431 Teams
medical students

Haematology

431 Team

Practical

Team Leaders

Shatha almweisheer & Nasser alsaleh

DoneBy Tarfah Al-Obaidan & Mosaed Aldekhayel

RevisedBy Reem AlMansour

HAEMOGLOBINOPATHIES PRACTICAL

Important things that you should know:

1- The normal types of Hbs in adults are: Hb A, Hb A_2, Hb F

2- When we collect the sample we do these tests in order:

A- Complete blood count (CBC)

B- Blood film.

C- Hemoglobin electrophoresis (one of the best tool in Hb disorders)

D- Genetic studies.

3-The normal values of different type of Hemoglobin in electrophoresis:

HbA→96-98%

Hb F→<2% in normal healthy patient (it may be .5, .2,.1 but sometimes we cannot detect it by electrophoresis=0, so we use gene study)

Hb A_2→1.5-3.5 (it is important for the diagnosis of Beta-thalassemia)

If it is >3.5→Beta-thalassemia

If it is <1.5→ Possibly Alpha thalassemia

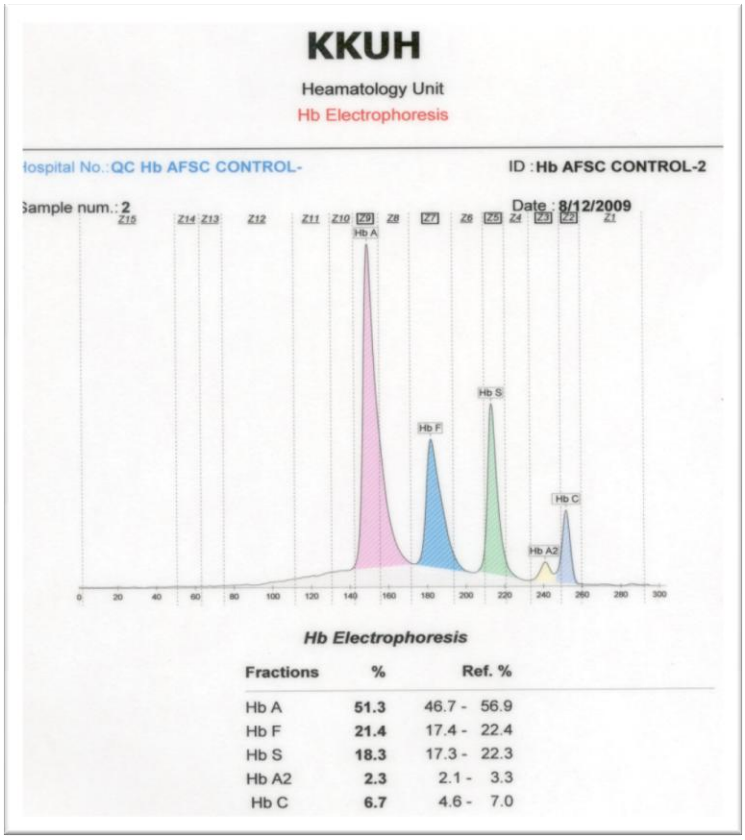
4- To differentiate Beta-thalassemia from S-Beta thalassemia, we focus on HbA2; if its percentage >3.7% it is S-Beta thalassemia. If its percentage >3.5% and <3.7% it is Beta-thalassemia.

5- In the exam the doctor said that it is important to comment on everything either normal or abnormal (so you should memorize the numbers)

6-Hb S =<45% sickle cell trait

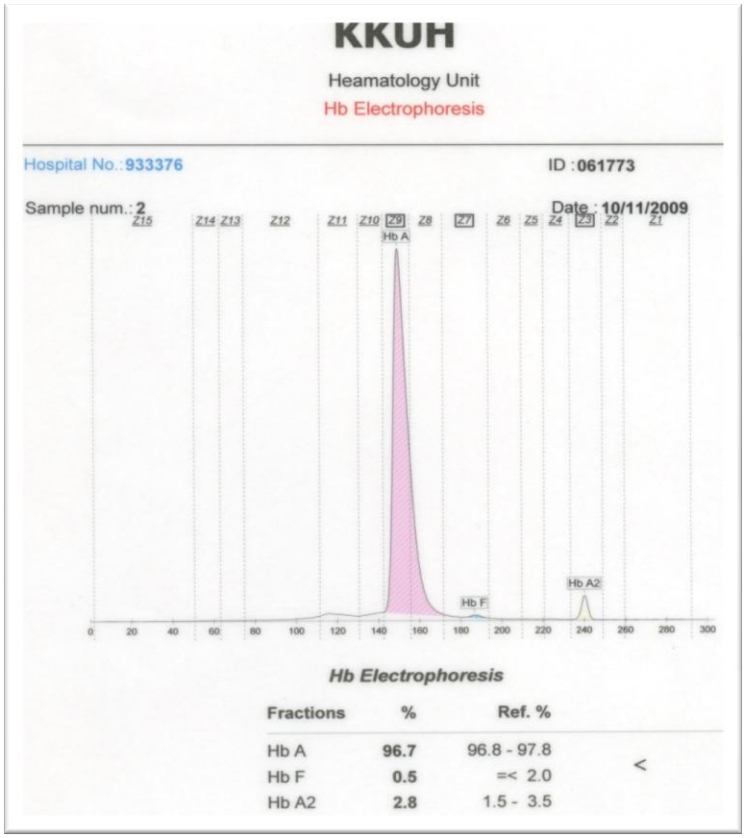
Hb S >45% sickle cell anemia (SA), and sickle cell disease should be considered.

This graph for learning purposes.



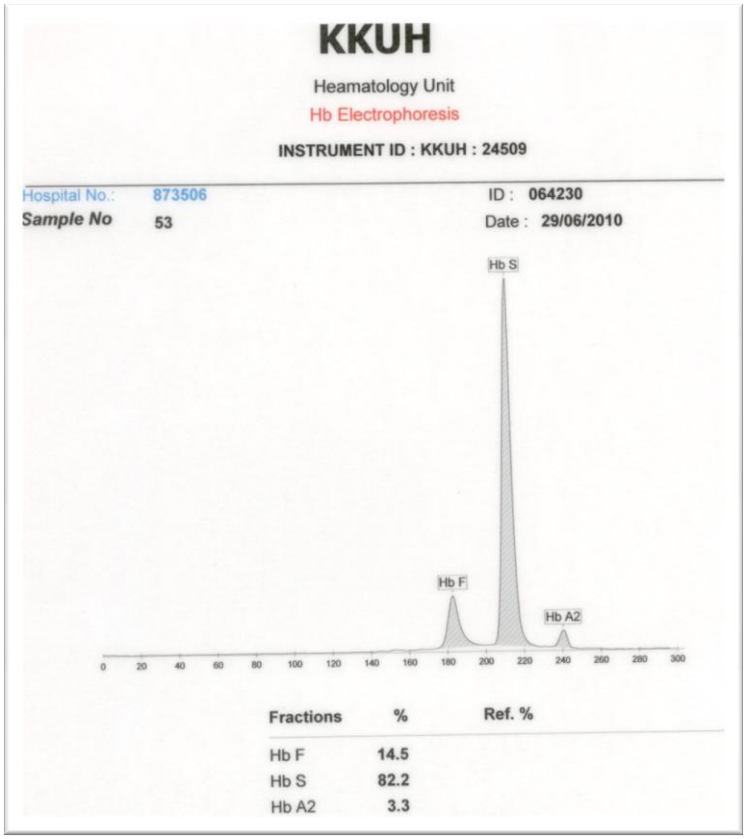
This is control electrophoresis
Hbs appear in this order:
Hb A, Hb F, Hb S (abnormal)
, Hb A_2, Hb C (abnormal)

Name of the test	Hb electrophoresis (this is the normal one)
Hb A	96-98%
Hb F (high In early childhood)	<2%
Hb A_2	1.5-3.5

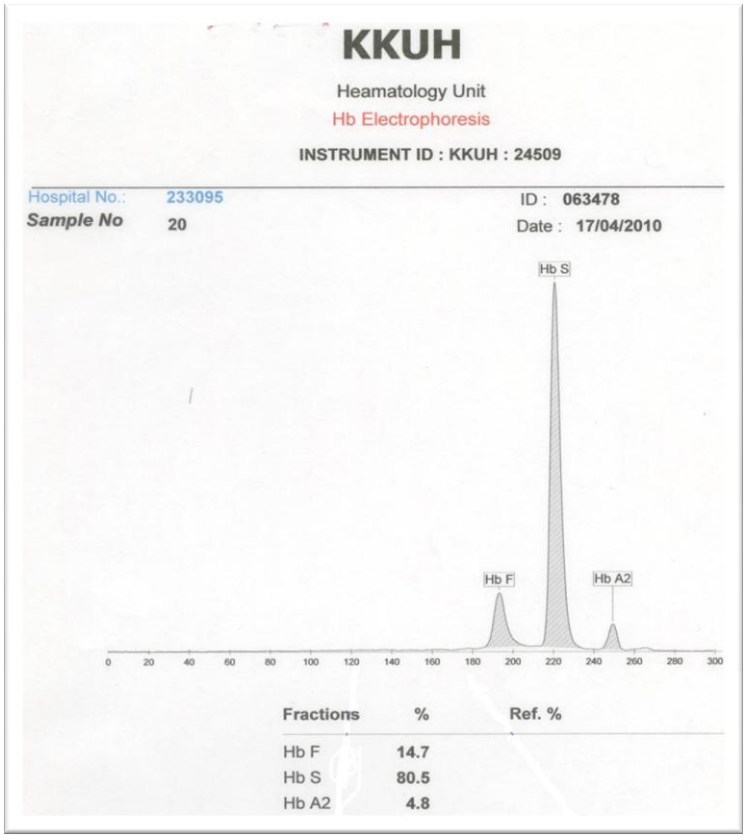


Name of the test	Hb electrophoresis
Hb A	Absent
Hb F	Increased
Hb S	*Increased (sickle cell anemia)
Hb A_2	normal
Further investigation	Gene study (for confirmation)
Diagnosis	Sickle cell anemia with increased Hb F

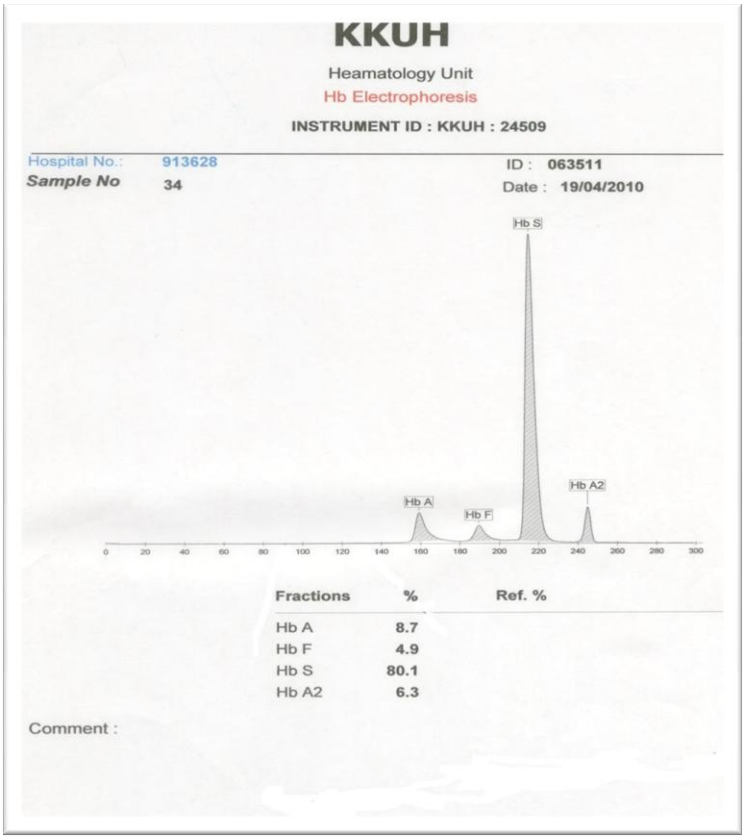
* Increased (More than 45%)



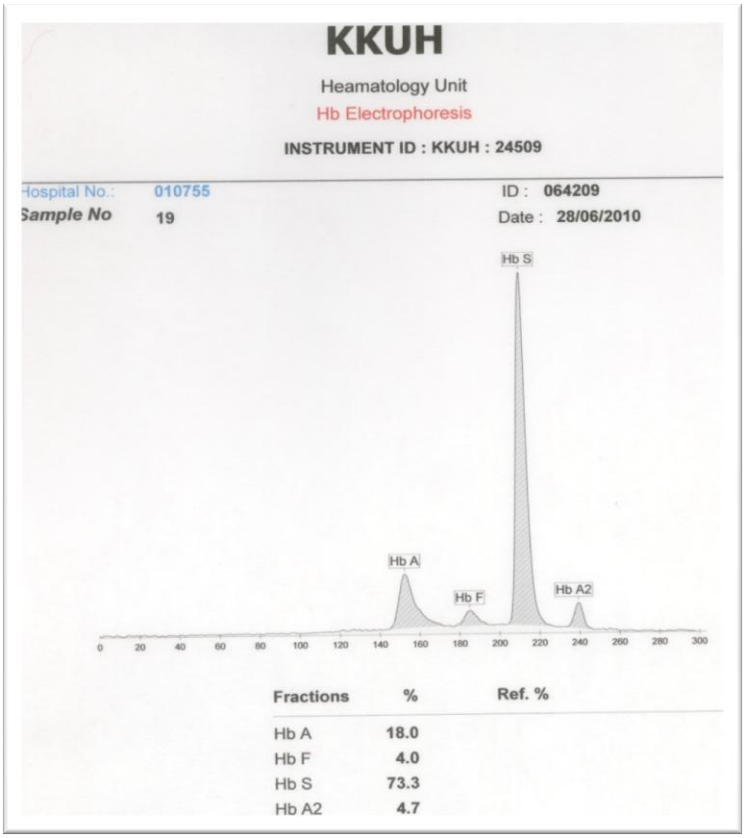
Name of the test	Hb electrophoresis
Hb A	Absent
Hb F	Increased
Hb S	Increased (sickle cell disease)
Hb A_2	Increased (beta thalassemia)
Further investigation	Gene study (for confirmation)
Diagnosis	Sickle cell anemia and beta thalassemia with increased Hb F



Name of the test	Hb electrophoresis
Hb A	Decreased (present)
Hb F	Increased
Hb S	Increased (sickle cell anemia)
Hb A_2	Increased (beta thalassemia)
Further investigation	Gene study (for confirmation)
Diagnosis	Sickle cell anemia(disease), beta thalassemia& presence of Hb A (due to blood transfusion)

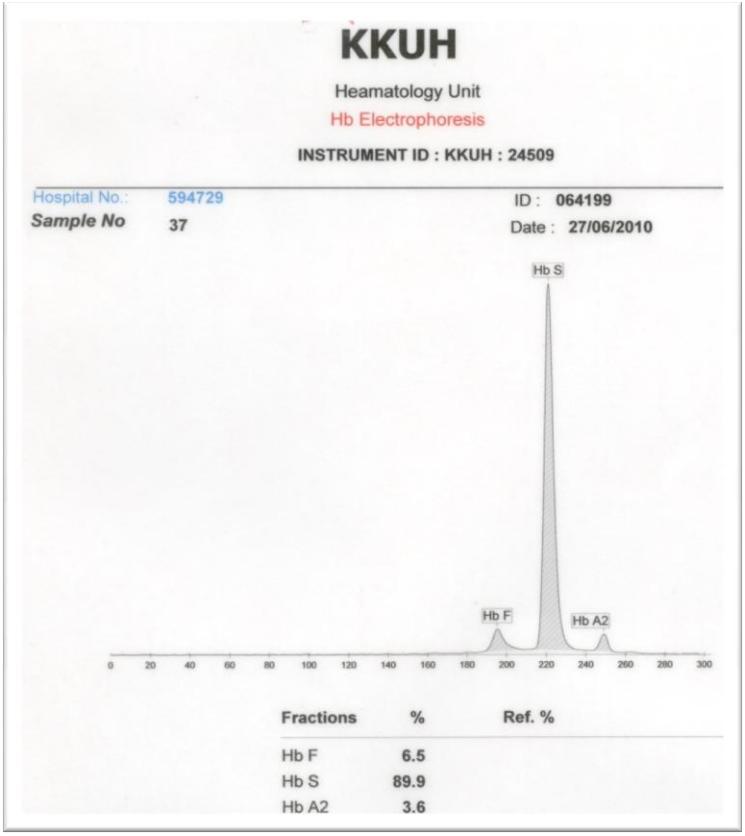


Name of the test	Hb electrophoresis
Hb A	Present
Hb F	Increased
Hb S	Increased (sickle cell anemia)
Hb A_2	Increased (beta thalassemia)
Further investigation	Gene study (for confirmation)
Diagnosis	Sickle cell anemia(disease), beta thalassemia& presence of Hb A (due to blood transfusion)

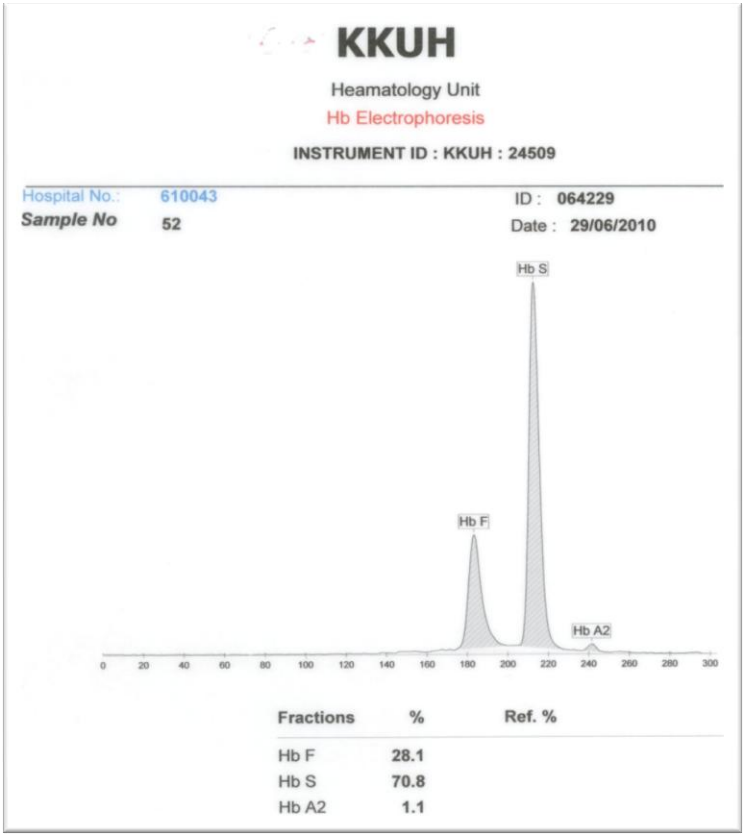


Name of the test	Hb electrophoresis
Hb A	Absent
Hb F	Low (in severe cases)*
Hb S	Increased (sickle cell anemia)
Hb A_2	Normal (the doctor said that we considered 3.6 and less is normal)
Further investigation	Gene study (for confirmation)
Diagnosis	Sickle cell anemia(disease)

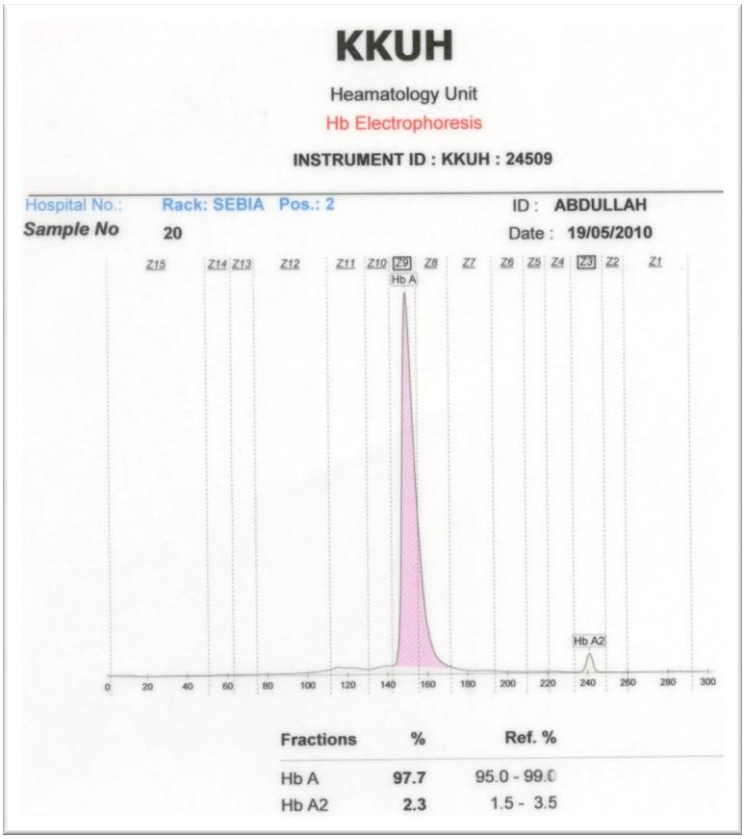
*In mild cases, Hb F will be >15%.



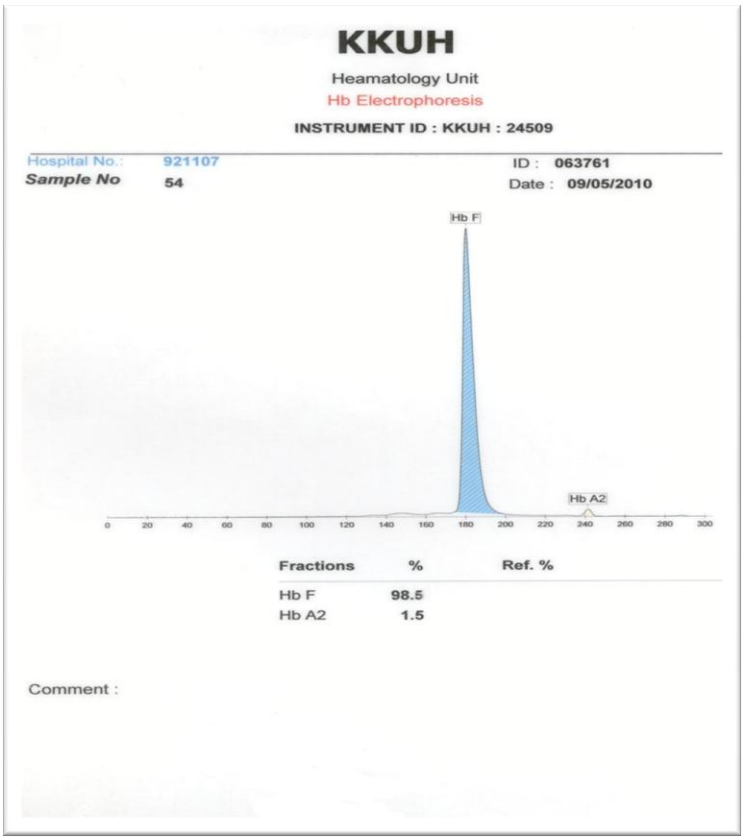
Name of the test	Hb electrophoresis
Hb A	Absent
Hb F	Increased (very high)
Hb S	Increased (sickle cell anemia)
Hb A_2	Decreased
Further investigation	Gene study (for confirmation)
Diagnosis	Sickle cell anemia(disease) & alpha thalassemia with raised Hb F



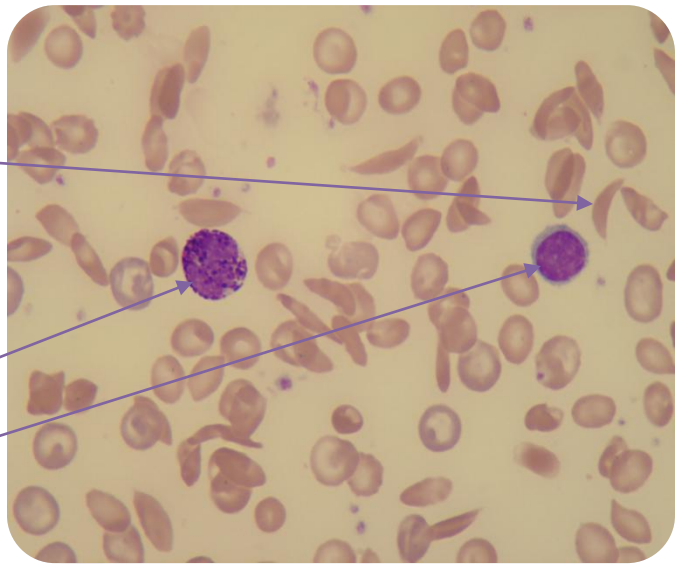
Name of the test	Hb electrophoresis
Hb A	Normal
Hb F	Absent (the doctor said that sometimes we can't detect it in)
Hb A_2	Normal
Further investigation	Gene study (for confirmation)
Diagnosis	Normal



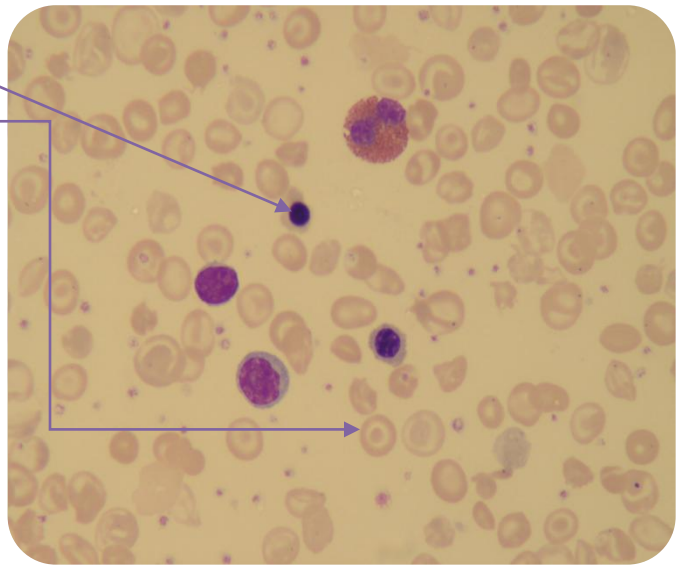
Name of the test	Hb electrophoresis
Hb A	Absent
Hb F	Increased (very high)
Hb A_2	Normal
Further investigation	Gene study (for confirmation)
Diagnosis	Hereditary persistence Hb F



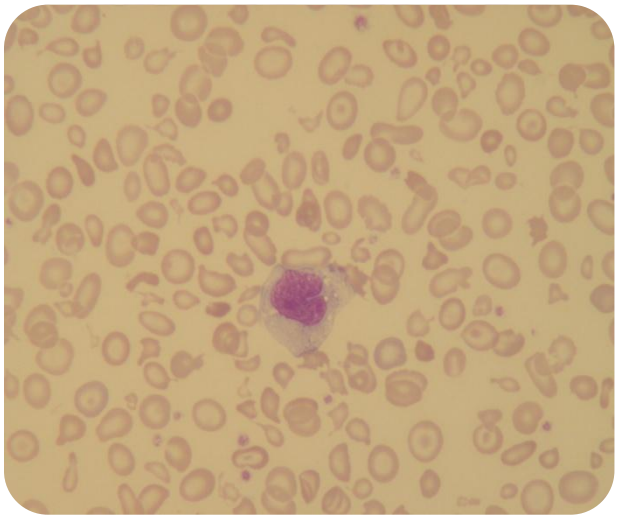
Name of the test	Blood film
Findings **Most important:**	-Sickled RBC (classical) -Target cells. - MCV & MCH are normally normal but few hypochromic/microcytic cells are present.
Other findings:	-Basophil -Lymphocyte
Further investigation	Hb electrophoresis.
Diagnosis	Sickle cell anemia



Name of the test	Blood film
Findings	-Erythriod precursor (immature RBCs) -Target cells. -hypochromic/microcytic. - Nucleated RBCs. - Anisocytosis and Poikilocytosis.
Further investigation	Hb electrophoresis then genetic studies, serum iron, TIBC & ferritin.
Diagnosis	Consistent with beta thalassemia major.

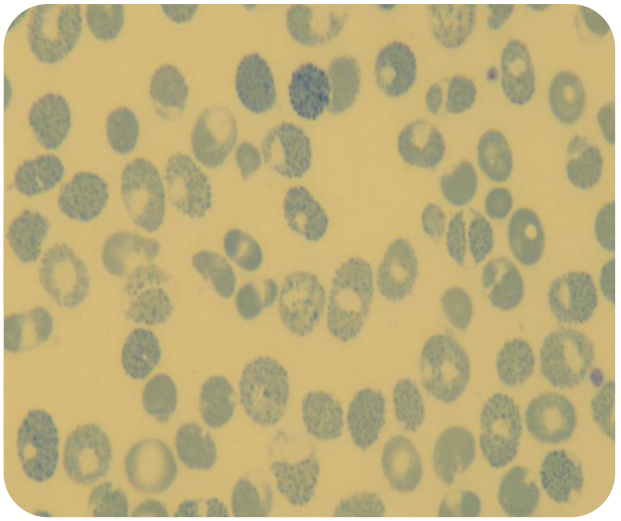


Name of the test	Blood film
Findings	-Target cells. -hypochromic/microcytic
Further investigation	Hb electrophoresis
Diagnosis	Alpha thalassemia(no erythriod)

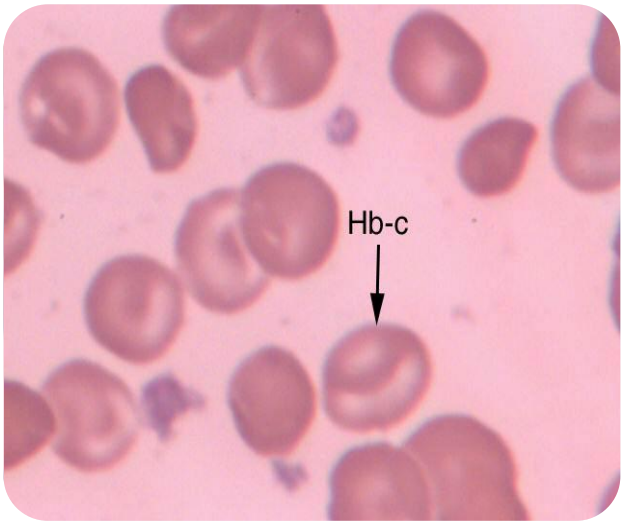


Name of the test	Blood film
Findings	golf ball appearance indicate (Hb H)
Further investigation	Hb electrophoresis
Diagnosis	Hb H disease (Alpha thalassemia)

Stained by: Supravital stain/ Methylene blue.



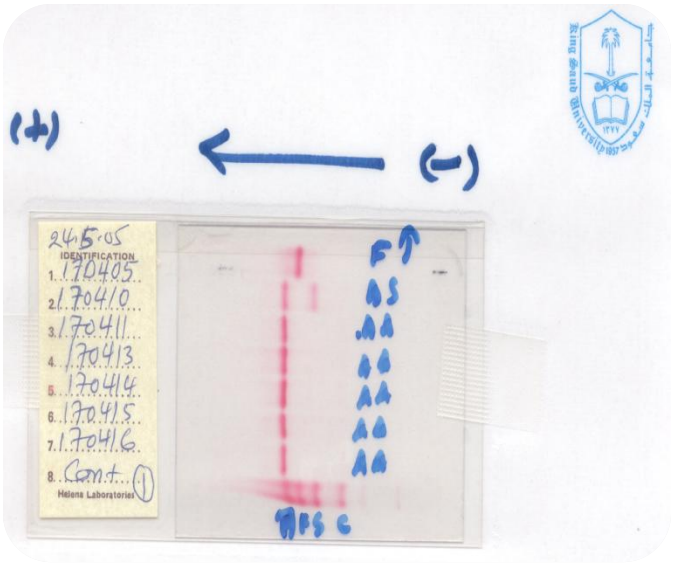
Name of the test	Blood film
Findings	Crystals within RBCs (C-shaped) -Target cells. -hypochromic/microcytic
Further investigation	Hb electrophoresis
Diagnosis	Hb C disease

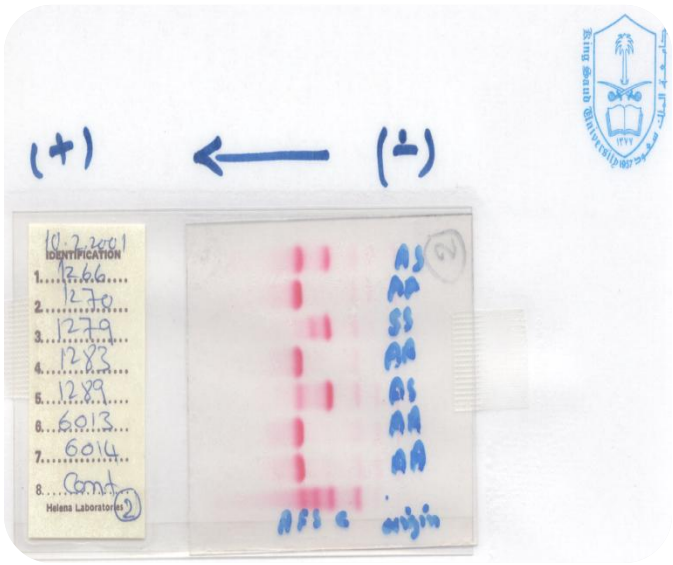


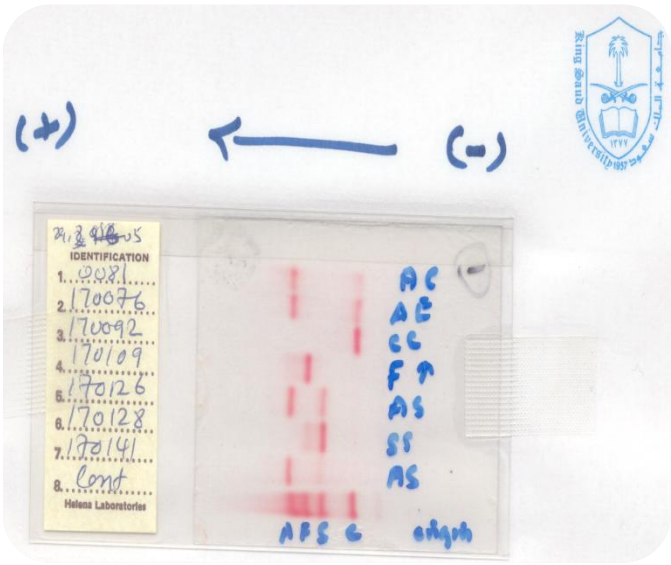
***The doctors said that the last 4 slides are not important:**

Gel electrophoresis (old one)

Compare the blood of many patients with control sample. When the band appears within any type of Hbs it indicates the disease related to that type e.g. SS→ sickle cell anemia.







Hope you all get a full mark (=