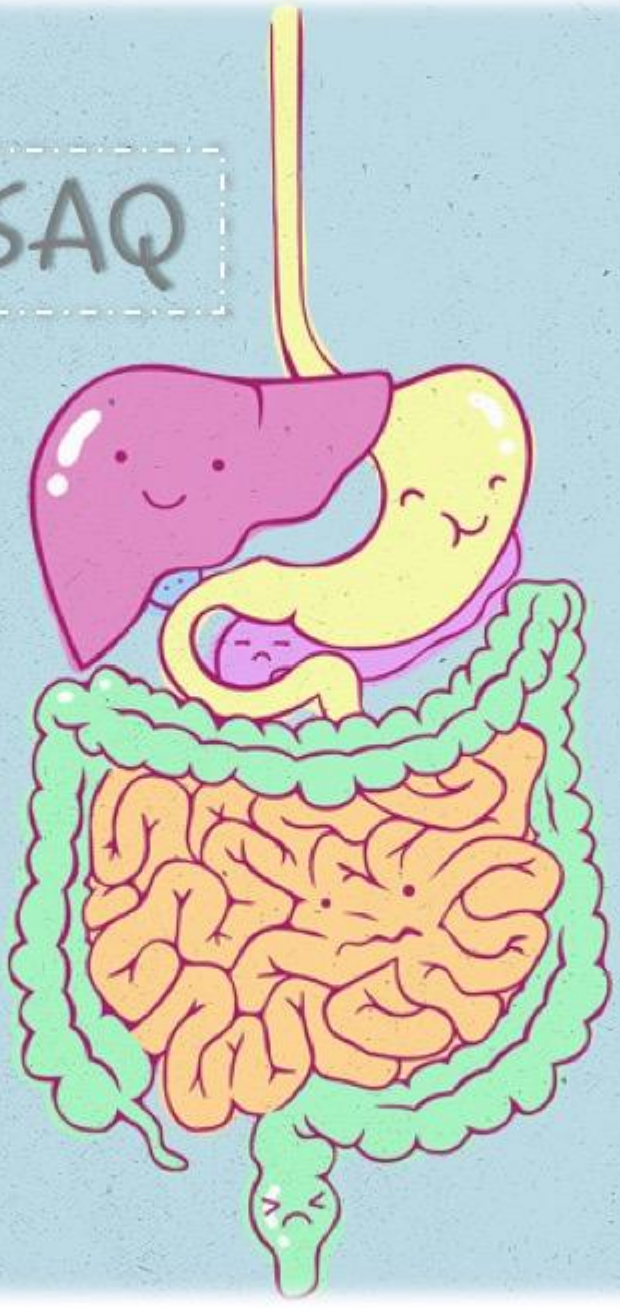
GIT SAQ



Haematology

Editing File

Anemia

A 35 year old woman is seen for easy fatigue for many months. She is now 24 weeks pregnant with her 3rd child in 3 years. She does not see any obstetrician and does not take any vitamins. Lately, she has developed a taste for eating ice. She has no other complaint. Family and past history are negative. She does not smoke or drink. Physical examination is positive for paleness of skin and, mild spooning of nails. Labs investigation is shown below :

(CBC) Hg= 7.1 gm/dl, Hct 23% (MCV) is 74 fl (normal 85-95 fl).	WBC=5,400/mm3 (differential normal)	platelets 450,000 /mm3	Low stores of iron.

What is the most likely diagnosis? Iron deficiency anemia.

What is the expected shape and size of RBCs under the microscope?
Microcytic hypochromic anemia with anisocytosis and poikilocytosis.

Mention the storage forms of iron? Ferritin and Haemosiderin.

Describe briefly how is iron absorbed in the body?
Iron from ingested food reaches the duodenum in the form Fe^{3+} (ferric) it's then transformed by *ferrireductase* to Fe^{2+} (ferrous.) After that it reaches the bloodstream via a iron-regulated transporter called ferroportin. In the bloodstream it's converted back to Fe^{3+} form by ferroxidase and binds to transferrin to be transported to various tissues.

Mention some factors that favor iron absorption?
1-Heam iron. 2-Ferrous iron 3-Hemochromatosis (a hereditary disorder in which there is increased iron absorption.)

Mention briefly the role of the hormone Hepcidin in iron absorption?
Hepcidin is a hormone produced by the liver and stimulated by certain mediators such as IL6 and Tfr2 (transferrin receptor 2). It mainly inhibits iron absorption by inhibiting the transmembrane protein Ferroportin which normally allows passage of iron molecules into the bloodstream.

How does the body's iron status affect iron absorption?
Increased demands of iron (due to deficiency/pregnancy) → low iron stores → high absorption of iron. (and vice versa in cases of iron overload.)

Mention a few causes of iron deficiency anemia?
-Chronic blood loss: peptic ulcers, & uterine bleeding.
-Increased demands: pregnancy.
-Malabsorption: Gastrectomy.

If a patient with iron deficiency anemia is presented with low stores levels, normal MCV/MCH levels, and normal hemoglobin level, in which phase of disease development is he/she in?
In pre-latent phase.

Mention a few signs expected to be seen in patient with iron deficiency anemia?
-Koilonychia (spoon-shaped nails.)
-Angular stomatitis (oral commissures) and/or glossitis.
-Dysphagia. (difficulty or discomfort in swallowing)

Can you mention the difference in iron studies between iron deficiency anemia and thalassemia?
-In iron deficiency anemia there's high TIBC (total iron binding capacity) and low levels of serum iron, serum ferritin, and transferrin saturation.
- In Thalassemia the opposite would occur.

Q13) Name the stain used in the gold standard investigation of iron deficiency anemia?
Perl's stain.

Q14) How do you treat a patient with iron deficiency anemia?
-Treat the underlying cause.
-Iron replacement therapy:
oral (ferrous sulphate OD (over-dose) for 6 months.)
IV (ferric sucrose OD for 6 months.)
With this treatment plan we are expecting hemoglobin to rise 2g/dL every 3 weeks.

Mention the classification of and and the main causes of each type:-
1- Microcytic hypochromic anemia: Hemoglobin (prophyrin,iron or globin chain deficiency)
2- Macrocytic anemia : DNA : A- megaloblastic anemia : vit B12 or folate deficiency
B- MDS
3- Normocytic normochromic anemia (blood loss,hemolysis or RBC production)

What do we mean by Anemia of chronic disease ? and mention the cause of it ?
is a normochromic normocytic anemia caused by decreased release of iron from iron stores due to raised serum Hepcidin.

Anemia of chronic disease mainly associated with: Malignancy

Expected two findings and markers observed upon investigation:
-Normocytic normochromic (or mildly microcytic) anemia under microscope.
-Low serum iron and TIBC

What are your management in Anemia of chronic disease?
-Treat underlying cause.
-Iron replacement +/- EPO (erythropoietin)

BLOOD TRANSFUSION & CROSS MATCHING

23 year old male was brought to the Emergency department after a car accident, he lost a lot of blood and the physician decided to order blood bags from blood banks..

Q1-What is his blood type ? O+
Q2- what is the most common type of blood in general ? O+
Q3-A woman was brought into the emergency and needs a blood transfusion, her blood type A+ . which of the blood groups we should give her ? A+, A-.O+.O-

Define blood transfusion ? It is a treatment that involves giving blood or blood product to a person .

What are the component of human blood ? RBCs, platelets, plasma,WBCs

What are the criteria for blood donation ?
1- good health 2- age (at least 16-70 years) 3- weight at least 50 kg

Mention 2 who *should not* donate blood?
1-Anyone who ever used IV drug 2-Anyone with a +HIV test(AIDS virus)

What is the difference between voluntary and involuntary donors ?

Voluntary	Involuntary
used in - Campaigns. - Outdoor voluntary.	- Relative of patient who receive emergency blood transfusion. - Persons applying for driving licenses.

What is the directed blood donation ? Is giving a blood for one person , ,most often a member of the family .

What are the types of anticoagulant ?

1- ACD-A(NIH-A) →	Store RBCs for 21 days at 1-6 C
2- CPD →	- Store RBCs for 28 days at 1-6 C - Store platelet for 3 days at 20-24 C
3- CPDA-1 →	- Store RBCs for 35 days - platelets for 5 days at 20-24 C
4- Optisol AS 5 →	Store RBCs for 42 days at 1-6 C
5- CPDA-2 →	- Store RBCs for 42 days at 1-6 C - Store platelets for 5 days at 20-24 C

What does autologous donation mean ? Are donations That individuals give for their own use eg: before a surgery .

What is the specific test for syphilis ? VDRL/ RPR/TPHA

-What is the specific test for HIV-1 and HCV?
nucleic acid amplification test

what is the coombs test ?
coombs test are two types :

- **Direcrt :** is used to detect antibodies thats are stuck in the surface of red blood cells , these antibodies sometimes destroy RBCs and cause anemia.
- **Indirect**:looks for free flowing antibodies against certain red blood cells, it is often down to determine if you may have a reaction to a blood transfusion .

What types of tests are performed on donated blood?

ABO group test (blood type) and RH type (+ or -)

What other tests can be performed to avoid antigen antibody reaction?

1- Hepatitis B surface antigen (HbsAg). 2- Hepatitis B core antibody (anti-HBc).

3- Hepatitis C virus antibody (anti-HCV)

How much time can the following blood components be stored?
- **Platelets** : May be stored for 5 days at room temperature without loss of function or viability
- **Granulocytes** : Must be transfused within 24 hours of donation.
- **Plasma** : frozen for up to 1 year.

Mention 3 of each type of Blood Transfusion complications?

1-Immediate Reactions:	2-Delayed Transfusion Reactions:
•Hemolytic Reactions •Allergic Reactions •Febrile Reactions	•Graft Versus Host Disease (GVHD) •Post-transfusion purpura •Transmitted Diseases eg : Hepatitis B , C

Your patient is suffering from an acute transfusion reaction, what should you do?(Mention 4)

- Stop blood component transfusion immediately.
- Maintain blood pressure, pulse.
- Maintain adequate ventilation.
- Obtain blood/urine for transfusion reaction workup.

Sara's sister needs platelets donation(only), what is the procedures that Sara should do?
Apheresis

HAEMOGLOBINOPATHIES

What are the composition of Hemoglobin F?

α2 and γ2.

Write three laboratory diagnosis of alpha thalassemia syndrome.

1- High red cell count in the trait.

2- Hypochromic microcytic red cells & target cells.

3- Normal serum iron or low in children.

Mention four clinical manifestations in Thalassaemias.

1- Pallor. 2- Jaundice. 3- Apathy and Anorexia. 4- Hepato-splenomegaly

Name the most hemoglobins present at birth in normal newborn.

HbF

Mention the important clinical differences between β-Thalassemia Syndromes.

major type: most severe, most symptoms are present, anemia: <7 g/dl.

intermedia: anemia: 7-10g/dl.

miner: anemia: >10g/dl

minim: little or no abnormality, silent, normal Hb level.

Prenatal diagnosis of the haemoglobinopathies is done by DNA analysis of amniotic fluid or fetal blood sample. Mention 3 techniques of DNA analysis.

1- Gene mapping. 2- Oligonucleotide probes 3- Gene amplification.

what are the management methods of thalassemia?

1- blood transfusion. 2- iron chelation therapy 3- splenectomy. 4- Gene therapy.

Explain briefly the treatment of thalassemia major.

1) blood transfusion: if the Hb remains below 8g/dl, give 10-15 mL/kg of blood in 2h, Do not raise the posttransfusion Hb above 16 g/dL. in presence of cardiopathy use fresh blood.
2) iron chelation therapy: Deseferrioxamine S.C or I.V .
3) splenectomy: when blood consumption is more than 1.5 times normal, it increases the risk of infections

how to do an assessment of iron stores? by measuring serum ferritin

Bleeding disorders

Mention the Most important features of platelet disorders and 3 important factors to prevent bleeding? Bleeding and thrombosis /
1- normal blood vessels
2- normal platelets (150-400 x 10^9)
3- Presence of clotting factors

Mention 3 of Hereditary vascular disorders and the most common one ?
1-Hereditary Hemorrhagic Telangiectasia the common one worldwide
2-Homocystinuria 3- Marfan syndrome

Mention the 3 Acquired vascular diseases and talk about each one briefly ?
1-Paraproteinemia and amyloidosis here there is abnormal protein participates on the blood vessels.
2-Senile purpura due to changes happen with increasing in age as the skin and the vessels become more fragile
3-Scurvy vitamin C Deficiency

Talk briefly about platelets formation and mention the normal platelet life span ?
Platelet Formation is by segmentation of the cytoplasm of the Megakaryocyte "The Mother of Platelets" in the bone marrow / 7-10 DAYS

Mention glycoproteins that are found in the normal platelets membrane and disorders that are associated with deficiency ?
These are important in platelets adhesion along with vW factor
1- Gp1b: deficiency is associated with Bernard-Soluier syndrome.
2- Gpllb/llla: deficiency is associated with Glanzmann's disease.
3-Gp1a

Mention two test for measurement of platelet function by?
1-Bleeding time test , 2-Platelet aggregation test: is specific for platelets

Mention 3 causes of acquired platelet dysfunction : 1- uremia 2- Aspirin 3- scurvy
Mention 3 causes of Thrombocytopenia : 1- Infections 2- DIC 3- multiple myeloma

Bleeding disorders

24 year old male presented with a history of E.coli, infection. Now he suffers from fever, renal dysfunction and thrombocytopenia purpura. what is the diagnosis?

-Thrombotic thrombocytopenic purpura (TTP)- Hemolytic-uremic syndrome (HUS)

What are the types ,deficiencies and symptoms of Hemophilia?

Hemophilia A	Hemophilia B	Hemophilia C
factor VIII deficiency	factor IX deficiency	factor XI deficiency
Symptoms: Severe <1 ⇒ Spontaneous bleeding, Joints deformity. Moderate 1-5 ⇒ Post traumatic bleeding. Mild 5-20 ⇒ Post traumatic, but less than the moderate.		

Mention the defected pathway according to the PT and APTT results:

Prolonged PT+Normal APTT⇒ Extrinsic pathway

Normal PT+Prolonged APTT⇒ Intrinsic pathway

Both are prolonged⇒ Common pathway

What are the most important factors to distinguish between Hemophilia A and VW disease?

Haemophilia A	VW Disease
Bleeding time normal	Bleeding time abnormal ★
PT normal	PT normal
PTT abnormal	PTT abnormal
Factor VIII C ↓	Factor VIII C ↓
VWf : normal	vWf ↓
Factor VIII related antigen vMF antigen: normal	vMF antigen ↓
Ristocetin co-factor normal	Ristocetin co-factor low
Platelets aggregation normal	Platelets aggregation abnormal ★

Child who has DIC, blood film was done for him and the result shows promyelocytes. what is the cause for her DIC?

-Acute promyelocytic leukemia.

20 year old presented with DIC afer goning to the desert with his family, Mention the cause for his DIC?

-Snake venom

Megaloblastic Anaemia

A 27 year old male with a history of gastrectomy present with anorexia, weakness, stomatitis and mild jaundice.

Which type of anamia this patient may have?

Megaloblastic anaemia.

What are the major causes of this disease?

Vitamin B12 deficiency & Folate deficiency. drug induced

Mention 3 causes of macrocytosis with the absence of megaloblastic anaemia.

1. Chronic alcoholism. 2. Liver disease. 3. aplastic anaemia.

Mention 3 causes of vitamin B12 deficiency.

1. Inadequate intake. 2. gastrectomy. 3. Crohns disease.

Mention 3 causes of folate deficiency.

1. Inadequate intake. 2. pregnancy. 3. jejunal resection.

Why do vitamin B12 and folate are important in the pathogenesis of megaloblastic anaemia?

Because they are important in DNA replication

Give 3 of possible clinical features of megaloblastic anemia .

1- beefy tongue
2- neural tube defect
3- purpura

Give 3 hematological findings you would see in this patient's peripheral blood.

1- oval macrocytes with high MCV
2- hypersegmented neutrophils
3- leukopenia and thrombocytopenia

How would you treat a patient with megaloblastic anemia due to V B12 deficiency?

give him intramuscular Hydroxocobalamin

What are the conditions that induce a prophylactic intake of folic acid?

1- pregnancy 2- severe haemolytic anaemias
3- dialysis 4- prematurity

Acute Leukaemias

what is the acute leukemia and the results of it ?

accumulation of abnormal (blasts/stem cells/ Immature precursors) of WBC in bone marrow and blood leading to:

1. Bone marrow failure (anemia, neutropenia & thrombocytopenia).
2. Organ Infiltration(hepatosplenomegaly,lymphadenopathy).

Mention the main difference between acute and chronic leukemia ?

the presence of blasts in the peripheral blood which happens only in acute leukemia.

Mention the factors that help in pathogenesis of acute leukemia ?

1-genetic (most important) 2- previous therapy 3- hematological disorder 4- Infection 5- environmental

What is difference between AML and ALL ?

ALL: maturation and differentiation from lymphoid stem cell

AML : maturation and differentiation from myeloid stem cell

Classification and diagnosis of AL depends on :-

1-Clinical history of previous chemotherapy (i.e. from adenocarcinoma)

2-Morphology (Light microscopy)

3-Flow cytometry (immunophenotypic analysis) → Stem Cell Markers: (CD34& TDT)

4- Chromosomal Karyotyping

5-Molecular study : a very specific method (FISH or PCR)

Talk briefly about AML and how to determine this disease ?

Group of hematopoietic neoplasms caused by proliferation of malignant in bone marrow and blood more in adults (do occur in children). The disease is determined by either:

1) Number of blasts ≥20%

2) Translocation t (8; 21), t (16; 16) or t (15; 17) "No matter what percentage the blasts occupy

Mention the clinical feature of AML ?

1-Pancytopenia: Decrease in WBC,Hb and platelets

2-Organ infiltration: Hepatosplenomegaly , Lymphadenopathy(rare) ,Myeloid Sarcoma ,Gum hypertrophy and CNS disease

3-Leukostasis (Increased blood viscosity)

4- Disseminated Intravascular Coagulation DIC

Mention the treatment of AML ?

1-Chemotherapy most of them will cure but there is risk of relapse

2- stem cells transplantation

Case

A 6-year-old boy presents with fatigue, fever, and night sweats. Physical examination reveals marked pallor. Palpation of his sternum demonstrates diffuse tenderness. Laboratory studies disclose anemia, thrombocytopenia, and leukocytosis. The WBC differential count shows that 90% lymphoid blasts.

What is is the your diagnosis? Acute lymphoblastic leukemia .

What are the most commonly affected ages? Children .

How is it classified by FAB & WHO? According to morphology + flow cytometry by FAB & According to Immunophenotype (Genetic) by WHO .

What is the genetic abnormality that has been detected in Burkit's Lymphoma? t(8,14).

Give one specific markers for each of B-ALL & T-ALL?
- for B-ALL CD10 & for T-ALL CD3
Remember! "T-ALL CD-Three- "

In brief describe the prognosis of B-ALL & T-ALL ? - B-ALL have better prognosis than T-ALL.
Give one clinical feature that is characteristic for T-ALL? Medistinal mass "Thymus enlargment"

What type of T-lymphocyte that is abnormal in T-lymphoma & what is the marker that'll be detected? -Mature lymphocyte , sCD3 "surface marker"

What are the clinical features of ALL?
1. Pancytopenia
decrease WBC → Infection (fever, septic shock)
decrease Hb → anemia (fatigue, headache, pallor, SOB....)
decrease Platelets → bleeding (bruises, epistaxis, menorrhagia...)
2. OrganInfiltration:
Lymphadenopathy (very common) , Hepatosplenomegally, Testicles involvement, CNS disease, Mediastinal mass (thymus enlargement) with T-ALL.

Does the Prognosis differ by the gender ?
Yes, Females have better prognosis :) .

Give one example of subtype that has good prognosis? B-ALL [CD10, t (12; 21)]

Chronic Leukaemias

Case 1

A 42-year-old man presented with abdominal discomfort, fatigue and weight loss. After the clinical examination it turns out he has a massive splenomegaly.

•CBC shown in table 1.

•Blood film smear shows granulopoiesis, band and segmented neutrophils.

•Puncture of the iliac crista showed a hypercellular marrow.

•Chromosomal analysis demonstrates Philadelphia chromosome (Phl) positive.

Hb	9 g/dL
WBC	130 x 10^9/l
Platelets	435 x 10^9/l
Blasts	12%
WBC differential	
Neutrophils	10%
Bands	13%
Basophils	40%

Table 1

What's your main differential diagnosis? –If molecular studies were not available-
Chronic myelomonocytic leukemia & Leukemoid reaction

What's the definitive diagnosis? Chronic myeloid leukemia (CML)

What's the abnormal gene that you're expecting to find in ph chromosome?
BCR-ABL1 which was a result from t(9;22)

Describe the effect of the mutation mentioned in previous question on the cellular basis?
Tyrosine kinase > Activation of signal transduction pathways => Uncontrolled proliferation

According to the CBC in what phase the patient is? Accelerated phase

Patient was treated by Imatinib, what is its mechanism of action? Tyrosine kinase inhibitor.

Case 2

A 44-year-old man, alcoholic, presented with busies and epistaxis, and his clinical history shows recurring infections.Further investigations shows:

•Low Hb, Low WBC and Low platelets

•Blood film smear is shown in image A.

•Puncture of the iliac crista showed a hypercellular marrow.

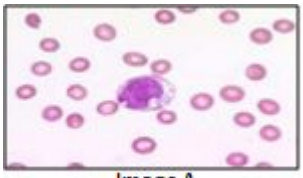


Image A

What's the most likely diagnosis?
Myelodysplastic syndrome (MDS)

This disease is further divided according to..?
Blast count, Degree of dysplasia and Genetics

Describe the types of abnormalities you see in image A?
Dysplasia and pancytopenis

Case 3

A 78-year-old man presents with a three-year history of an elevated leukocyte count with recent fatigue and anemia. Further investigations shows:

•CBC shown in table 2.

•Chromosomal analysis demonstrates Philadelphia chromosome (Phl) negative.

Hb	9.3 g/dL
WBC	75,000/uL,
Platelets	71,000/uL
Blasts	7%
WBC differential	
Neutrophils	60%
Lymphocytes	19%
Monocytes	15%
Eosinophils	6%

Table 2

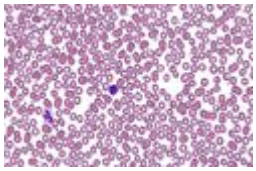
What's the most likely diagnosis?
Chronic myelomonocytic leukemia (CMML)

What's the features that this disease is showing?
Dysplasia, Enhanced apoptosis and Marked Proliferation

What's the prognosis of this disease?
Bad, survival rate around 2.5 y

Polycythemia

75 year old male has Symptoms of severe headache and generalized pruritis and the physical exam show "Spleen palpable 10 cm. below left costal margin. Liver palpable 3 cm. below right costal margin." The rest of the exam was within normal limits.



What is your diagnosis ? Polycythemia vera

What are investigations that you need to confirm your diagnosis ?

CBC , Blood smear , Bone marrow

Describe the appearance of RBC in blood smear ? Excess of normocytic normochromic RBC

What is the treatment for PV ?

•Venesection + Aspirin • ± Myelosuppressive drugs (hydroxyuria)

What are the classification of polycythemia and cause of each class ?

-**Relative polycythemia** due to severe dehydration

-**Secondary polycythemia** due to high EPO ex: in smoking , High altitude , renal disease , COPD, Sleep apnea, Parathyroid adenoma .

-**Polycythemia vera** due to malignant proliferation.

What is Polycythemia vera ?

MPN characterized by increased red blood cell production independent of the mechanisms that normally regulate erythropoiesis.

Name a mutation that related strongly with Polycythemia vera ?

JAK 2 mutation which is a Point mutation (at codon 617 in JH2) leads to loss of auto inhibitory control over JAK2.

What are the main Clinical features of PV ?

1- Increased blood viscosity "Hypertension , Headache, 2- Thrombosis " DVT , MI "

3- Splenomegaly in 70% 4- Hepatomegaly in 40%

Primary Myelofibrosis (PMF):

- Characterized by:-

1- proliferation of megakaryocytes and granulocytes. 2-deposition of fibrous tissue. 3-BCR-ABL Negative.

- Clinical features:-

1-AML transformation(20%). 2-jak2 mutation(50%).

3-massive splenomegaly. 4-anaemia because of bone marrow fibrosis.

- Stages:-

1-Prefibrotic:proliferation of megakaryocytes and granulocytes →leukocytosis & thrombocytosis. 7-10Y

2-fibrotic:Anaemia ,leukopenia ,thrombocytopenia and extramedullary hematopoiesis 3-7Y.

3-ACL transformation <1Year

Essential Thrombocythemia (ET):

- Characterized by: 1- sustained thrombocytosis. 2-BCR-ABL negative. 3-proliferation megakaryocytic only.
- Diagnostic features: 1-sustained thrombocytopenia. 2-jak2 mutation (60%). 3-hypercellular BM.
- Clinical presentation: 1-asymptomatic. 2-thrombosis. 3- bleeding.
- Treatment: Aspirin w/o Hydroxyurea .

JAK2 mutation:

- Non receptor protein tyrosine kinase involved in signal transduction pathway.
- Point mutation leads to loss of auto inhibitory control over
- JAK2.JAK2 mutation activation of transcriptional factors:-

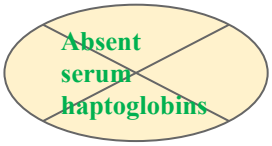
1- Increased proliferation. 2- Decreased apoptosis.

APPROACH TO HAEMOLYSIS

What is hemolysis ? premature destruction of RBCs

Mention the laboratory features of hemolysis ?

- serum bilirubin
- urine urobilinogen
- faecal stercobilinogen
- lactate dehydrogenase



Mention the causes of hemolysis and give example for each one of them ?

1-intracorpuscular (defect in RBCs) as congenital hemolytic anemia .

2-extracorpusal(defect in the surrounding environment of the RBCs)as acquired anemia

Mention the types of hemolysis ?

1-intravascular → process of breakdown of RBCs directly in the circulation .

2-extravascular → excessive removal of RBCs by cells of RE system in the spleen and liver.

Mention the main laboratory features of intravascular haemolysis ?

1-hemoglobinemia and hemoglobinuria 2-haemosiderinuria

Mention TWO causes of intravascular haemolysis ?

1-G6PD deficiency with oxidant stress 2-red cell fragmentation syndromes

Mention TWO abnormal hemoglobins and their substitution ?

- HB.s 6 glu → VAL - HBc. 6 glu → LYS

Mention TWO causes of congenital hemolytic anemia ?

1-sickle cell disease 2-thalassemia

Mention two types of acquired hemolytic anaemia:

- Intravascular hemolysis. - Infections: malaria

Mention two of the most important hemoglobin mutants:

Hemoglobin mutants	Substitution	Disease
Hb S	α2 β2 6-GLU>VAL	Sickle cell
Hb C	α2 β2 6-GLU > LYS	Thalassemia or sickle cell anemia

Case: If both parents were carriers (traits) of an abnormal allele of the same type (HbS) what will be seen in their childrens?

25% of their children will be severe sickle cell patients (diseased) Termed as homozygous sickle cell disease(SCA).

What are the properties of HbS?

1- Solubility is low. 2- Increase mechanical fragility→hemolysis 3- Increase viscosity → organ infarction

Mention the factors which affect sickling:

1- Oxygen tension (50-60mmHg for SS - 20-60mmHg for AS) 2- pH

3- Presence of other hemoglobins will decrease the severity of the disease.

Mention the clinical manifestations of Sickle cell disease:

1- Hemolytic anemia. 2- Tissue infarction.

Hand-Foot syndrome in young children and leg ulceration are clinical manifestation of sickle anemia.

Mention two most important of laberatory methods to diagnose sickle anemia:

- Sickle Solubility Test (usually positive).
- **Hb Electrophoresis** → It is the most important and confirmative test for the sickle cell anemia

Lymphoploriferative disorder

What is the definition of lymphoma ?
Malignant lymphoid mass involving the lymphoid tissues ± other tissues .

Mention the type of virus that cause Infectious mononucleosis. Epstein-Barr virus

Mention some characteristics of Infectious mononucleosis.
fever ,swollen lymph nodes (painful) ,Sore throat, atypical lymphocyte ,Affect young people

Mention some lab Investigation could be done to diagnose Infectious mononucleosis.
- Virus specific antibodies - Heterophile antibodies

What is the most common adult leukemia ? Chronic Lymphocytic Leukemia

Mention some important features of Chronic Lymphocytic Leukemia
Small mature-appearing lymphocytes ,Condensed "soccer ball" nuclear chromatin Numerous "smudge cells"

What are the types of Burkitt's (Burkitt's lymphoma is the **fastest growing tumor** in humans**) Lymphoma?**

Endemic	**associated with chronic malaria and EBV In equatorial Africa . It particularly affects the jaw, other facial bone and breast.**
Sporadic	**throughout the world and affects GIT.**
Immunodeficiency-associated	**associated with HIV infection or the use of immunosuppressive drugs**

Mention the following?
a.The mutation in Follicular Lymphoma: Overexpression of Bcl2 caused by t(14;18) .

b.Multiple myeloma tried abnormalities:
• Accumulation of plasma cells in the bone marrow
•Lytic Bone lesions
• Production of a monoclonal immunoglobulin (Ig) or Ig fragments

What is the difference between hodgkin and non-hodgkin carcinoma?
the presence of few large binucleated cells (Reed-Sternberg) +contains: CD 15+CD 30 positive in hodgkin only

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