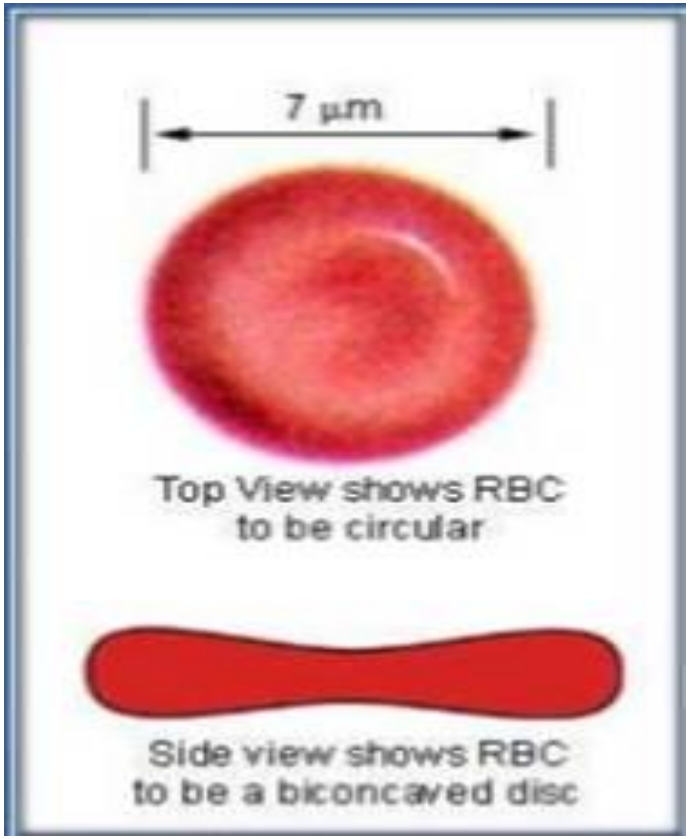
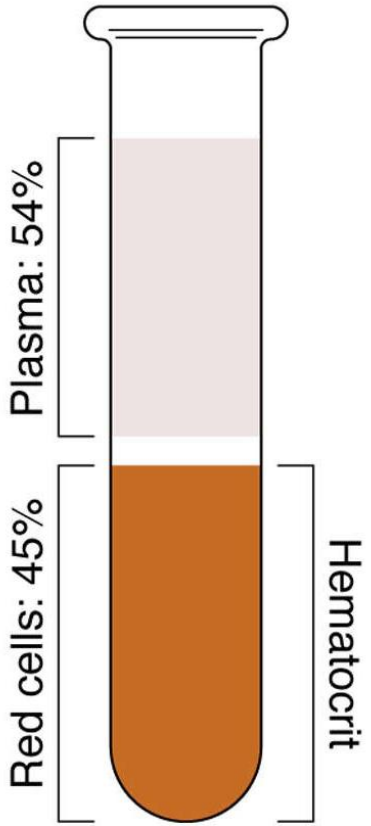
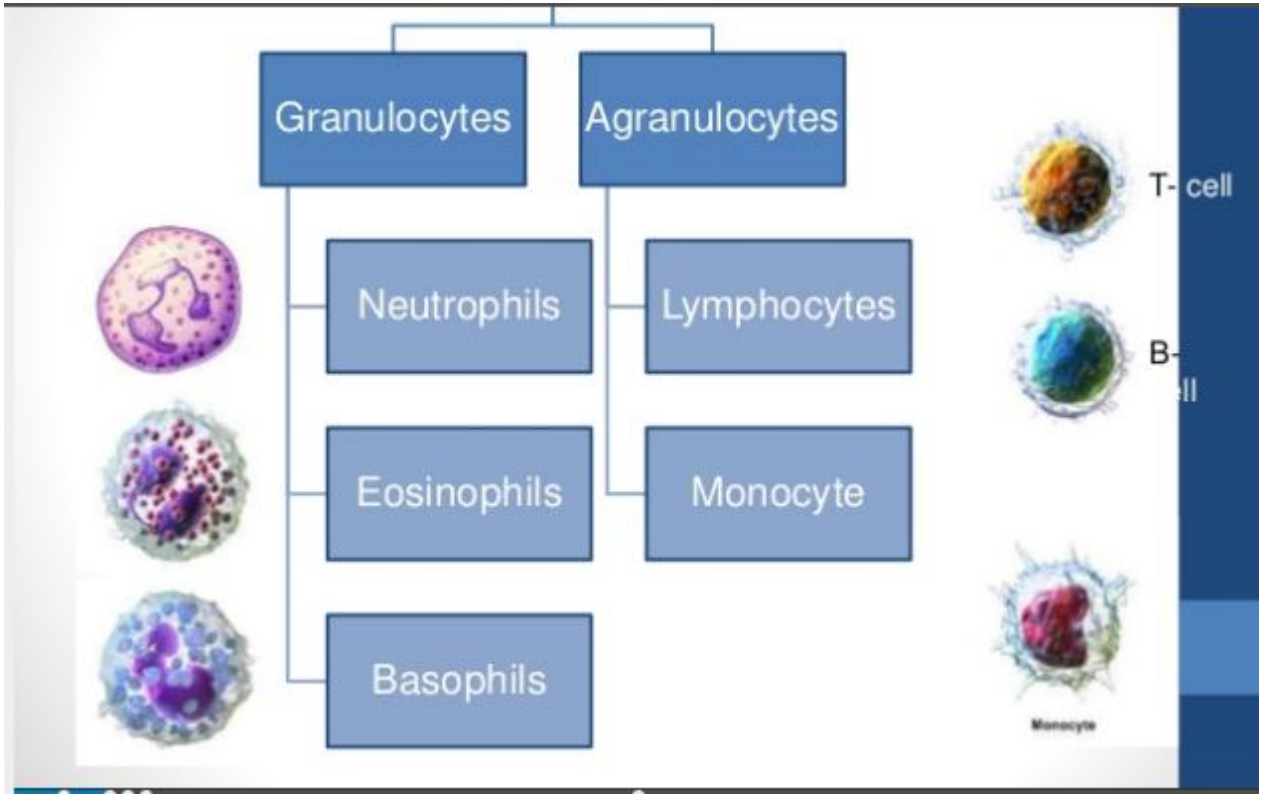
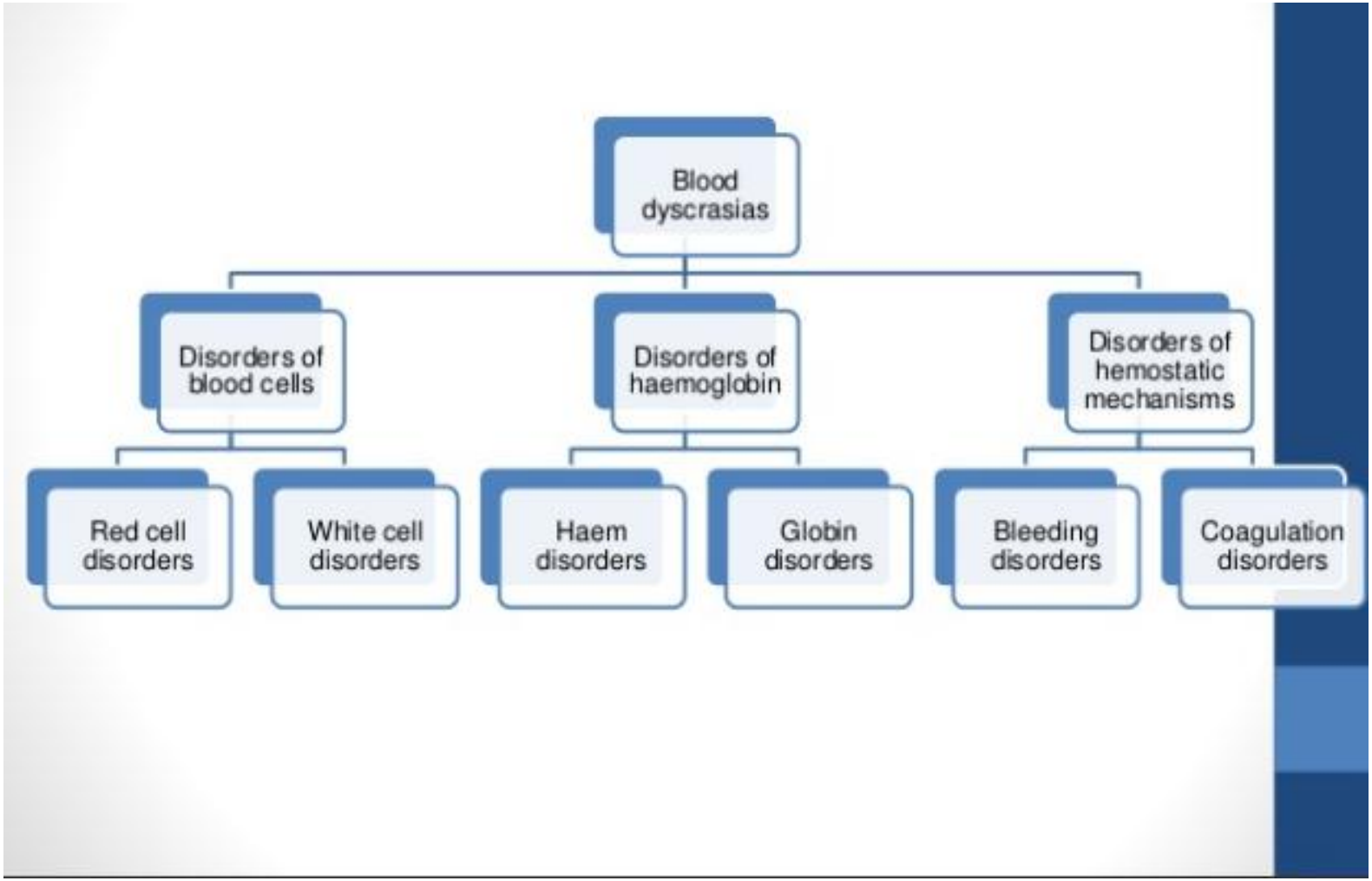
Signs and symptoms of blood disorders


Blood
Plasma
Formed Elements
RBCs
WBCs
Platelets


7 µm
Top View shows RBC
to be circular
Side view shows RBC
to be a biconcaved disc

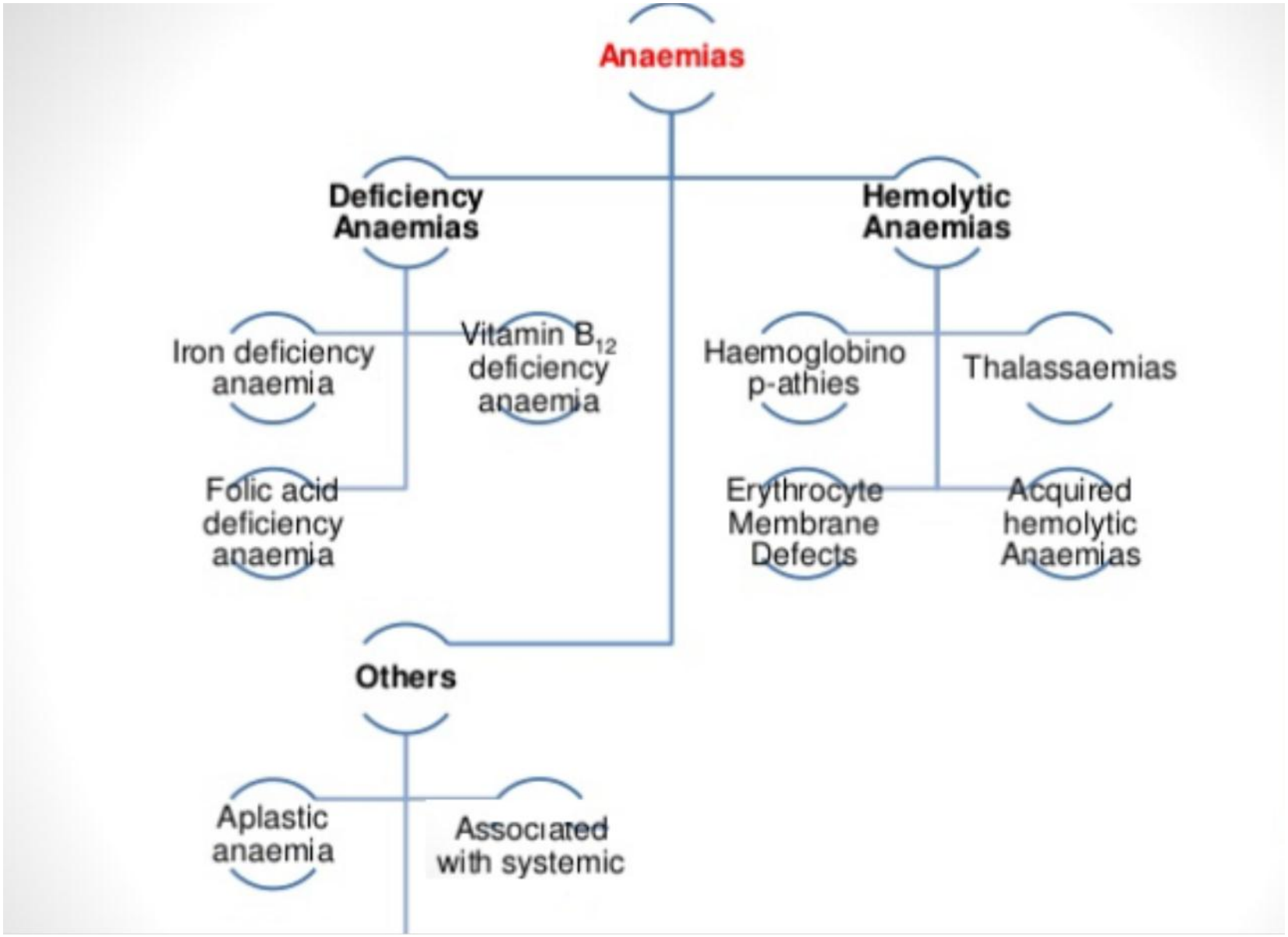

Plasma: 54%
Red cells: 45%
Hematocrit


Granulocytes
Agranulocytes
Neutrophils
Lymphocytes
Eosinophils
Monocyte
Basophils
T- cell
B-
Monocyte


Blood dyscrasias
Disorders of blood cells
Disorders of haemoglobin
Disorders of hemostatic mechanisms
Red cell disorders
White cell disorders
Haem disorders
Globin disorders
Bleeding disorders
Coagulation disorders

Abnormalities of red cells	anaemia (too few red cells), polycythaemia (too many red cells)
Abnormalities of platelets	thrombocytopenia (reduced platelet numbers), thrombocytosis (increased platelet numbers)
Abnormalities of white cells	neutropenia (reduced neutrophil numbers) and leukaemia (marked abn increased numbers).

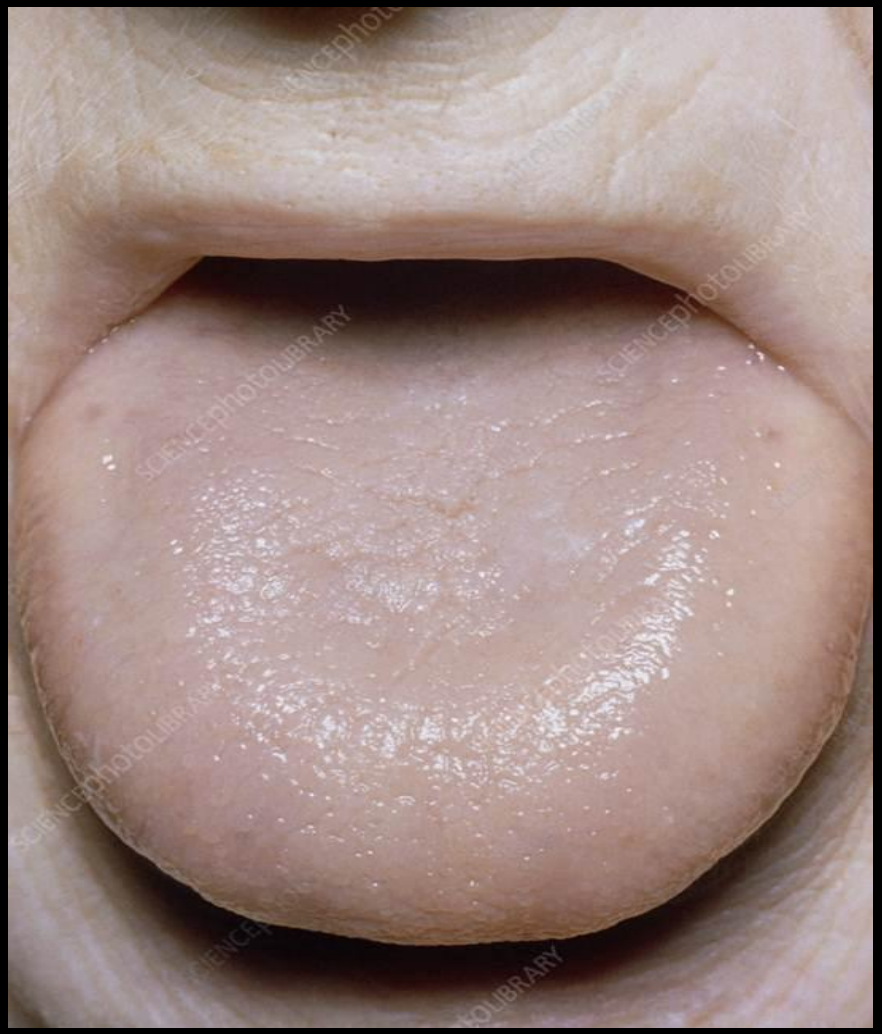
Abnormalities of clotting factors	haemophilia (clotting factor deficiency) and increased tendency to clotting (e.g. Factor V Leiden).
Reductions in bone marrow FUNCTION	myelofibrosis, bone marrow infiltration
Cancers of lymph nodes	(lymphoma).
Abnormalities of immunoglobulin	myeloma (monoclonal overproduction)


Anaemias
Deficiency Anaemias
Hemolytic Anaemias
Iron deficiency anaemia
Vitamin B_{12} deficiency anaemia
Folic acid deficiency anaemia
Haemoglobino p-athies
Thalassaemias
Erythrocyte Membrane Defects
Acquired hemolytic Anaemias
Others
Aplastic anaemia
Associated with systemic

anemia

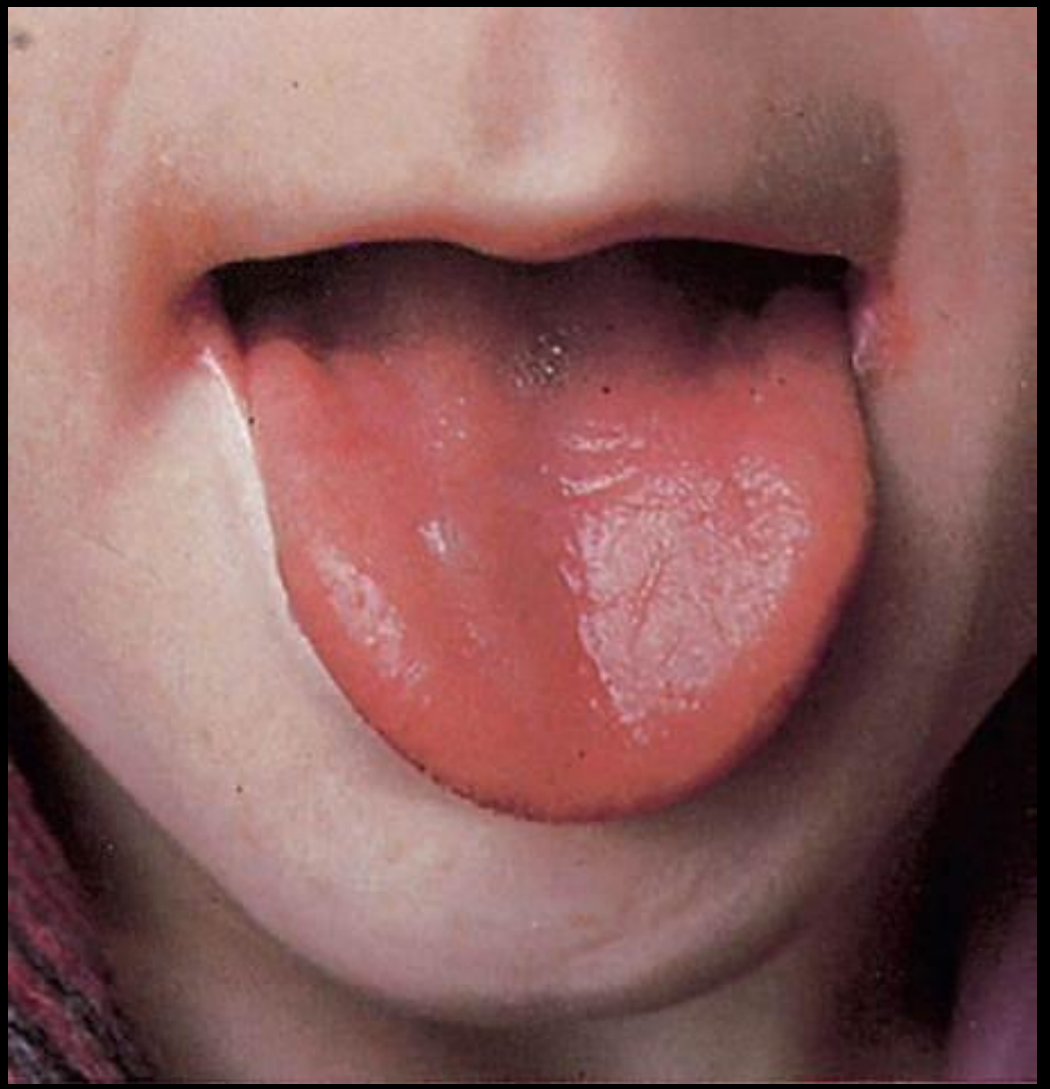
- In anemia = low number of red blood cells = a decrease in oxygen delivery to tissues.
- patient present with fatigue, Tiredness, dyspnea, palpitation, chest pain (due to exacerbation of angina pectoris) and , headache, dizziness, tinnitus, lack of concentration.
- Signs: Pallor of skin and mucous membranes.

Severe pallor

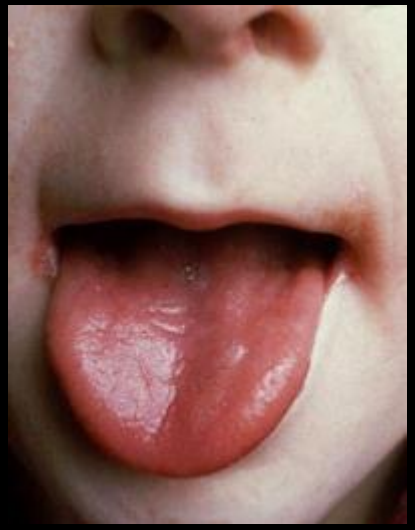


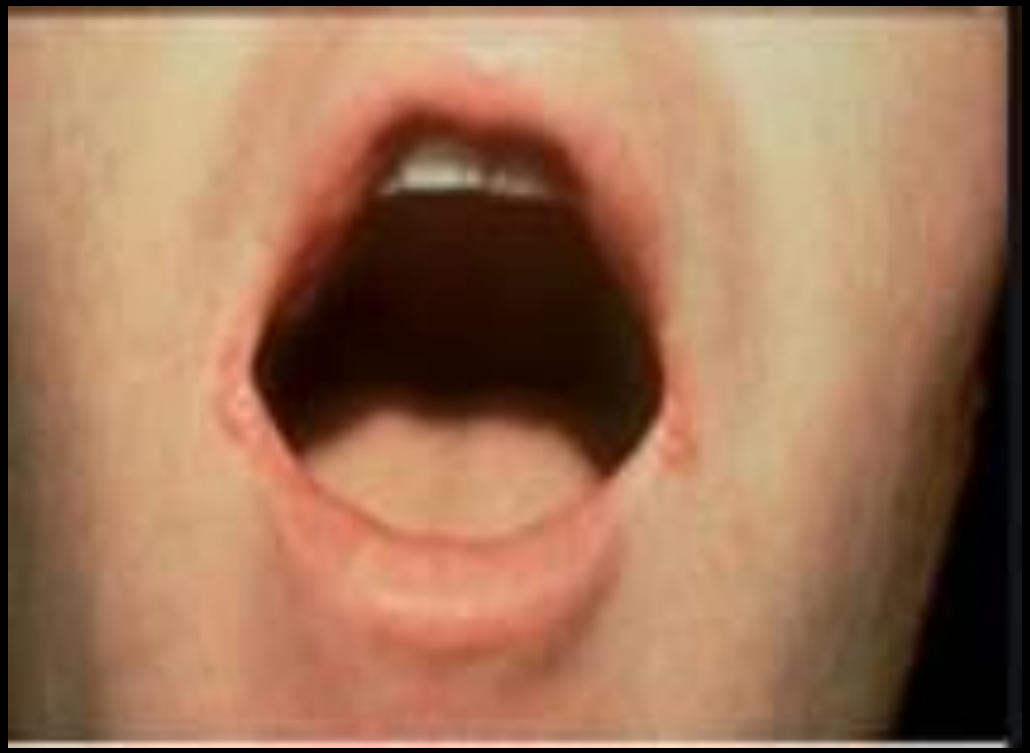
Oral manfestations(features)(signs)

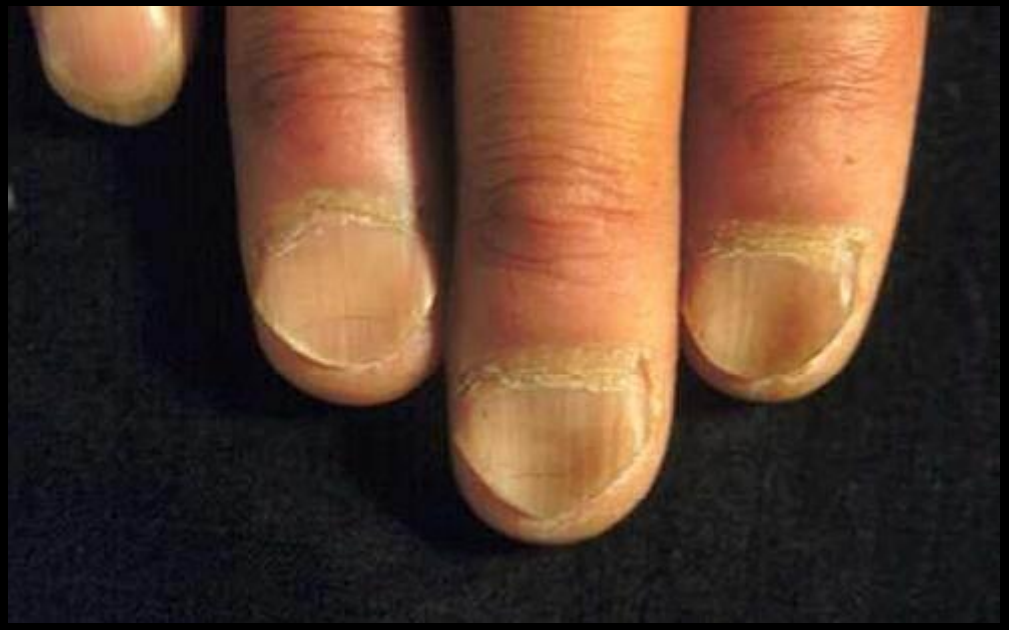
LOSSITIS



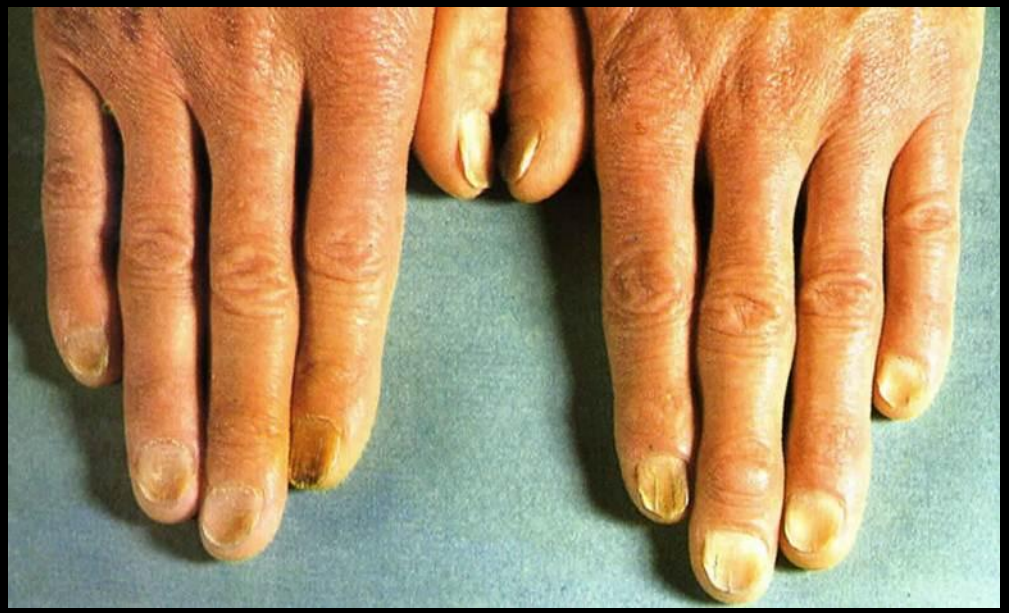
Pallor
+Angular Cheilitis








• Koilonychia-
spoon shaped nails




koilonychia

Classify anemia according to size of RBC

Anaemia

- Hb
- MCV

Microcytic	Normocytic	Macrocytic
Iron def	Acute blood loss	B12
Thalessaemia	ACD	Folate
		Hypothyroid

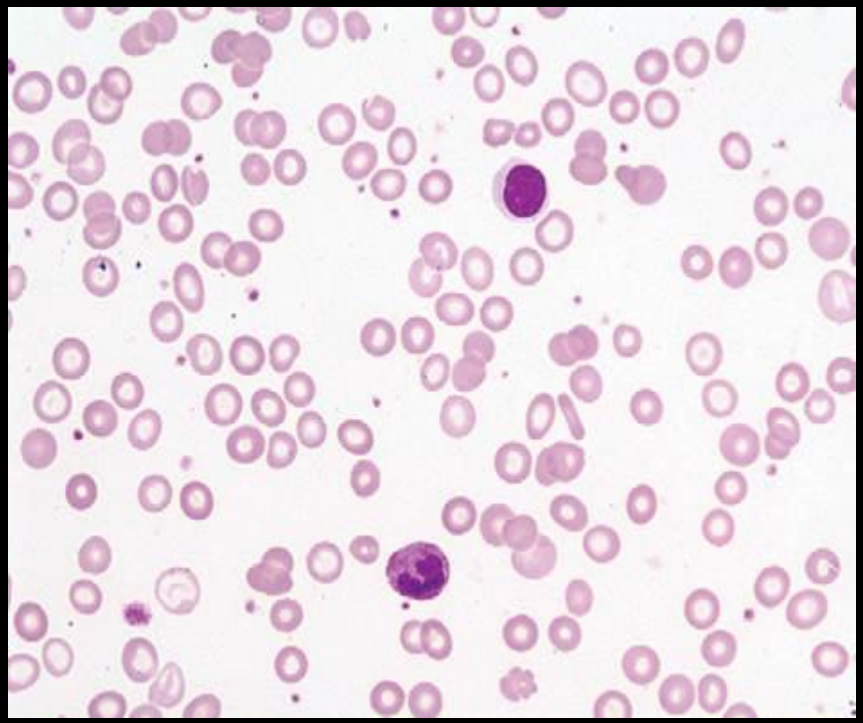
Difference between IDA iron def anemia and
ACD =anemia of ch ronic disease

IDA vs ACD

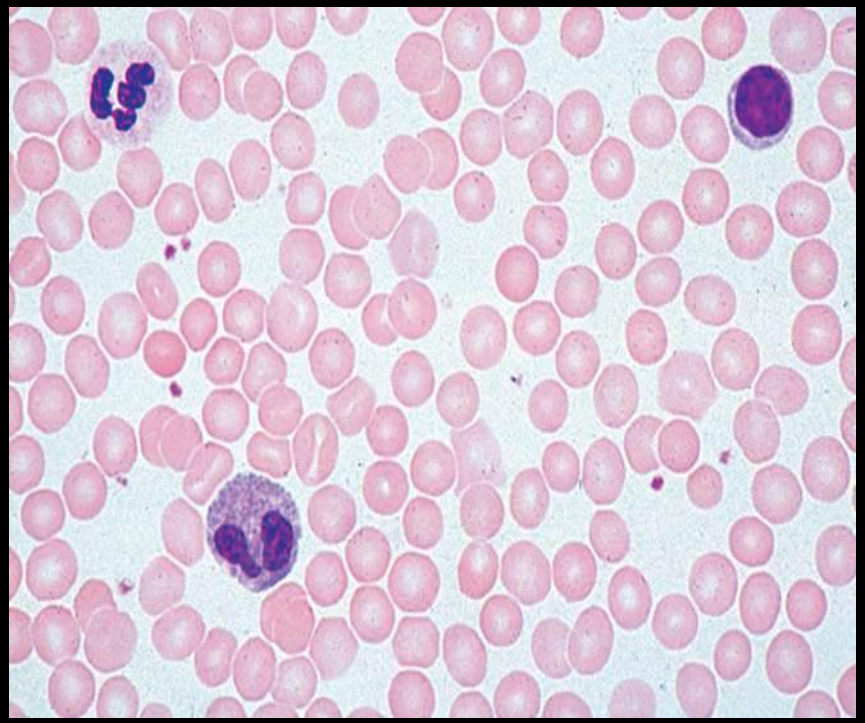
Iron parameter	IDA	ACD
Serum iron	↓	↓
TIBC	↑	↓
Serum ferritin	↓	↑

IDA

Ida



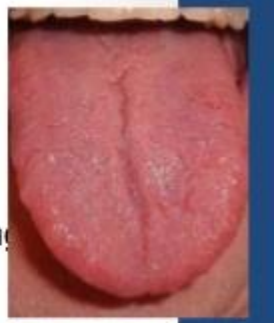
NORMAL PERIPHERAL BLOOD

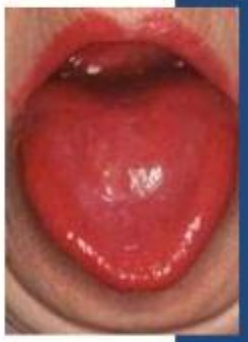


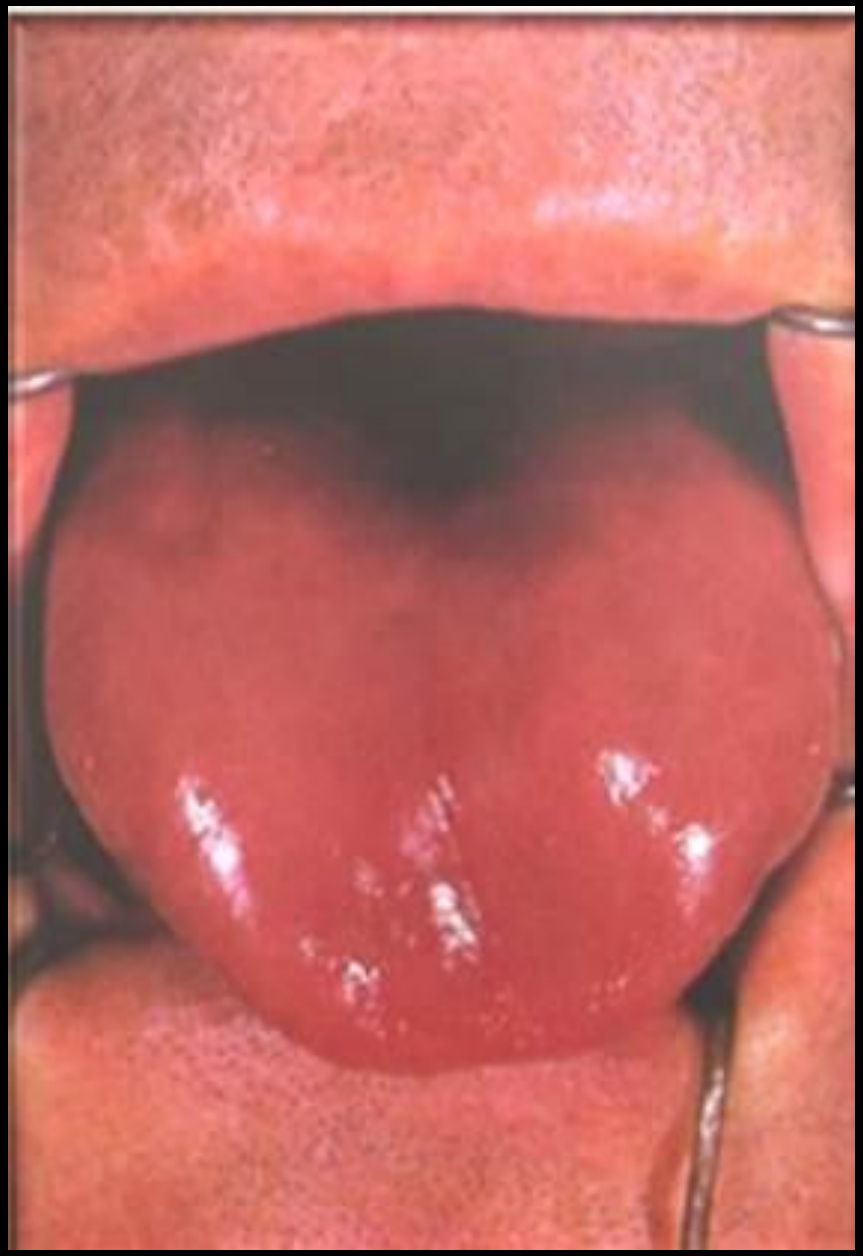
B12 def

Oral Manifestations

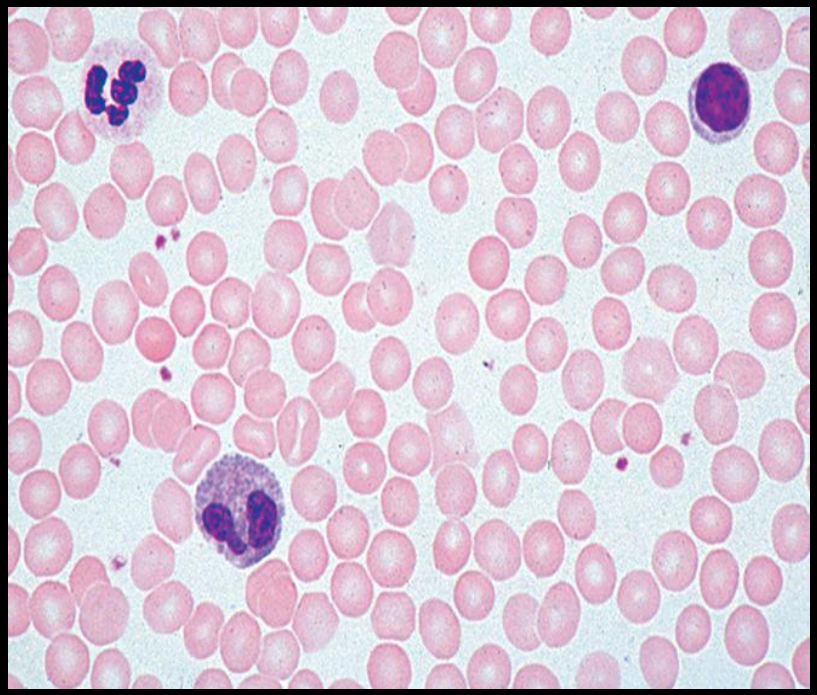
- In early deficiencies
  - Soreness of tongue without depapillation or colour chan
- In severe anaemia
  - Atrophic Glossitis is the best known effect
- Angular Stomatitis is also a well known sign



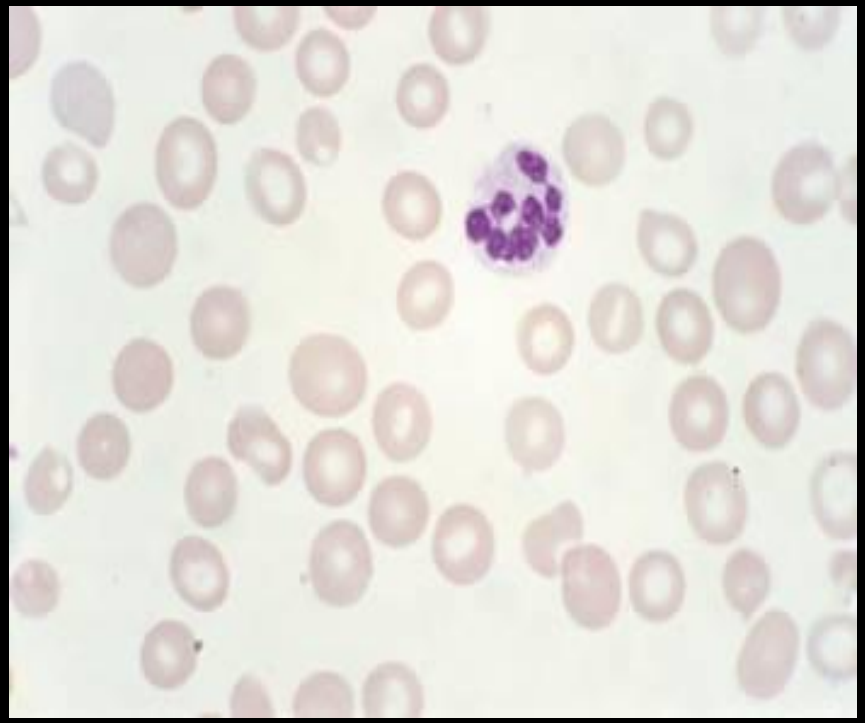




normal



B12 def



presenting complaint of wbc dis

Symptoms of abnormalities of WBC

- ❑ Increase susceptibility to infections (neutrophil count <0.5×10 ^{9}/l)
  - ➢ Life-threatening infection or apparently trivial infections (e.g. a sore throat) which is usually refractory to treatment
  - ➢ Pneumonia
  - ➢ Perianal sepsis
  - ➢ Viral infections (**Herpes zoster** & Herpes simplex)
  - ➢ Opportunistic infections e g Pneumocystis **j**irovecii pneumonia

leukocytosis

Elevated total WBC count more than 11,000 cells per cubic mm
Causes:
Infection epecialy bacterial
Inflammatory disease
Malignacy myeloproliferative leukemia

Symptoms of clotting abnormalities

- **Easy bruising**
- **Purpura**
- **Bleeding into joints (haemophilia)**
- **Thrombotic tendency.**

Localize the haemostatic defect**

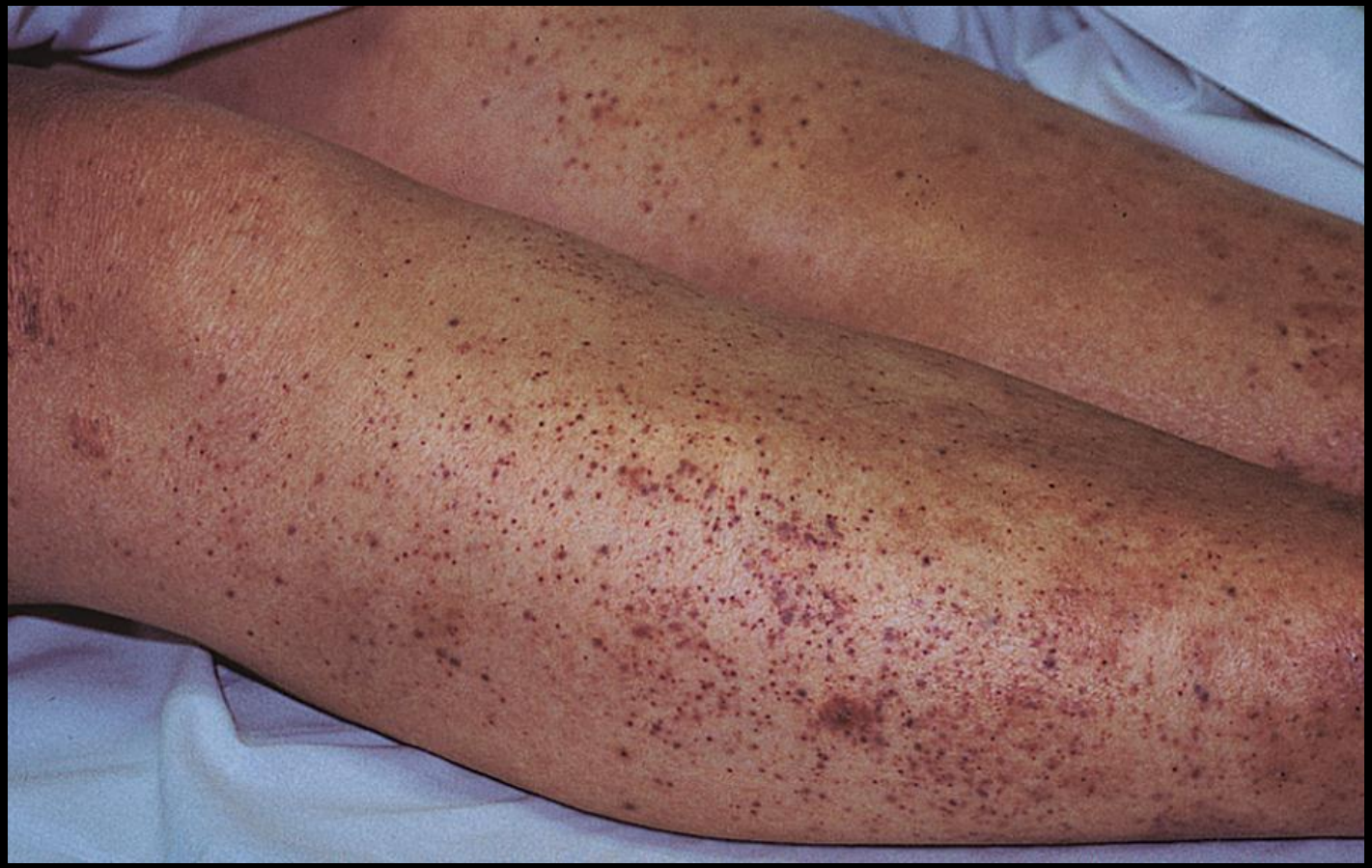
	Platelet dis	Coag.fact
Site of bl.	Skin,m.membrane	Deep in soft
Petechiae	Yes	No
Echymosis	small , superficial	Large , deep
Hemarthrosis	rare	common
Hematomas	rare	common
Bl.after cuts	early	late

History suggest low platelet count

- ❑ Symptoms attributable to a low platelet count (thrombocytopenia) or defective function with normal counts (thrombasthenia)
- ➢ Easy bruising.
- ➢ Purpura **red spots on the skin that do not blanch on applying pressure**
- ➢ Excessive bleeding after trauma
- ➢ Spontaneous bleeding from mucous membranes
- ➢ E g epistaxishemptysishematemesis melena hematochasia (<20x10³/µl)

purpura

red spots on the skin that do not blanch on applying pressure



Abnormal coagulation presenting complaint

- **Symptoms attributable to abnormal coagulation .**

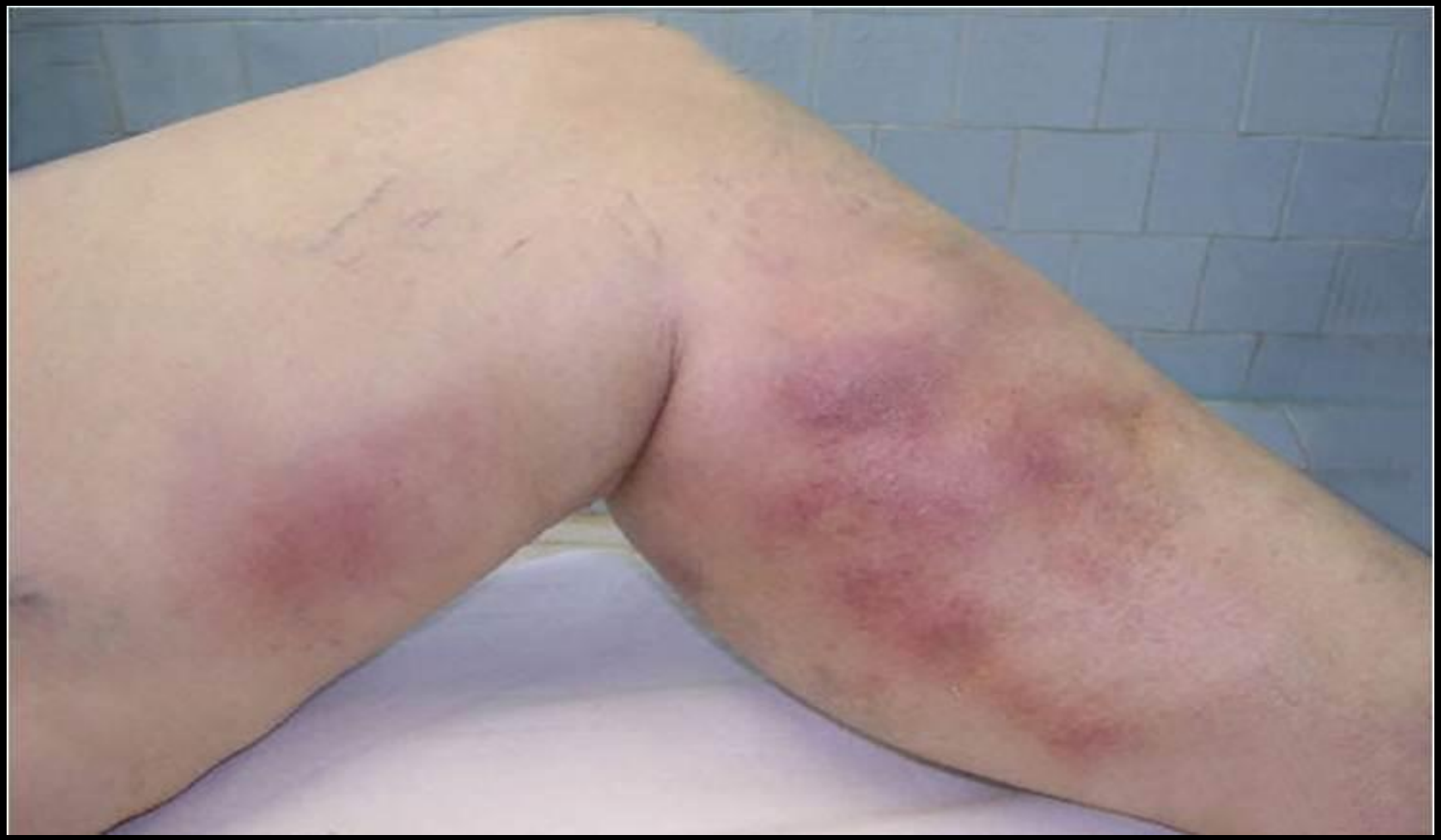
- **Low coagulation factors lead to:**

1. **Excessive bleeding after trauma**

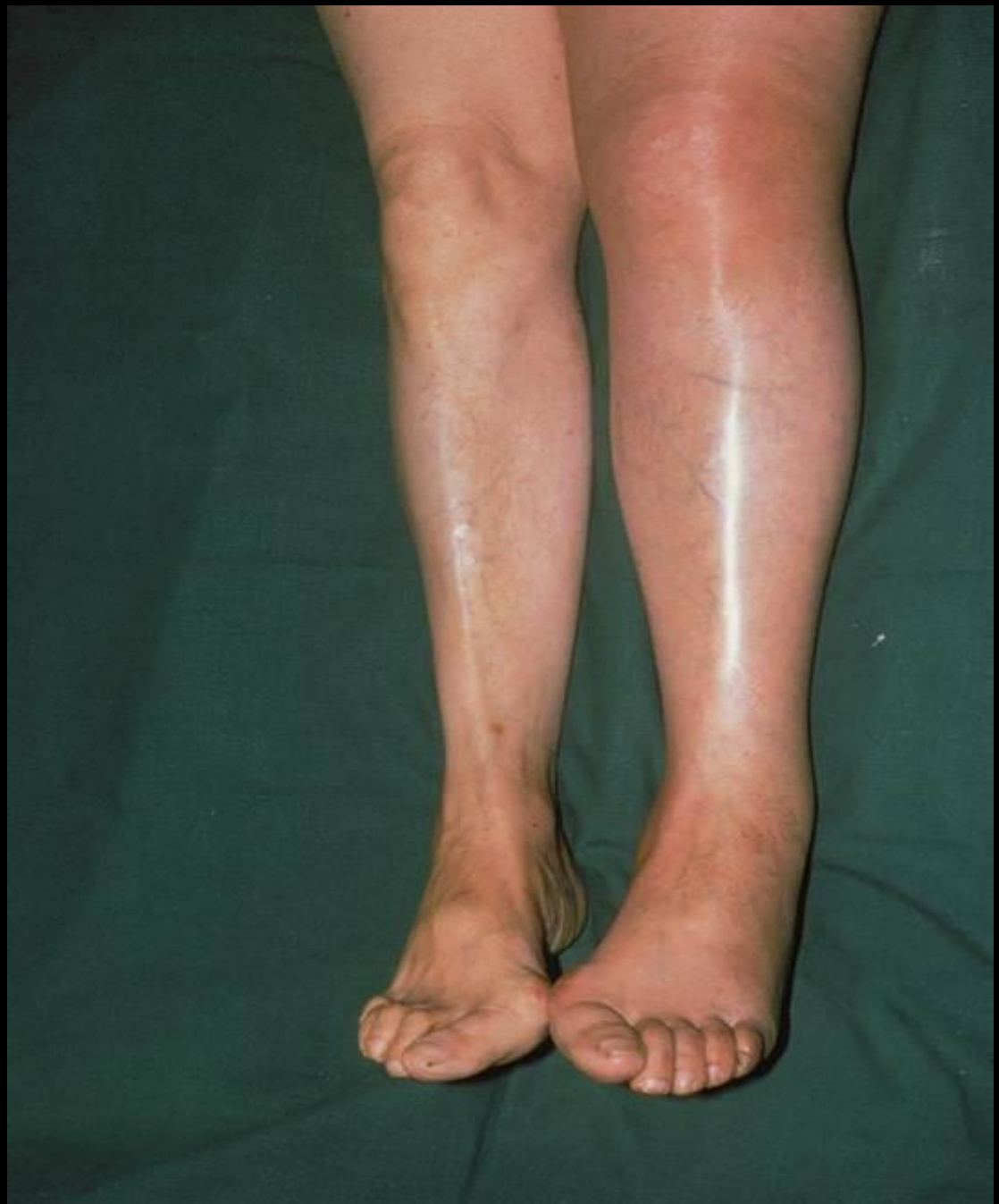
2. **Spontaneous bleeds into joints and muscles**

- The coagulation system includes several important, naturally-occurring inhibitors of clotting, which if deficient or dysfunctional, lead to the formation of a blood clot. If the clot is in the veins just under the surface of the skin it's called a **superficial thrombophlebitis**.
- If it's in the deep venous system of the extremities, the diagnosis is a **deep venous thrombosis** or "DVT".
- This results in painful swelling of the extremity (usually the leg) associated with redness and increased skin temperature.

superficial thrombophlebitis

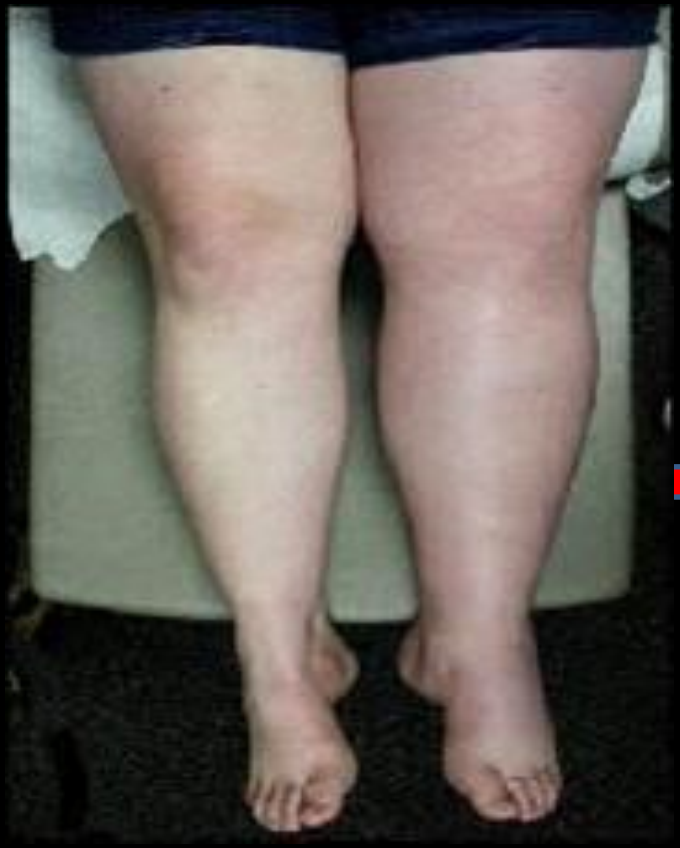


DVT

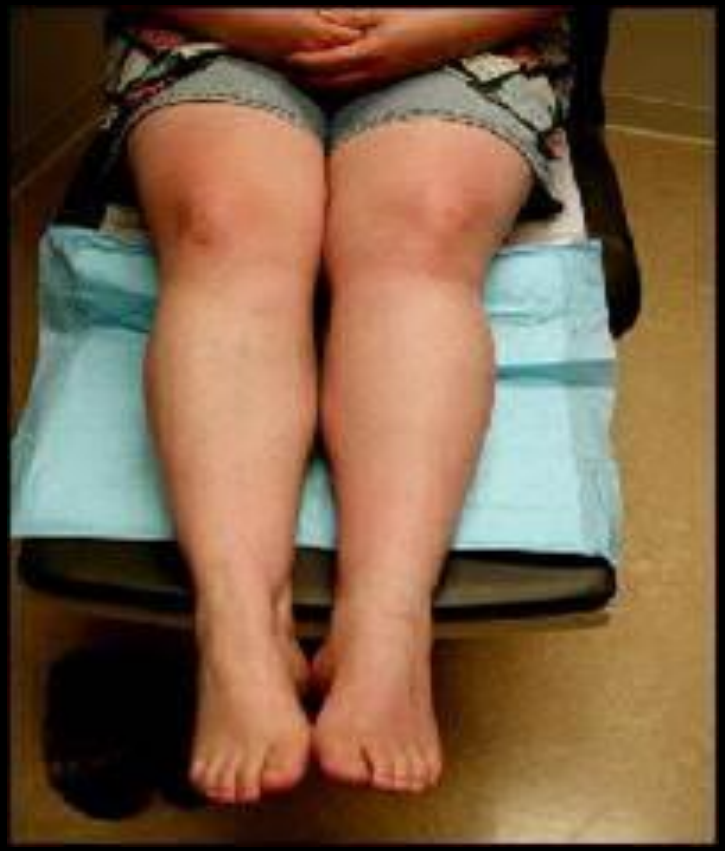


DVT

swelling of the left leg associated with MILD redness



After treatment



History of the presenting complaint

- Symptoms attributable to infiltration of bonemarrow and lymphreticual organs by malignancy
  - Lumps caused by lymphadenopathy (neck, axillae and groin)
  - bone pain (in leukemia due to bone marrow destension)
  - abdominal discomfort +- distension caused by splenomegaly)

Lymphadenopathy

- What is your compliant ? Mass felt by patient or noticed by relative?
- When it started ? (i.e. duration of the problem).
- Where and and course is it progressive, regressive or stationary.
- Is it associated with remission and relapses.
- Did you notice any associated symptoms
- Local symptoms e.g. pain, burning sensation….redness and discharge
- General symptoms e.g. fever, joint pain…rash sore throat change appatitie or weight

- Any relieving and aggravating factors ?

- Drug history. Eg antibiotics & their response.
- Past medical history.
- Simillar problem or tb.
- family member(s).

Systemic review in blood dis

- Blood abnormalities can be a manifestation of a systemic disease
  - in **IDA** look for symptoms of GIT and gynecological disease associated with blood loss.

Systemic enquiry

- Jaundice + anemia+dark color urine (hemolytic anemia)
- Gastric surgery (vitamin B_{12} deficiency)
- Dysphagia (Plummer-Vinson syndrome)associated with IDA
- Steatorrhea (malabsorption)(anemia)
- Dietary history (vegeterians).pica

magpie

Past medical history

- Previous blood tests for comparison of Hb AND wbc counts (recent onset ACUTE or long standing CHRONIC)
- In Patients presenting with easy bruising or bleeding (ask past surgical history ?was there h/o excessive bleeding)

Drug history

Hematological abnormality	drugs
Marrow aplasia	chemo (dose-related)
Leucopenia agranulocytosis	Carbimazole
Thrombocytopenia	Thiazide diuretics

Family history

Red cell disorders	
Disorders of the membrane	Hereditary spherocytosis
Disorders of hemoglobin	Thalassemias and sickle syndromes
Disorders of metabolism	E g G6PD deficiencies

Coagulation disorders	
Factor deficiency	Hemophilia A, B & C
Combined factor and platelet abnormality	Von Willebrand's disease
Platelet abnormality	Bernard-Soulier syndrome Glanzmann's thrombasthenia
White cell disorders	Chronic granulomatous disease

History of patient with anemia***

What symptoms have you had fatigue, Tiredness, dyspnea, palpitation, headache, dizziness, tinnitus, lack of concentration. sore tongue or angle of mouth,dysphagia and chest pain (due to exacerbation of angina pectoris)

Any associated symptoms = blood loss(nose git upper and lower genitourinary e g heavy periods) fever lymphedenopathy abdominal pain ordiarrhea steatorrhea bone pain jaundice and dark urine

Joint pain cold intolerence.

Past simillar .h/o blood transfusion.any chronic illnesses.pud colitis or stomach surgery or any recent surgery Have you had problems with your kidneys or a chronic severe arthritis?(Anaemia of chronic disease) any recurrent infections)hypothyroidism

Diatery history vegans pica

Drug history ?chemo

Family /h Anemia in the family any type

General physical examination

Examination of patient with anemia

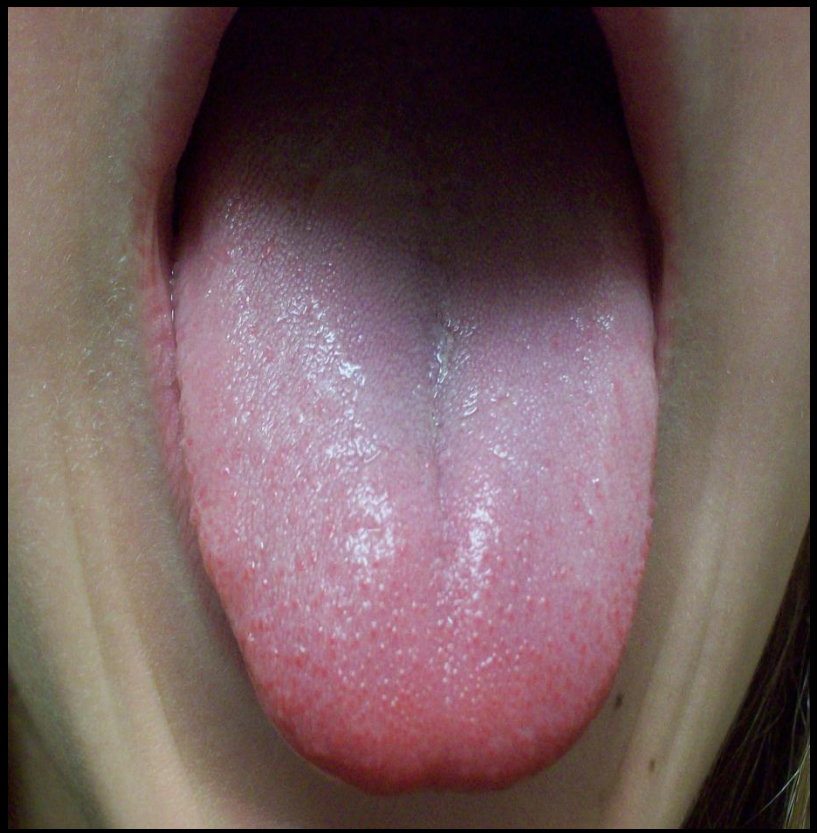
- Look for
- Pallor skin and mucous membranes,glossitis angular stomatitis mouth ulcers purpura jaundice lymphadenopathy rash

- Palmar creases clubbing koilonychyia
- Abdomen for masses organomegaly.

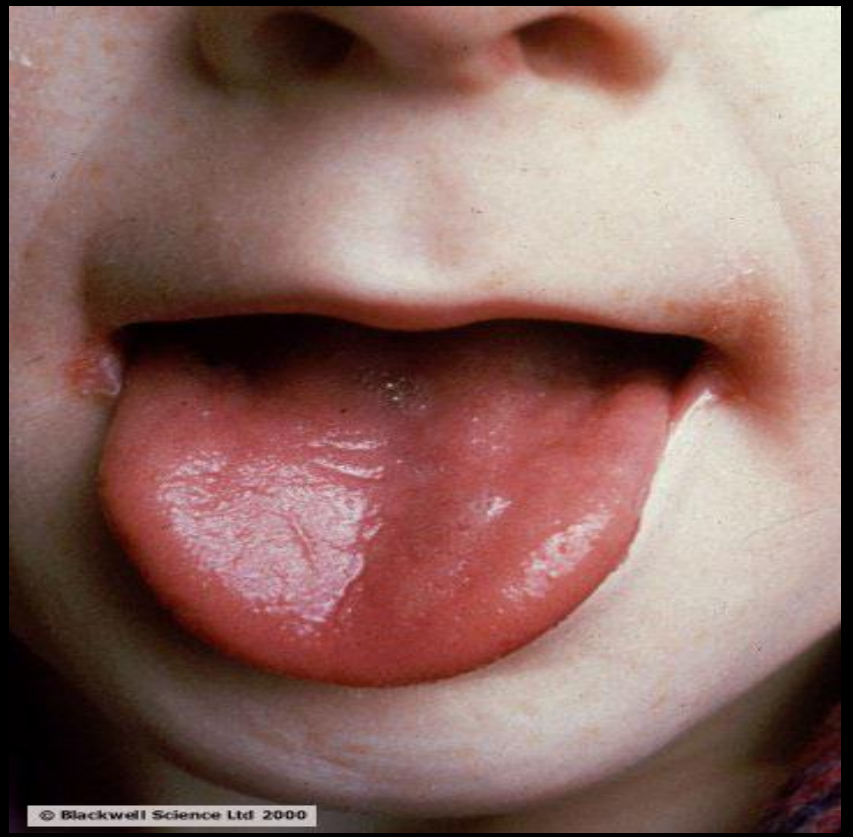
Clinical sign	Possible hematological abnormality
Face: Pallor Jaundice Plethora	 Any anemia Hemolytic anemia Polycythenia
Mouth: Ulcers Glossitis Angular stomatitis Candida (thrush) Bleeding gums Gingival hyperplasia	 Neutropenia Megaloblastic anemia Iron deficiency anemia Iron deficiency anemia Immunosuppression Thrombocytopenia Acute myeloblastic leukemia(AML)

glossitis :
swollen , red , and smooth surface tongue.

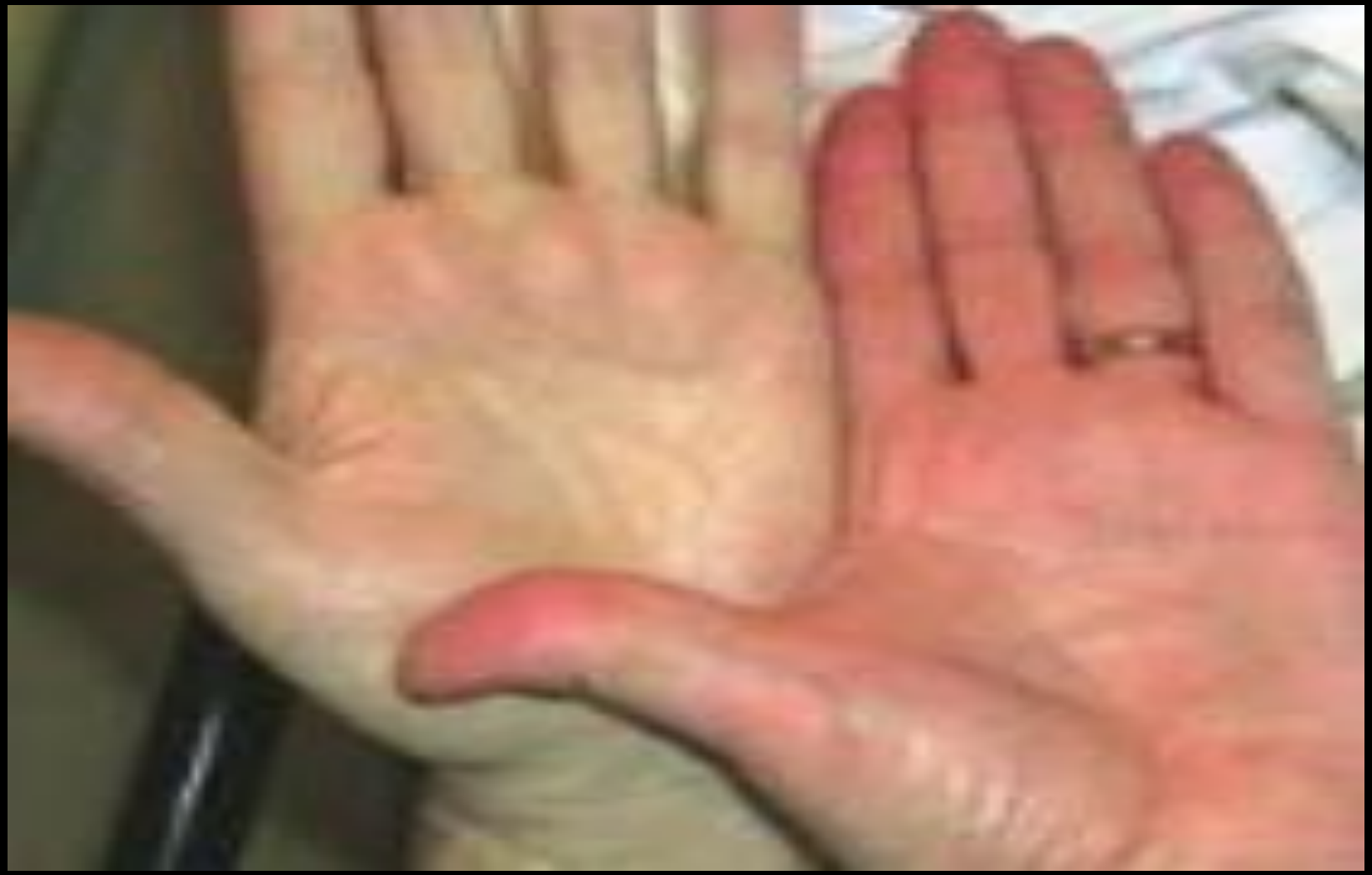
Normal tongue



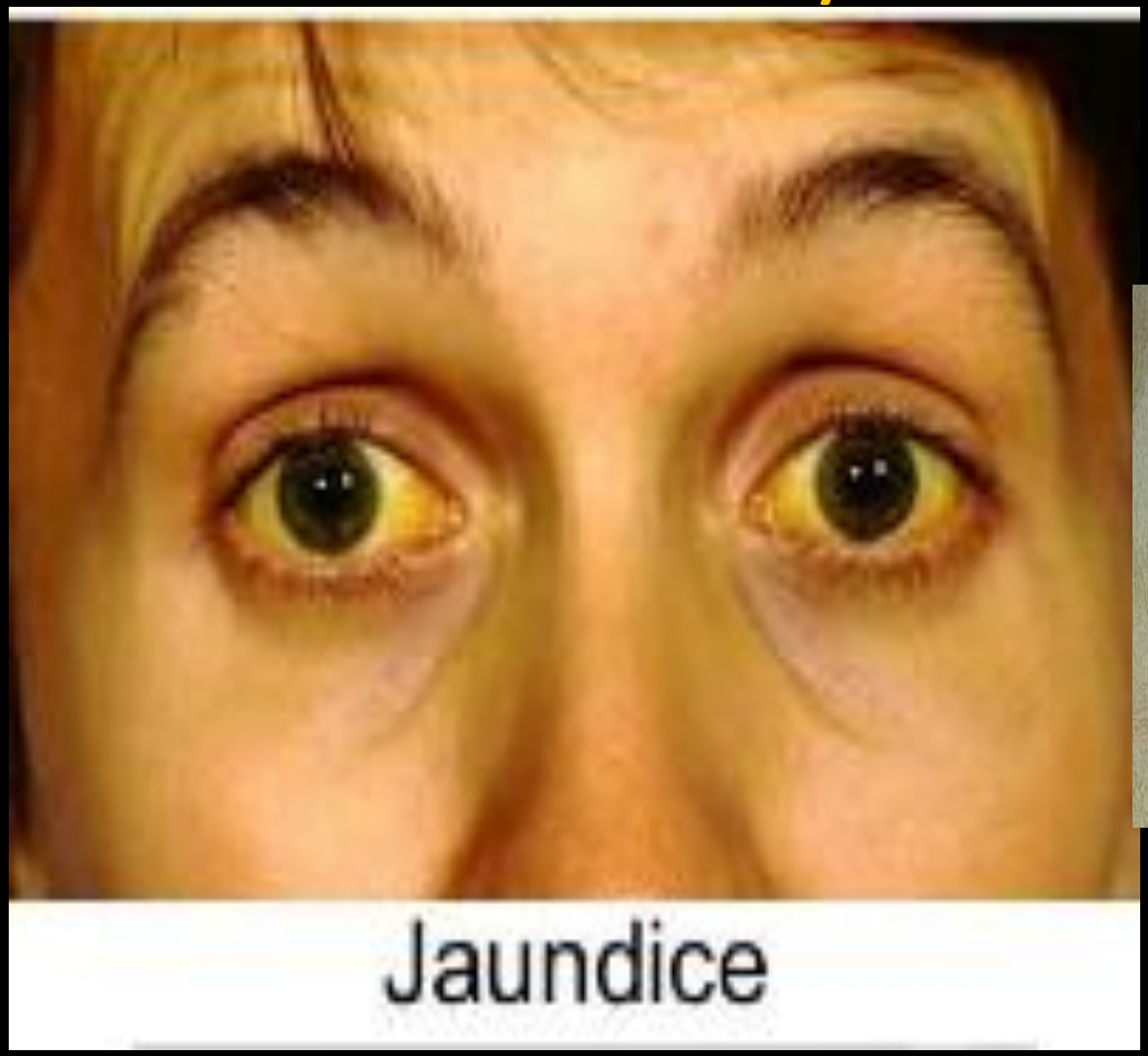
glossitis

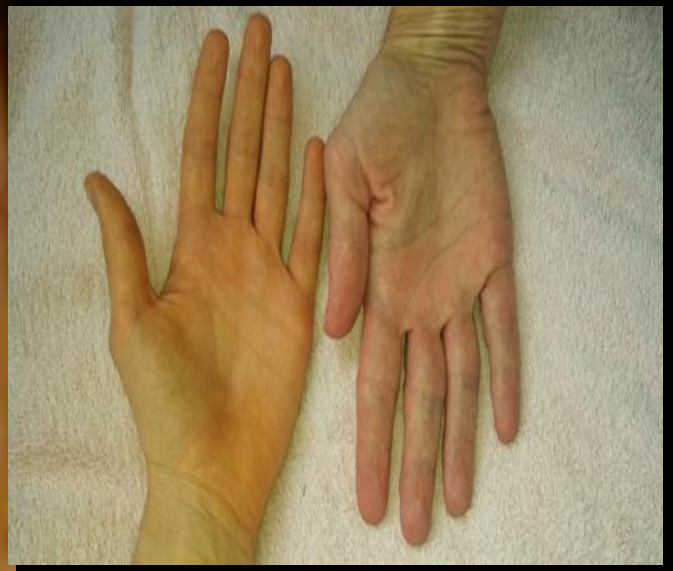


pallor

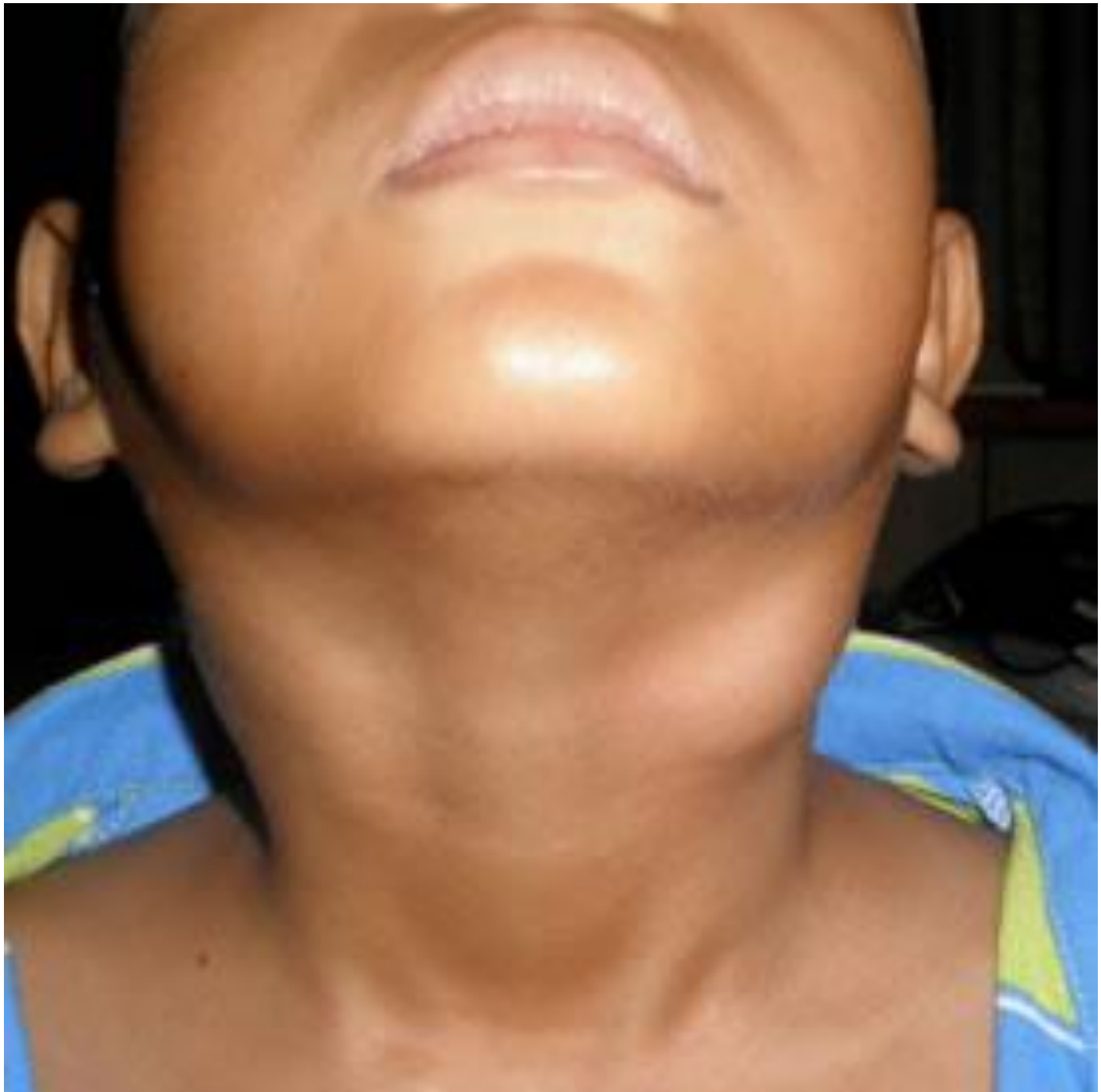


One of the causes of Pallor and jaundice is hemolytic anemia





Clinical sign	Possible hematological abnormality
Skin: Pallor Jaundice Excessive bruising Purpura/petechial rash Leg ulcers	 Any anemia Hemolytic anemia Hemostatic failure (platelets or coagulation disorders Thrombocytopenia Hemolytic anemia (sickle cell anemia)
Anal region: Infection, ulceration, abscesses	 Leucopenia



Lymphadenopathy:

- ❑ chick the following character why?
- ✓ Site
- ✓ Size
- ✓ Number
- ✓ Consistency (soft, firm, hard or rubbery)
- ✓ Tenderness (infection > malignancy)
- ✓ Fixed or mobile
- ✓ Discrete or confluent (matted)
- ✓ State of skin near by

Lymphadenopathy:

- Note the followings

- ✓ Examine the area drained by the enlarged group of LN
- ✓ Tender cervical LN plus sore throat (IMN)
- ✓ Progressive and painless (lymphoma and CLL)
- ✓ Fever, weight loss, anorexia and sweating (TB, leukemia and lymphoma)
- ✓ Pruritus (lymphoma)
- ✓ Pain at site after alcohol intake (lymphoma)
- ✓ Jaundice (AIHA, malaria, liver infiltration)
- ✓ Petechiae (leukemia and lymphoma)
- ✓ Skin rash: vasculitis (CTD: SLE, RA), erythema nodosum,
- ✓ Parotid enlargement .

Lymphadenopathy:

Common causes

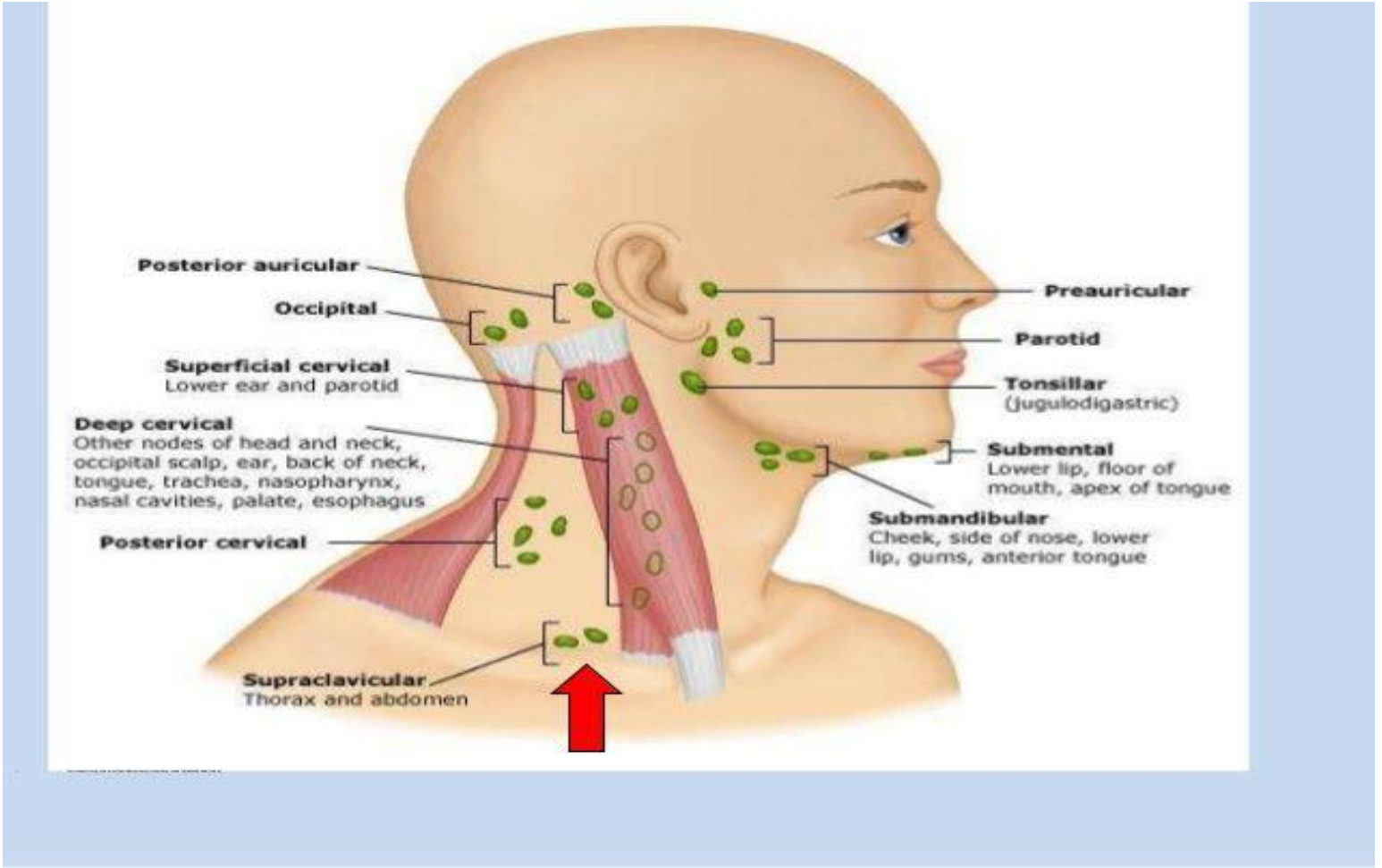
Localized

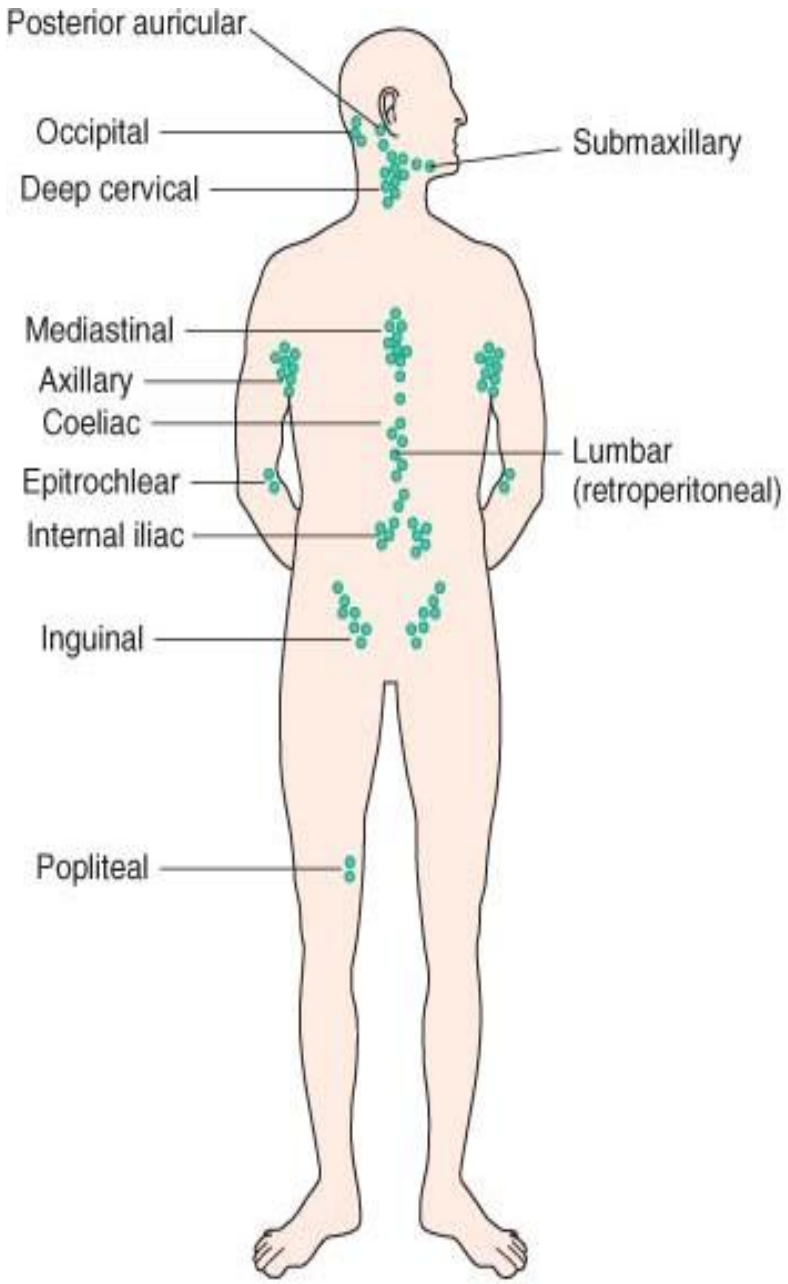
- ✓Local bacterial or viral infection
- ✓Lymphoma
- ✓Metastatic malignancy

Generalized

- ✓Systemic infection
  - •Bacterial (tuberculosis)
  - •Spirochetal (syphilis)
  - •Viral (EBV & HIV)
  - •Parasitic (toxoplasmosis, malaria, trypanosomiasis)
  - •Fungal (histoplasmosis, cryptococcosis, aspergillosis)
  - •Postvaccination – measles, DPT, salk vaccine, typhoid fever
- ✓Leukemia & Lymphoma
- ✓Inflammatory disease (Connective tissue dis: SLE & RhA)
- ✓Infiltrative (sarcoidosis)
- ✓Disseminated malignancy

Cervical Lymph nodes c




Posterior auricular
Occipital
Deep cervical
Submaxillary
Mediastinal
Axillary
Coeliac
Epitrochlear
Internal iliac
Lumbar
(retroperitoneal)
Inguinal
Popliteal

Systemic examination

- Abdomen
- Chest
- Cardiovascular
- Central nervous system

Splenomegaly

Degree of enlargement	Centimeters palpable below costal margin	Causes
Slight	0-4	Various acute and chronic infections
Moderate	4-8	Hemolytic anemia Infectious mononucleosis Portal hypertension
Massive	Greater than 8	Myelofibrosis Chronic myeloid leukemia Primary polycythemia Lymphoma, malaria leishmania

Hepatosplenomegaly

- Signs of chronic liver disease present: (spider naevi, jaundice, gynecomastia, testicular atrophy, palmar erythema, dupuytren's contracture)
  - Ascitis (advanced cirrhosis ± hepatoma)
  - No ascitis (stable CLD-PBC, IHC & CAH)

- Signs of chronic liver disease absent:
  - Lymphadenopathy present (lymphoproliferative disorders – CLL, Lymphoma-HL/NHL)
  - Lymphadenopathy absent (myeloproliferative disorders – MF, CML, ET & PRV)

Investigations

- Full blood count (Hb, WBCand diff count , Plt.) and ESR(cbc and esr).
- Peripheral blood film PBF →red cell morphology , abnormal cells (atypical or blasts), reticulocytes, parasites.
- Clotting and bleeding profiles.

Investigations

- RFT and LFT
- S. calcium, ALP, uric acid(all may increase in hematological malignancies WHY?
- S. albumin, globulin (GLOBULIN increase in MM)
- S.immunoglobulins (increase in MM)
- Serum protein electrophoresis SPE(increase iin MM)
- Urine for BENCE JOHNS protein IS postive in multiple myeloma MM

Investigations

- Chest X-ray
- USS of abdomen
- CT scan of chest, abdomen and pelvis

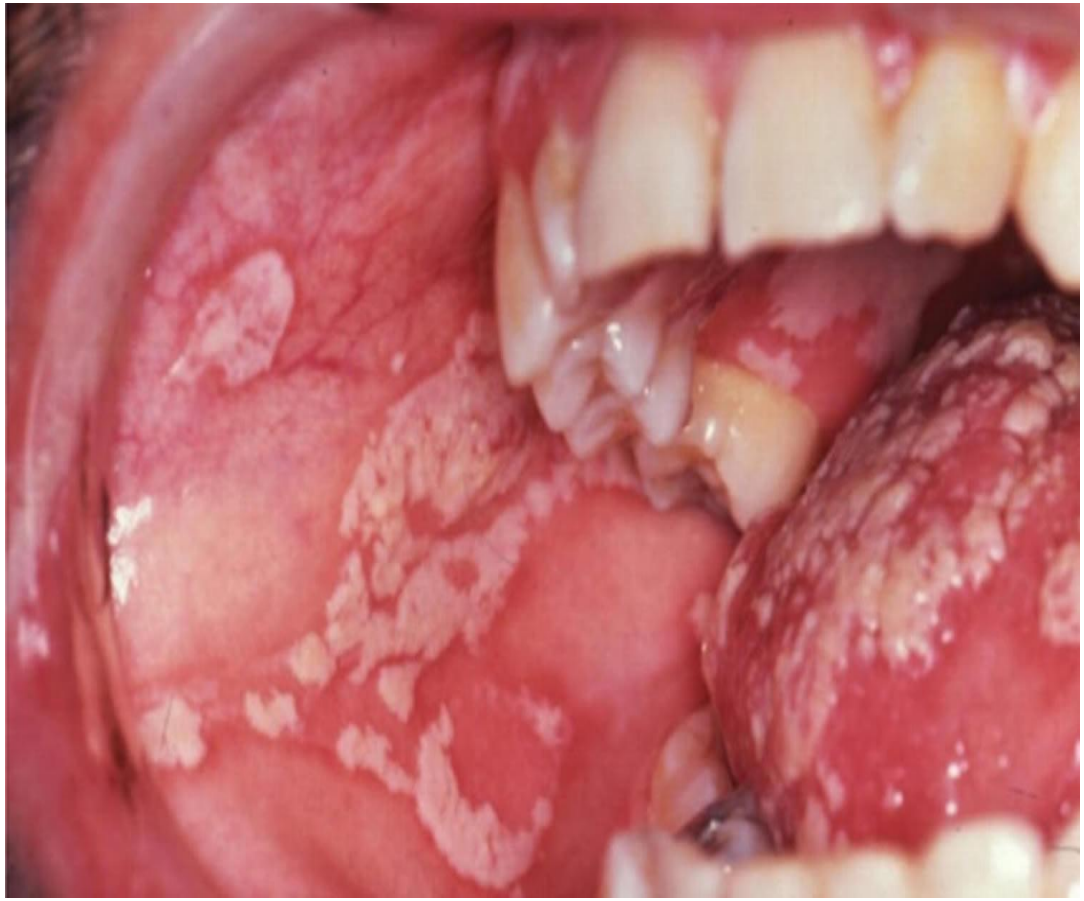
Investigations

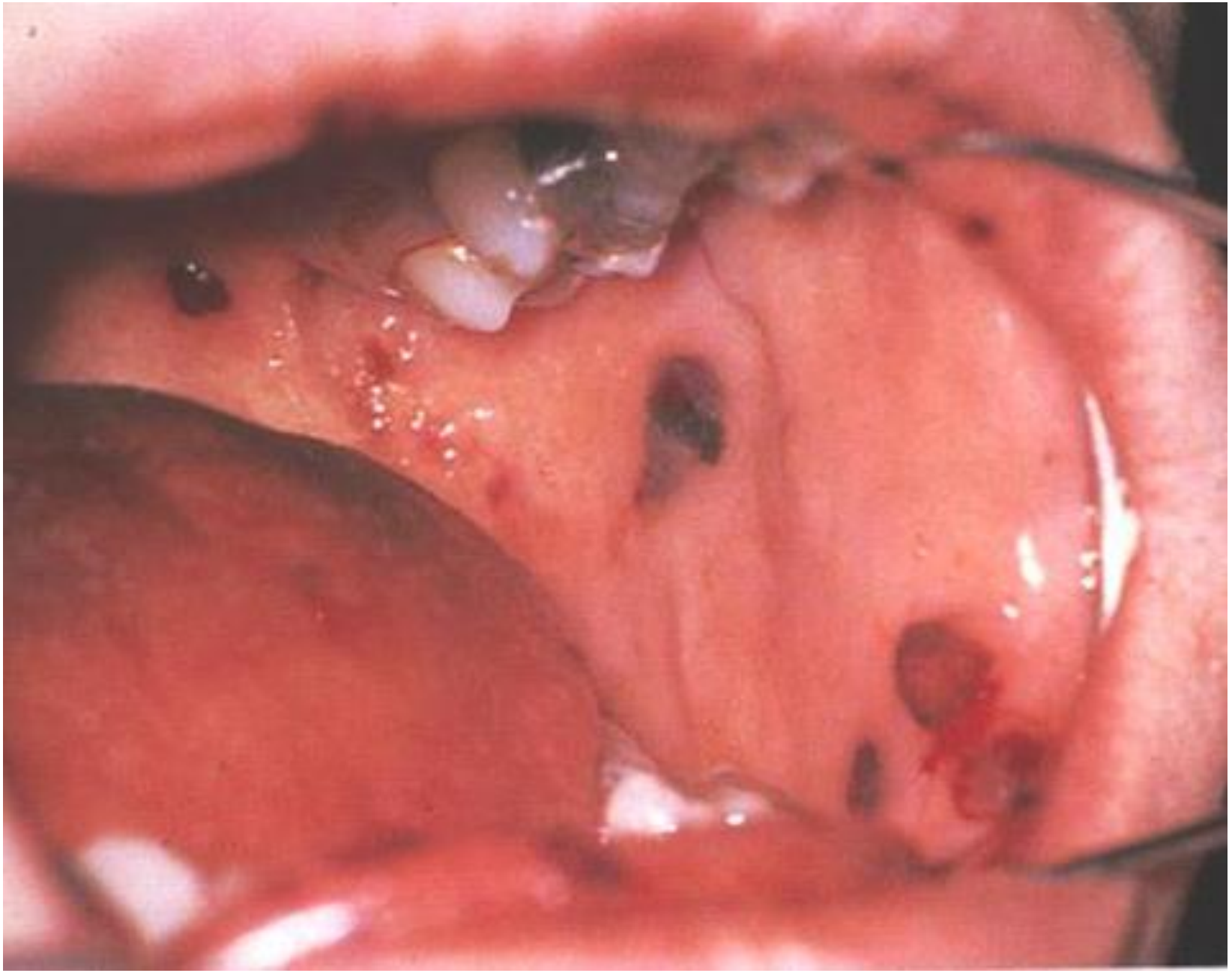
- LN aspiration and culture.
- LN biopsy for histopathology.
- Bone marrow aspiration and biopsy.

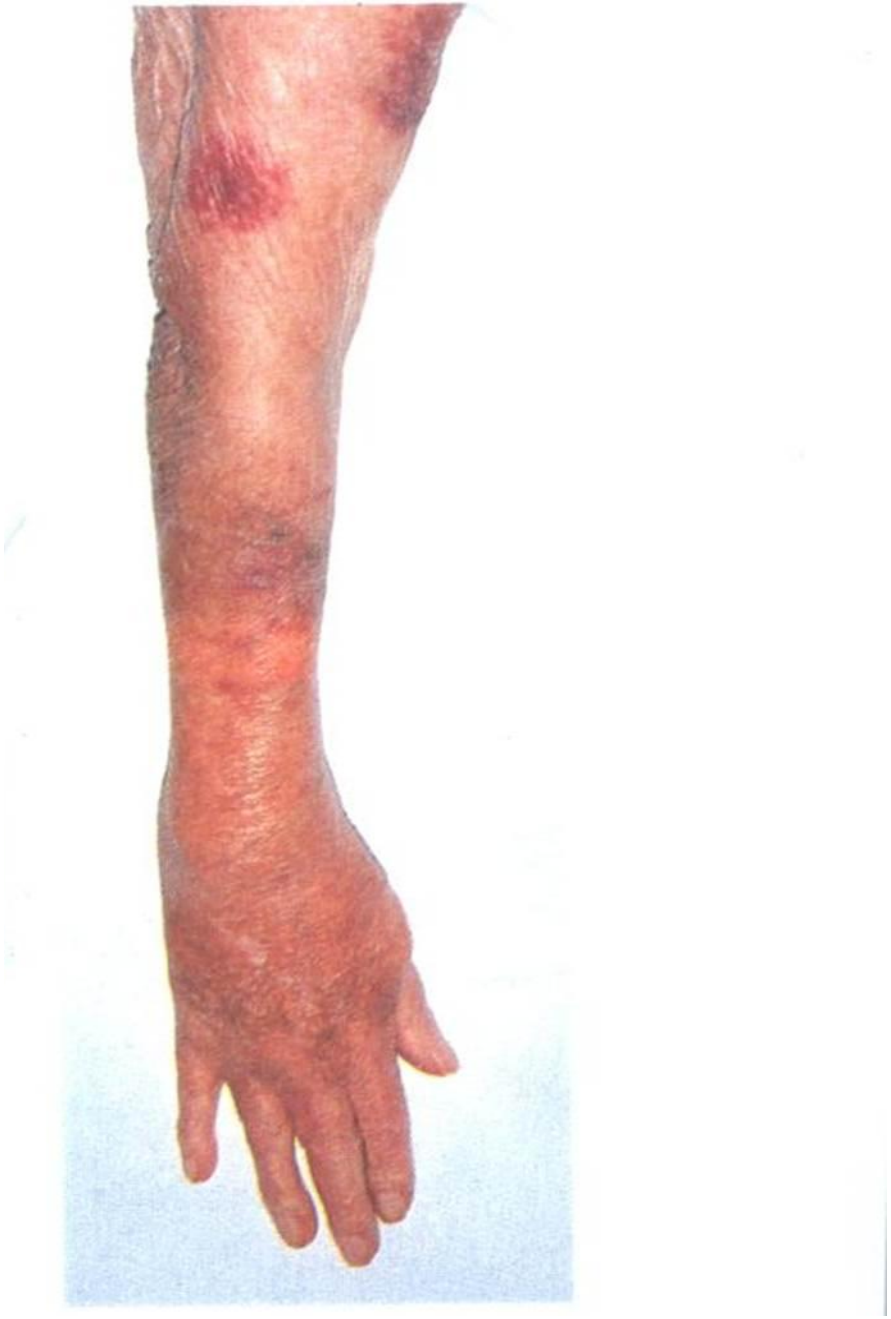
Oral thrush caused by Candida albicans

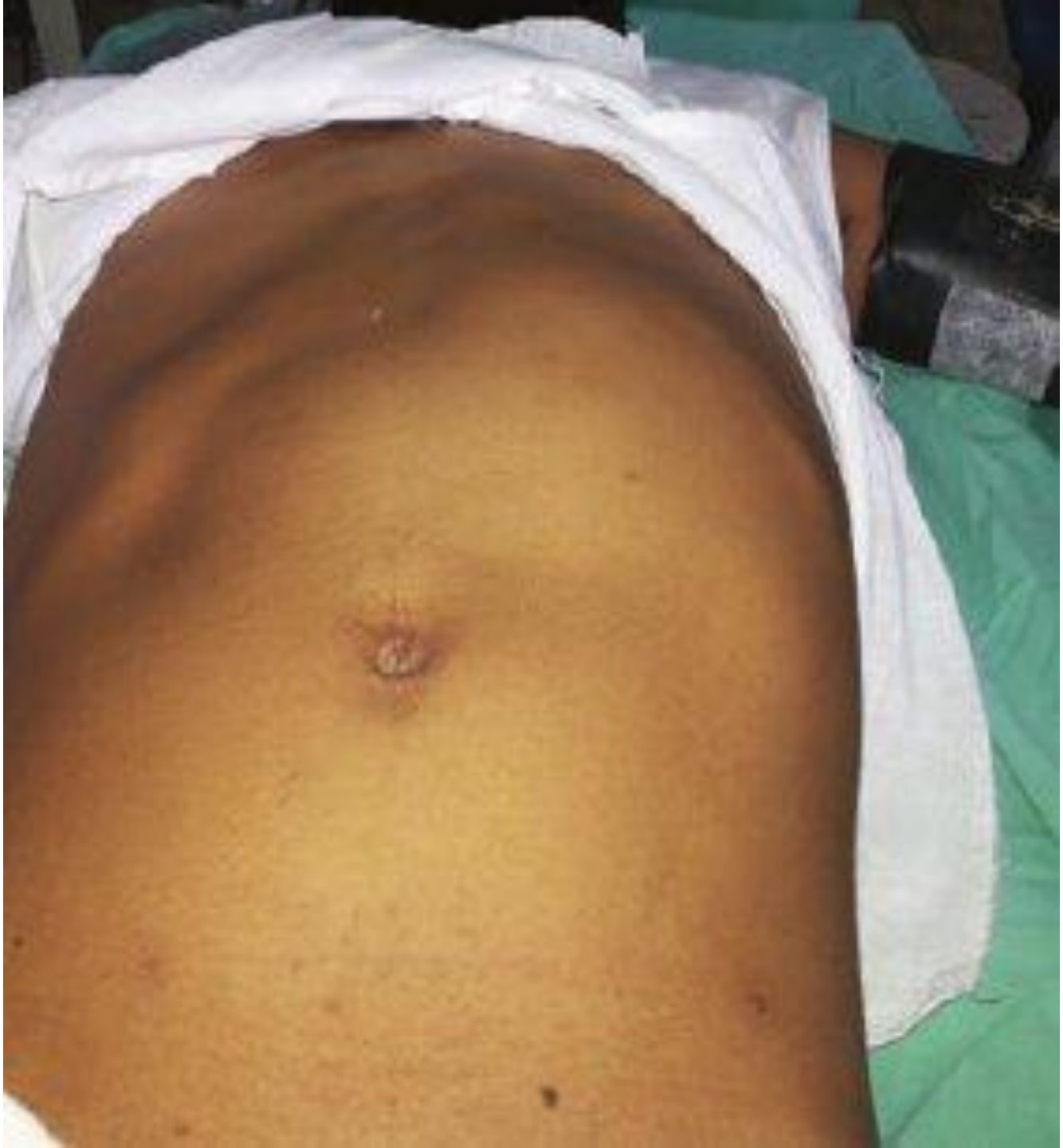
Predisposing conditions

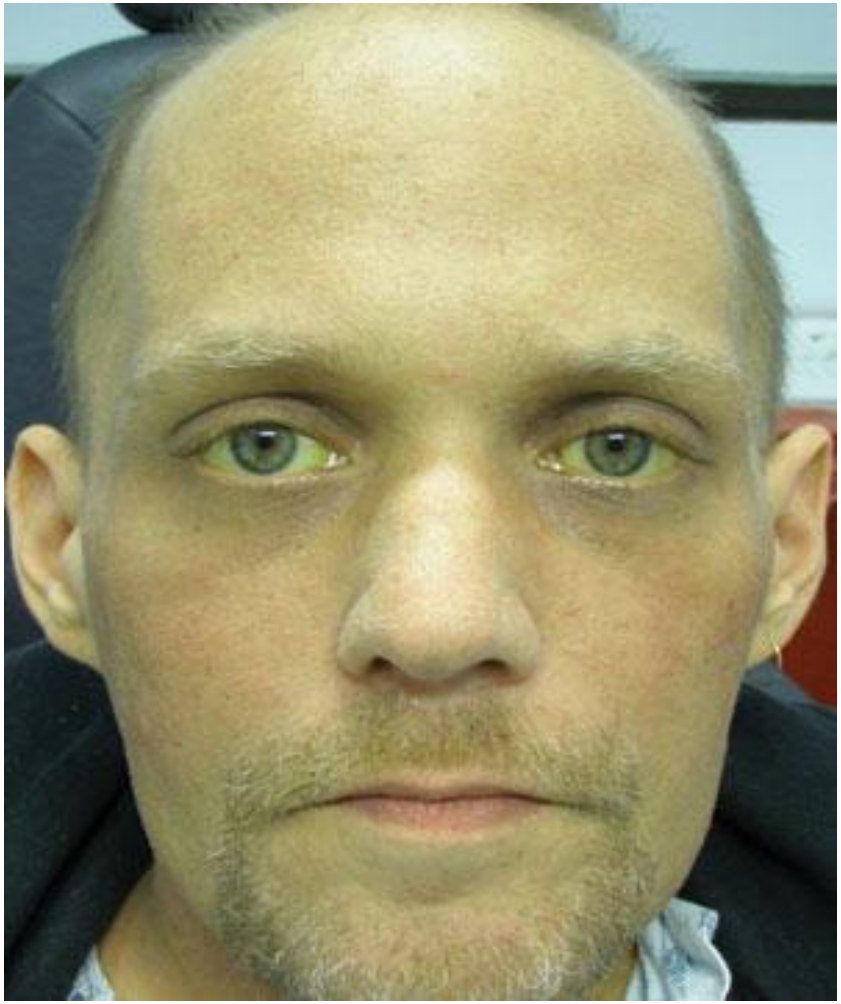
1. DM
2. Post antibiotics steroids
3. LOW wbc
4. Malignancy
5. HIV

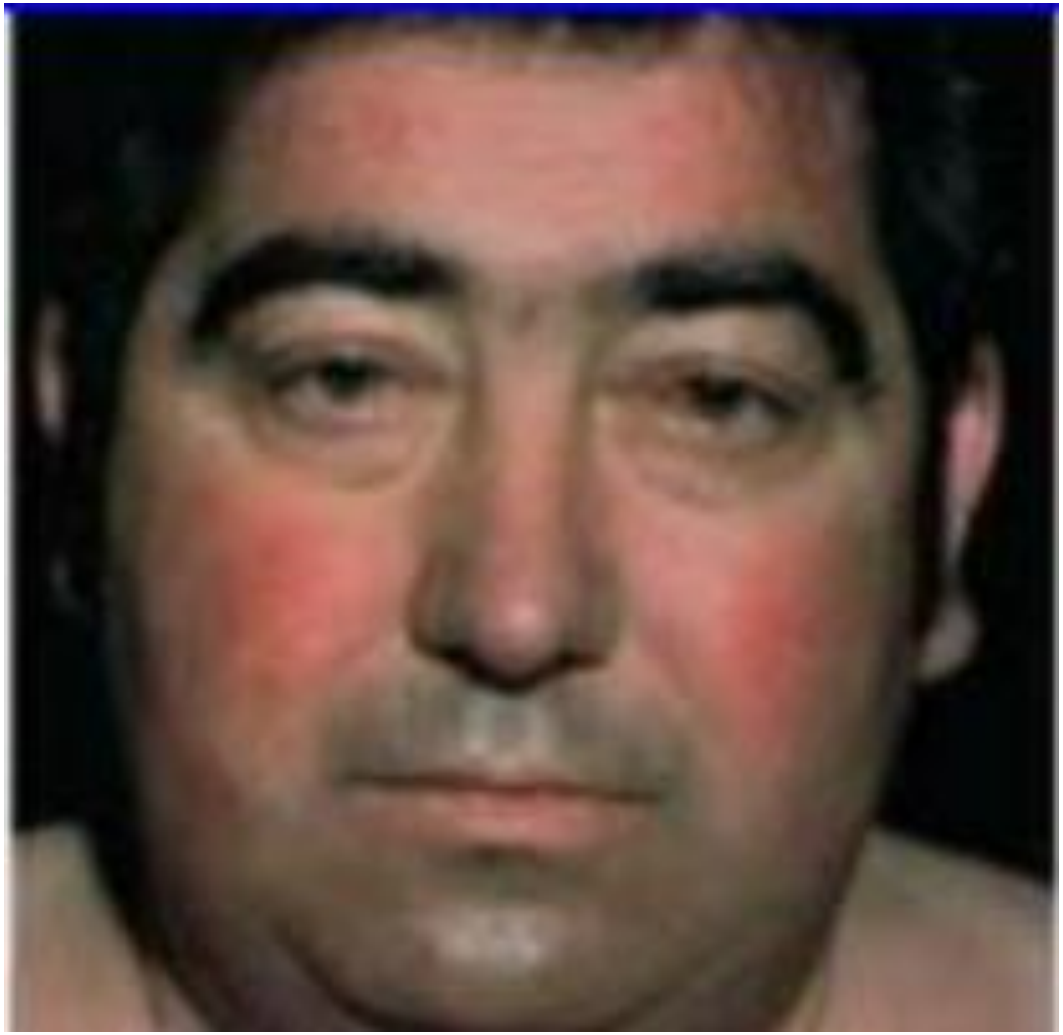


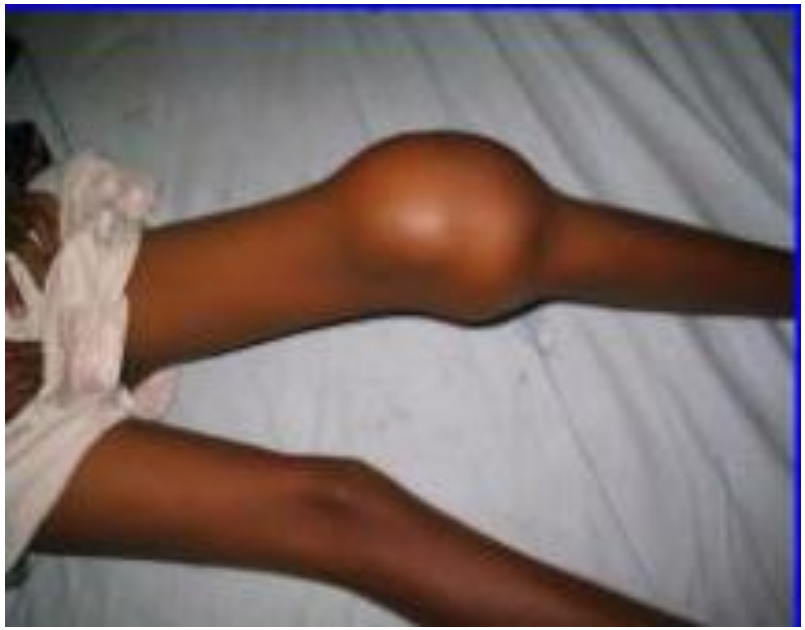


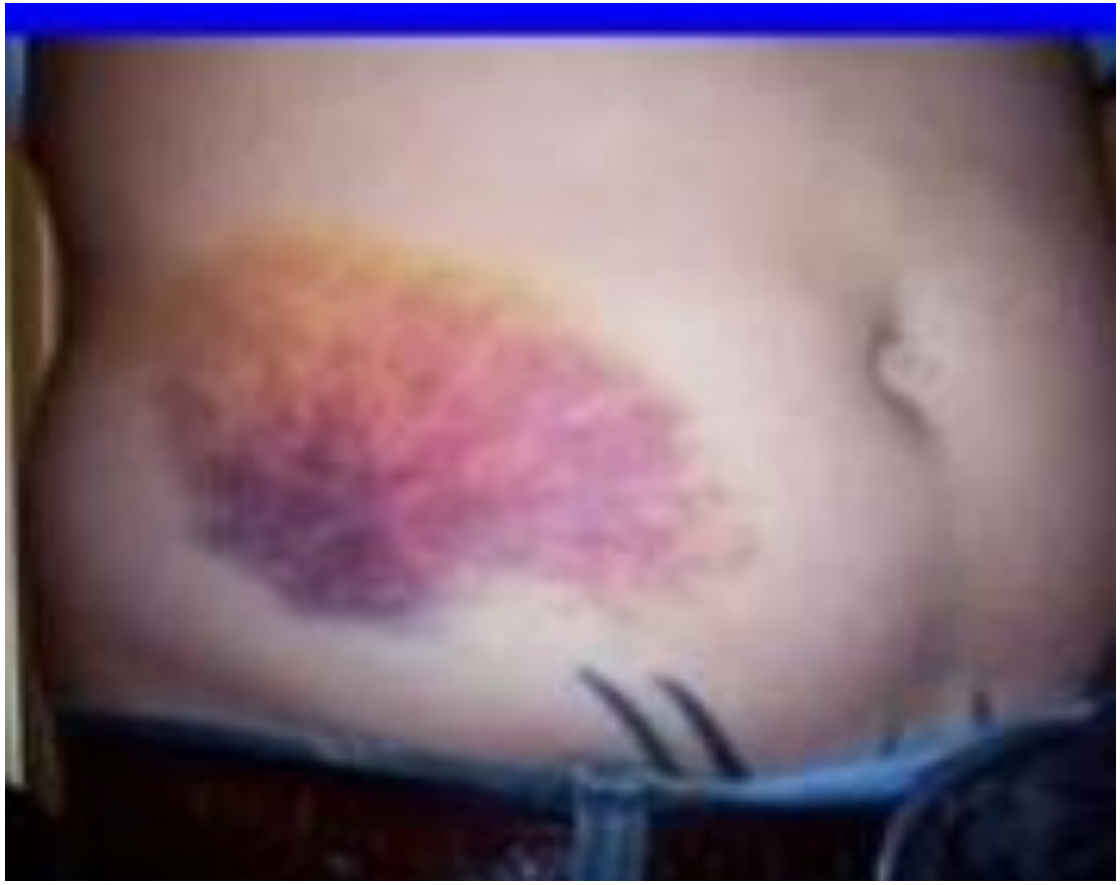












57 yr old man complains of back pain for several months and fracture of his L leg 2 days ago.

Lab and Xrays

Physical findings

Likely diagnosis