بسم الله الرحمن الرحيم

Case presentation

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Supervised by
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Name: Easamen Hasen Ahmed.

Age: 8 years old.

Sex: female.

Address: Nineveh / hay- Al wahda.

Occupation: student.

Date of admission & examination: 18-2-2014

Chief complaint:

Pallor for long time duration(for many years).

History of present illness:

Eight years old female child presented with pallor since birth and recently presented with occasional bouts of passing dark red color urine that neither associated with dysuria nor present at specific time of day ,otherwise she had good general condition with normal growth and development.

Past surgical history : -ve.

Past medical history: no history of any blood transfusion .

Drug history :

No drug allergy .

Social history: she has 1 sister and 2 brothers (all are healthy), her parents are 2st degree relative.

Family history: no history of any hematological disease in her family.

Review of other systems:

Nothing significant .

On examination

female child, conscious, afebrile, pale , tint of jaundice, not dyspneic.

Abdomen: soft,splenomegaly 4 cm below costal margin ,

no hepatomegaly.

Chest: clear.

no Lymphadenopathy, no skin discoloration, no leg edema.

INVESTIGATIONS

U/S of abdomen:

- Shows normal liver size (11cm) & echogenicity.
- Gall bladder contain 6 mm solitary stone reflection,normal biliary passages.
- Splenomegaly (14 cm) size of normal echogenicity.
- Both kidneys normal in size,shape,cortical thickness.
- Normal urinary bladder.

Biochemical tests

Blood urea :	3.0 mmol/l	(3-3.7)
S. Creatinine :	54 Mmol/l	(up to124mmol/l)
Total serum protein :	69 g/l	(60-80)
S.A.L.T.(G.P.T.) :	2 u/l	(Up to 12)
S.A.S.T.(G.O.T) :	4 u/l	(Up to 12)
S.Alkaline phosphatase :	604 u/l	(250_775)
Serum total bilirubin :	4.6 mg/dl	(0.3_1.0)
S.Direct bilirubin :	1.1 mg/dl	(0.1_0.4)
S.Indirect bilirubin :	3.5 mg/dl	(0.2_0.8)
S.Ferritin :	277 ng/ml	(13_124)

Screening test for hepatitis VIRUS & HIV

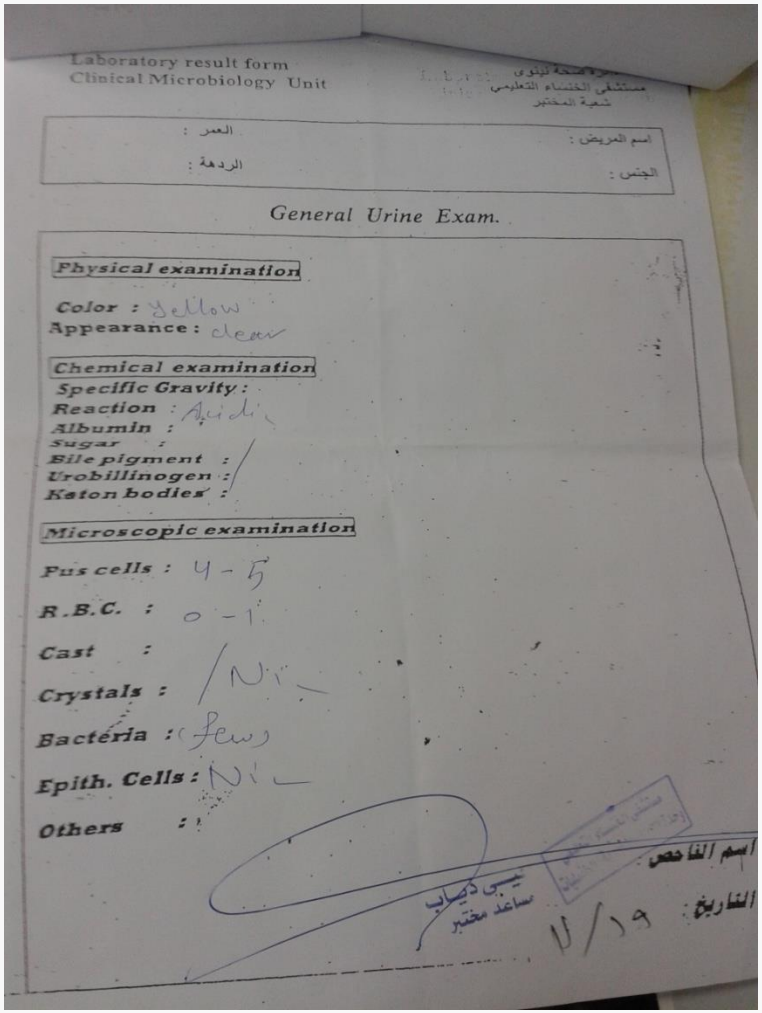
HAV: negative**.**

HBsAg:negative.

HCV:negative**.**

GUE

Normal



Laboratory result form
Clinical Microbiology Unit

العمر :
الردهة :

اسم المريض :
الجنس :

General Urine Exam.

Physical examination

Color : Yellow
Appearance : clear

Chemical examination

Specific Gravity :
Reaction : Acidic
Albumin :
Sugar :
Bile pigment :
Urobillinogen :
Keton bodies :

Microscopic examination

Pus cells : 4 - 5
R.B.C. : 0 - 1
Cast :
Crystals : Nil
Bacteria : Few
Epith. Cells : Nil
Others :

اسم الفاحص :
التاريخ : ١٢/١٩

CPC 9_2_2014

Hb	**g/dl**	**8.5**	**11.5-15.5**
Pcv	l/l	0.28	0.35-0.45
Mcv	fl	67.1	77-95
MCH	**Pg**	21.5	25-33
WBCS	**$X10^9/L$**	12.2	5-13
Neutrophils	$X10^9/L$	6.9	2-8
Lymphocytes	$X10^9/L$	4	1-5
Monocytes	$X10^9/L$	0.7	0.2-1.0
Eosinophils	$X10^9/L$	0.4	0.1-1.0
Platelets count	$X10^9/L$	301	170-450
Retic count	%	5 %	0.5_2.5%

Blood film:

- RBC: hypochromic microcytic with marked anisopoikilocytosis & normoblast 2/100 WBC .
- WBCs: all are mature.
- Platelets: adequate in film.

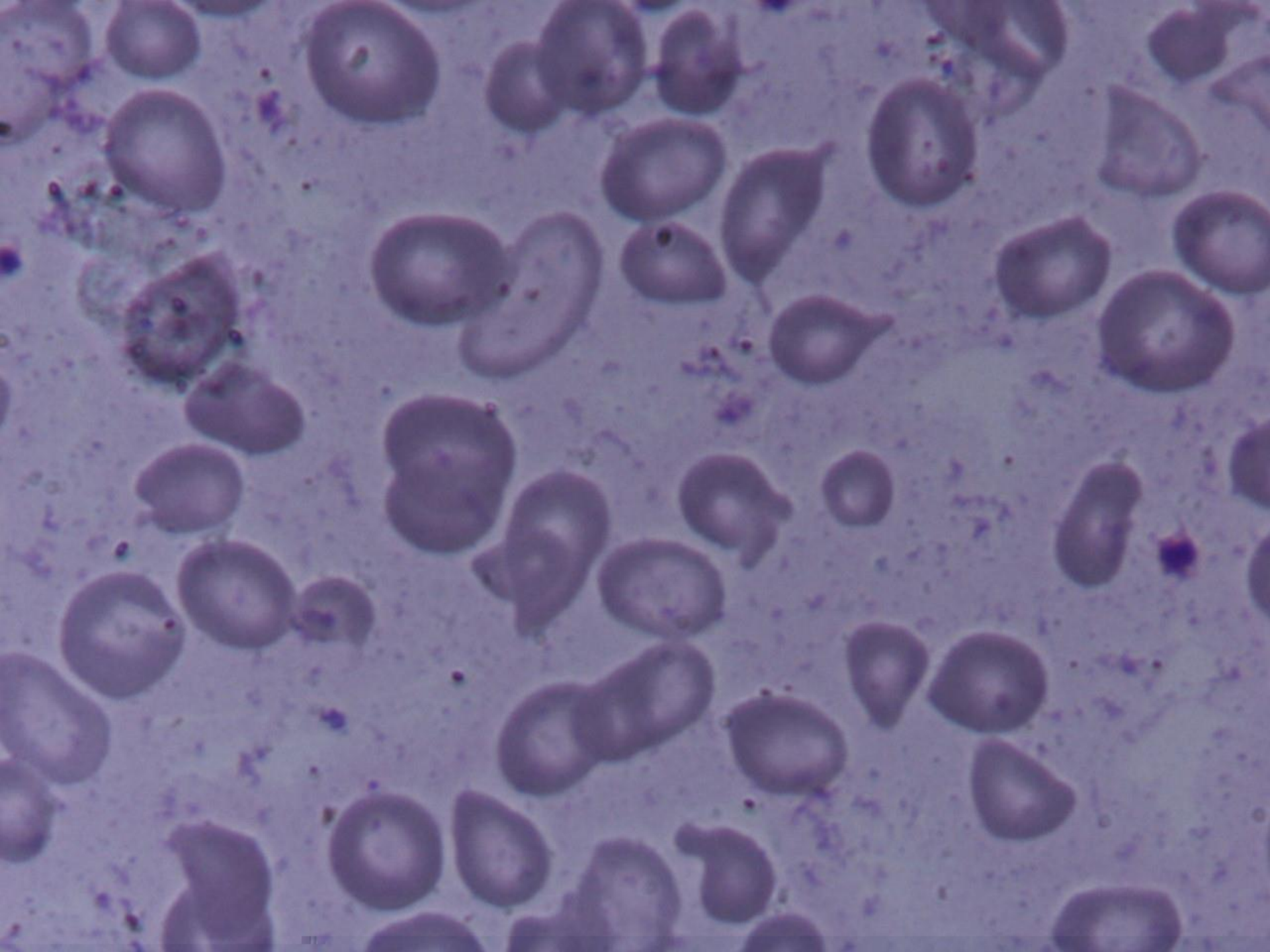
- Conclusion: moderate hemolytic anemia.

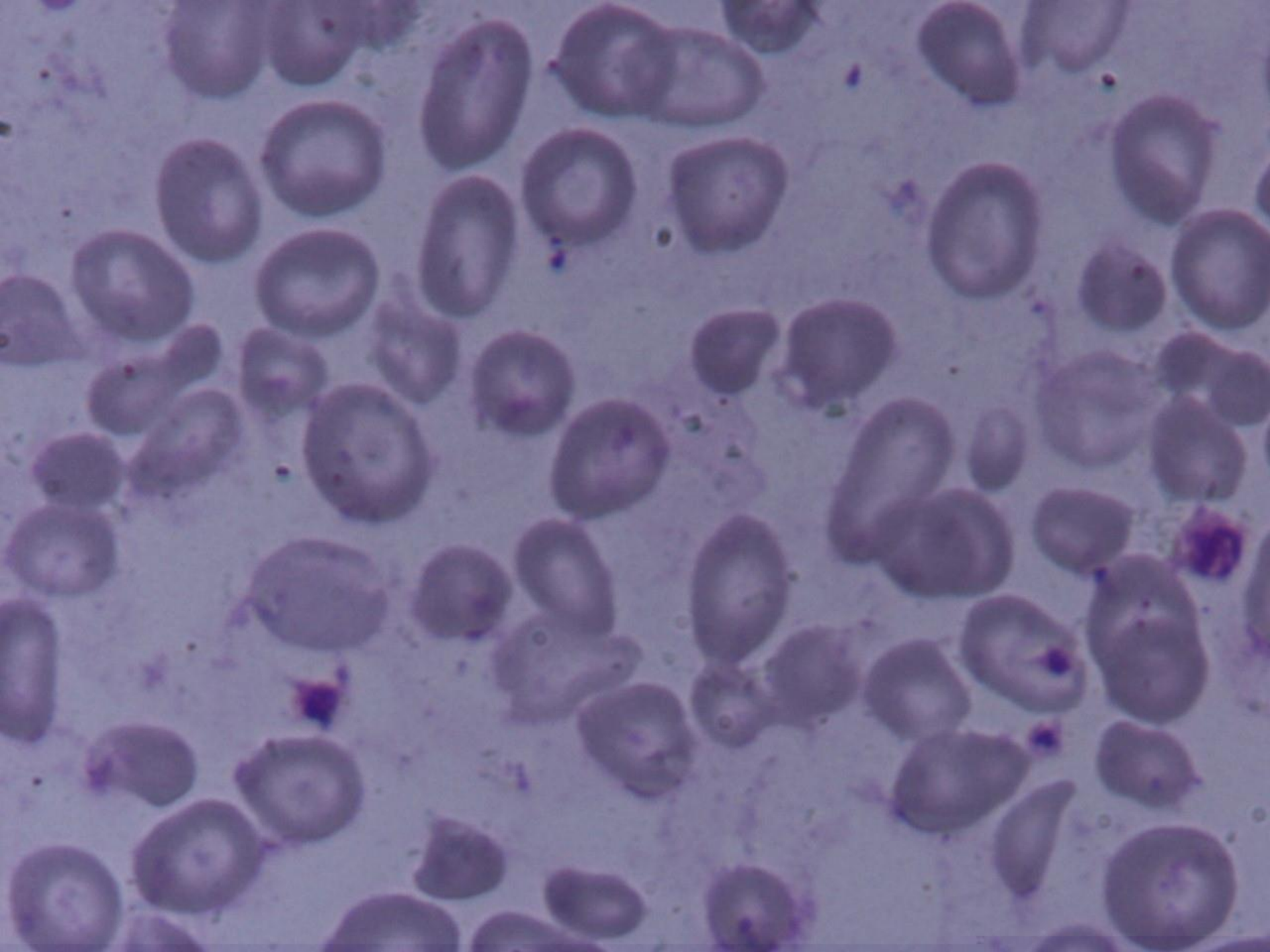
CPC 16 _2_2014

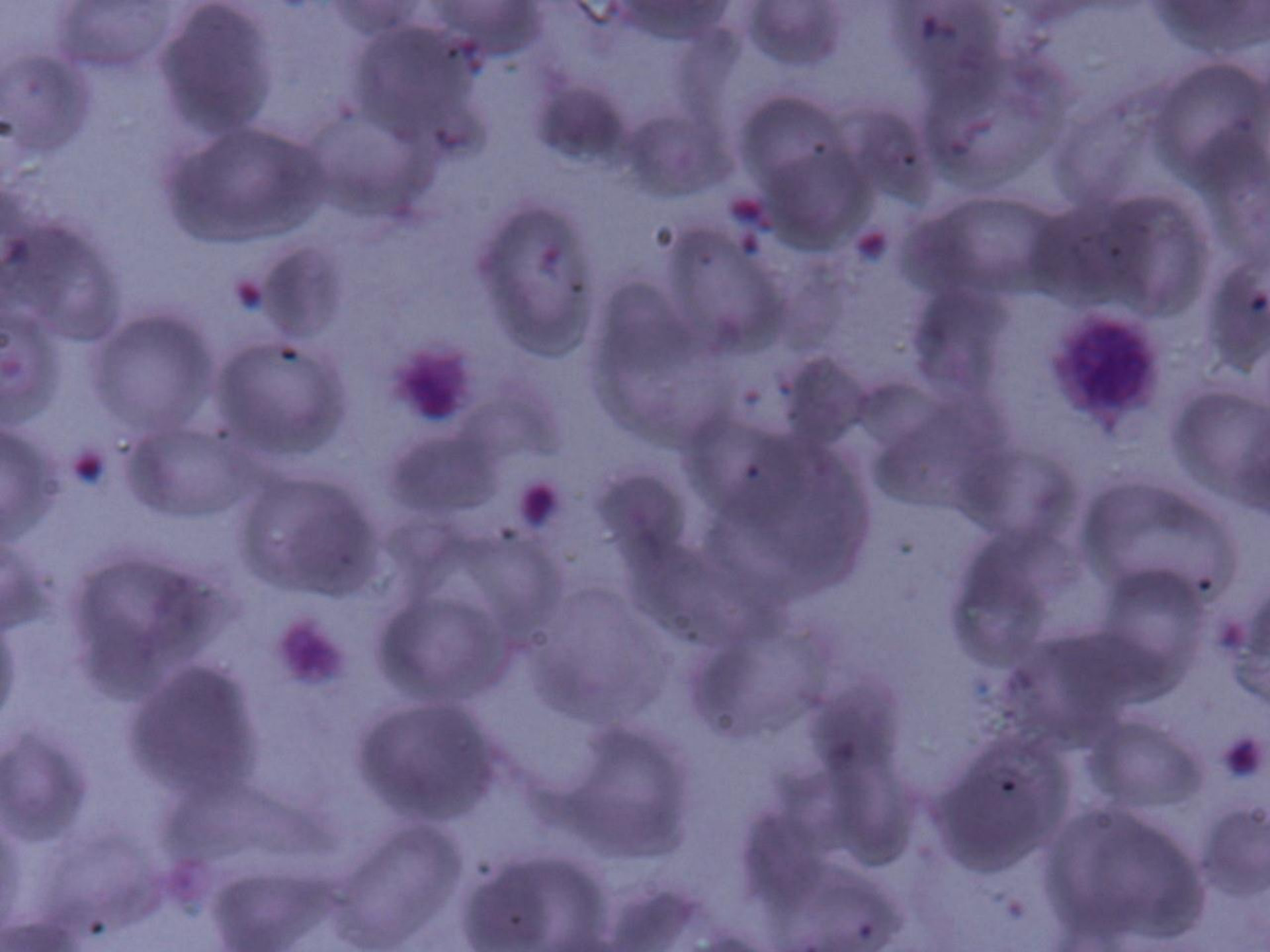
Hb	**g/dl**	**9.6**	**11.5-15.5**
Pcv	l/l	0.30	0.35-0.45
Mcv	fl	68	77-95
MCH	Pg	21	25-33
MCHC	g/l	318	310-370
WBCs	**$X10^9/L$**	14.5	5-13
Neutrophils	**$X10^9/L$**	8.1	2-8
Lymphocytes	**$X10^9/L$**	4.5	1-5
Monocytes	**$X10^9/L$**	1	0.2-1.0
Eosinophils	**$X10^9/L$**	0.5	0.1-1.0
Platelets count	**$X10^9/L$**	244	170-450
Retic count	**%**	5	0.5_2.5

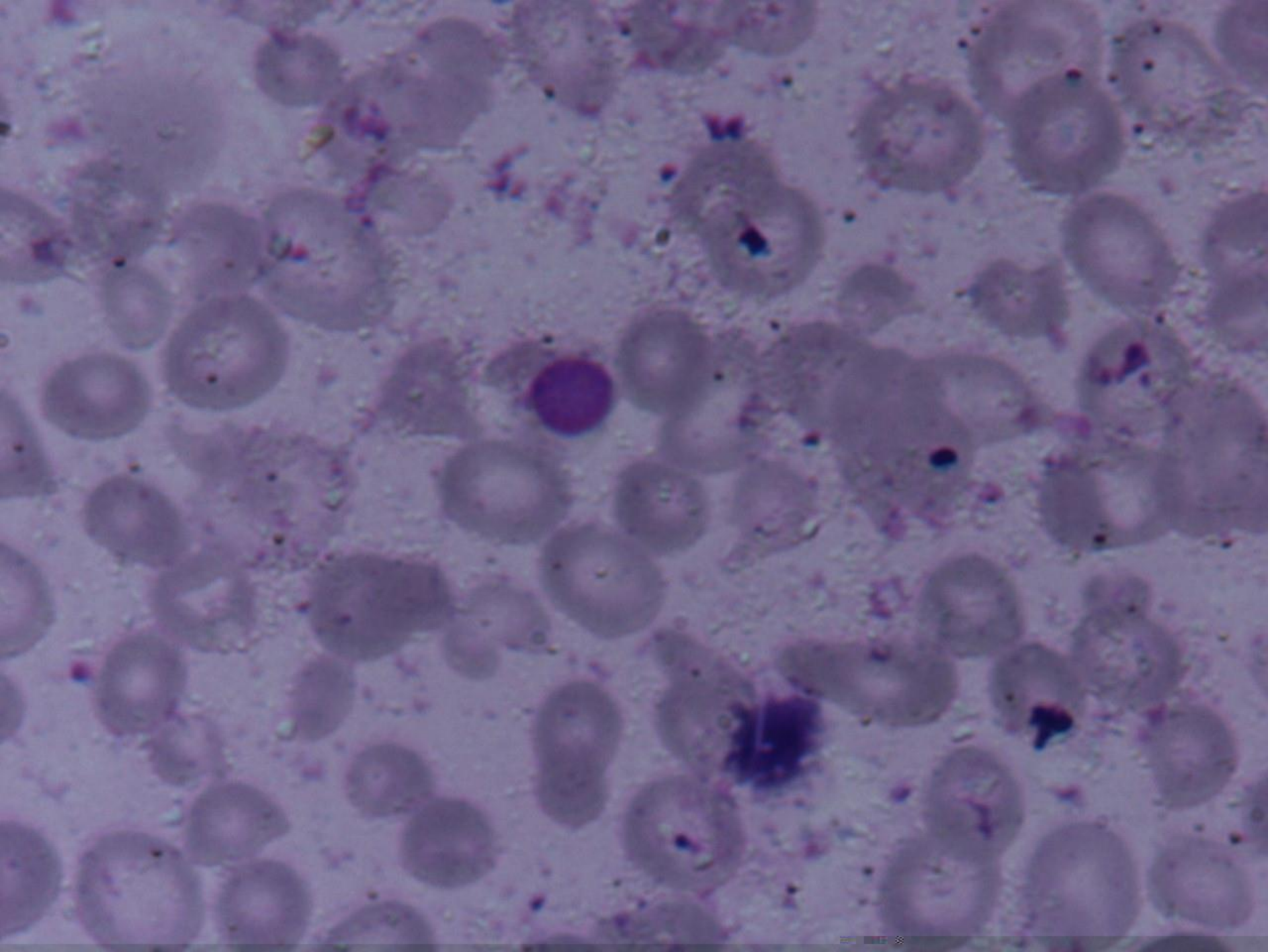
Blood film:

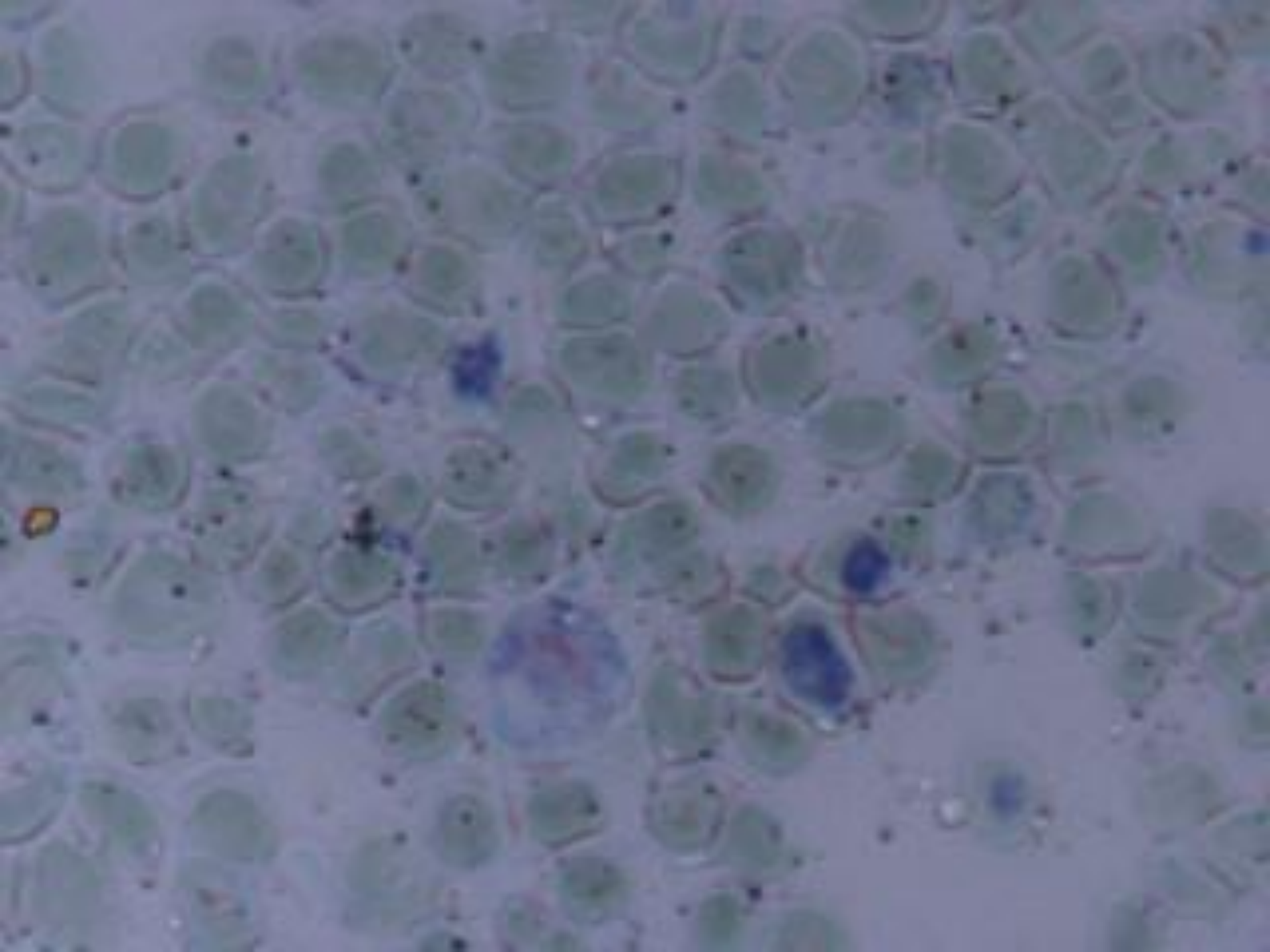
- RBC: hypochromic microcytic with marked anisopoikilocytosis &oval macrocyte, few contracted cells, tear drop and occasional normoblast .
- WBCs: all are mature.
- Platelets: adequate in film.

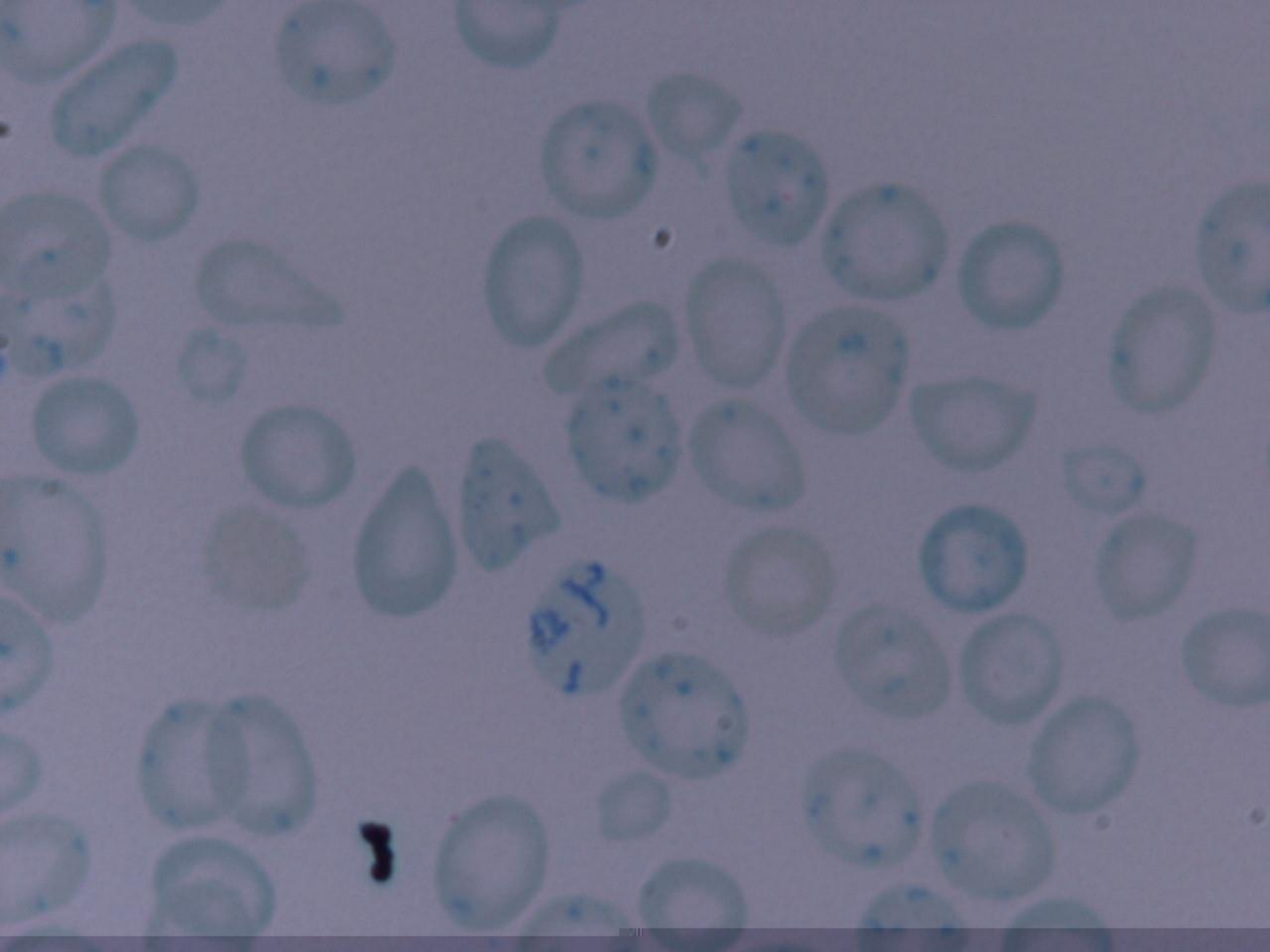


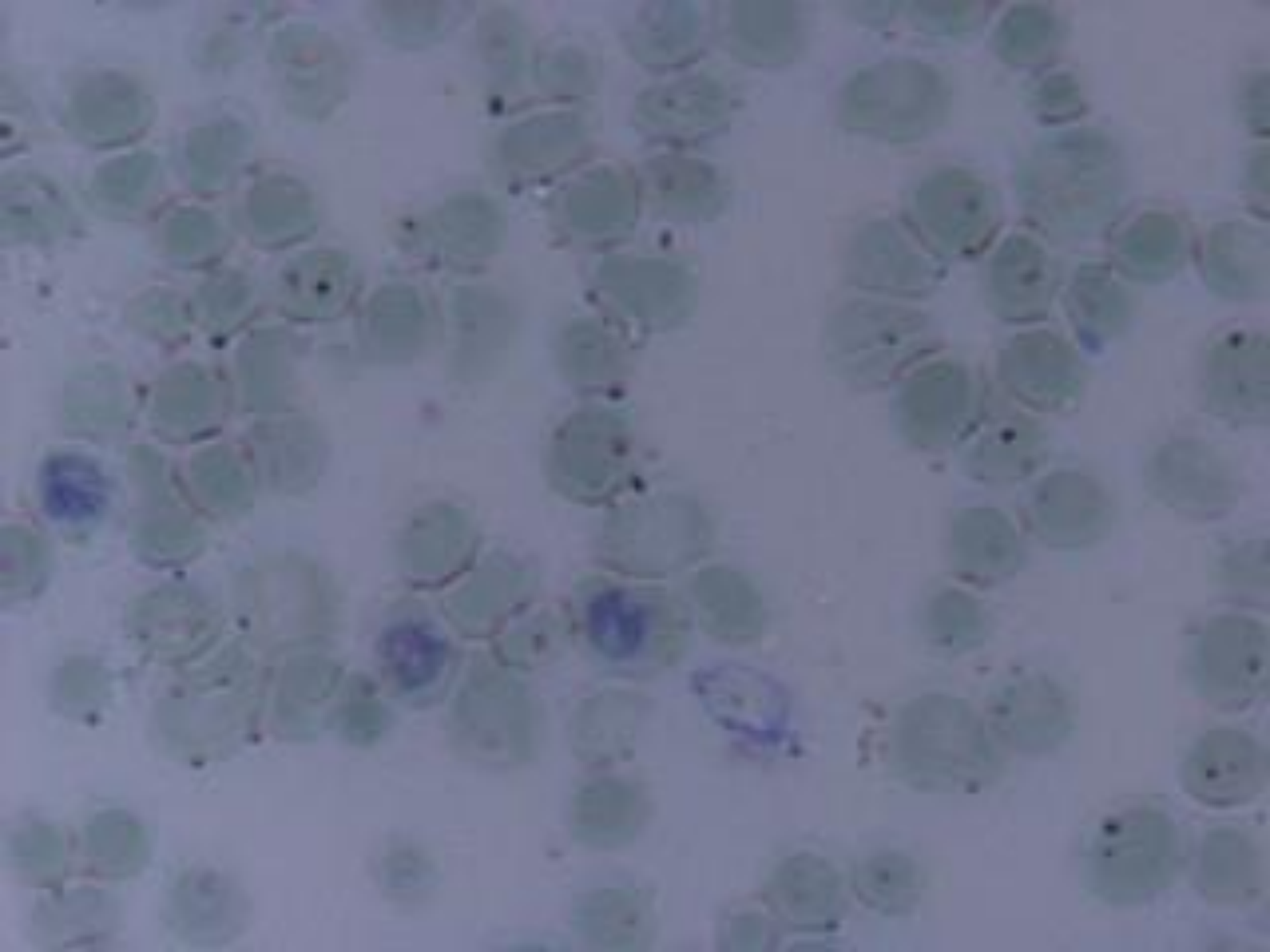












Coagulation screen

PT Test : 15 sec

Control : 13 sec

INR: 1.5

APTT Test : 30 sec

Control : 30 sec

Osmotic fragitity test:

shift to left:

(I .e) the fragility of the patient RBC`s is reduced compared with that of control .

HAM's test

Negative (-ve)

Direct coomb`s test

Negative (-ve)

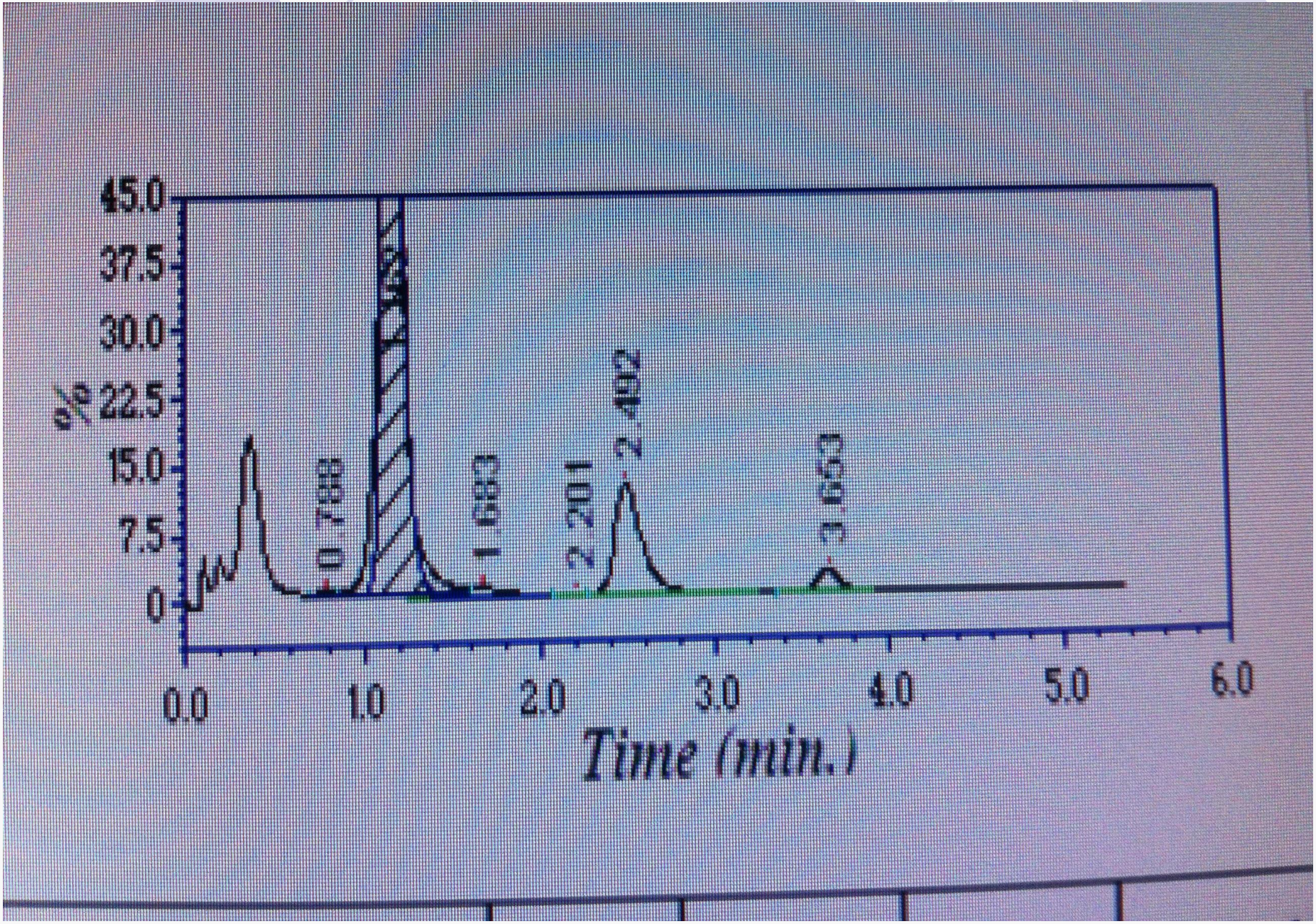
Met_hemoglobin redction test(MRT) (G6PD deficiency screening test)

(+ve) POSITIVE

Hb variant of patient:

- Hb A 11.6 %
- Hb F 86.0 %
- Hb A_2 2.4 %

Comment: homozygous B+_thalassaemia


45.0
37.5
30.0
22.5
15.0
7.5
0
0.0
1.0
2.0
3.0
4.0
5.0
6.0
Time (min.)

ment #1]

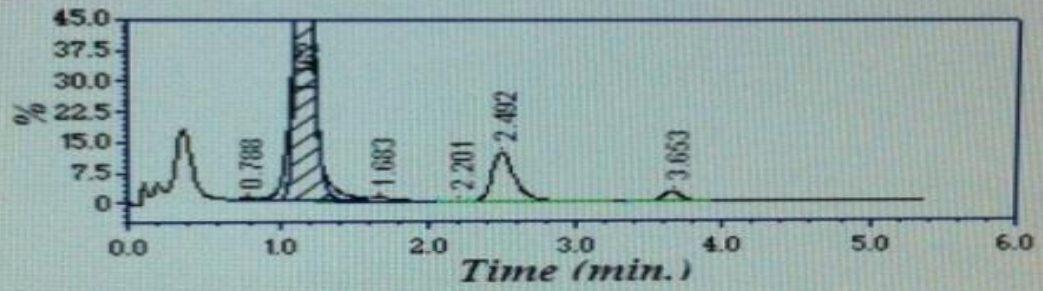
View Run | View Sample | QC Data

e button and pull down. Click the right button to restore.

Instrument # 1 Run Number: 14 Test Name: V2_BThal

Inj #	RackID	Type	Sample ID / Lot Number	Injection Time
1052	0001	P	Unknown-1-1052	22:44:14
1053	0001	P	Unknown-1-1053	22:50:52
1054	0001	P	Unknown-1-1054	22:57:30

☐ Expand
☐ Original
☐ Auto Scale



Reanalysis

Export to LIMS

Peak Name	RT	Area	Area %	Concentration
P1	0.788	4572	0.2	
F	1.162	1837594		86.0*
P3	1.683	19632	0.9	
Unknown	2.201	1689	0.1	
Ao	2.492	304407	13.7	
A2	3.653	52735		2.4

Family study:

Hb variant of father:

- Hb A 91.6 %
- Hb F 2.6 %
- Hb A_2 5.8 %
- Comment: B_thalassaemia triat (heterozygous).

Hb variant of mother:

- Hb A 90.7 %
- Hb F 3.9 %
- Hb A_2 5.4 %
- Comment: B_thalassaemia triat (heterozygous).

Hb variant of her brothers &sister :

Fatima hussen

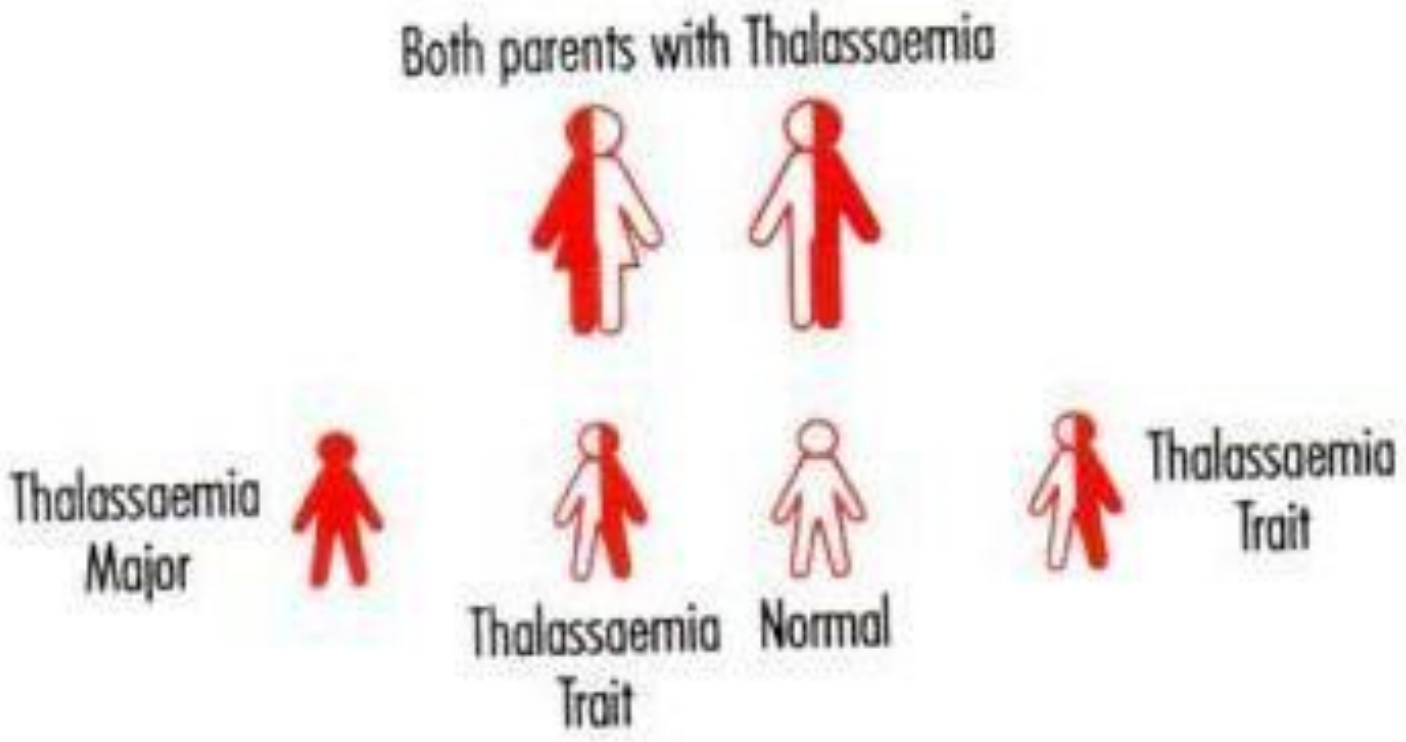
- Hb A 88.6 %
- Hb F 5.9 %
- Hb A_2 5.5 %
- Comment:
  B_thalassaemia triat (heterozygous).

Salleh hussen

- Hb A 90.8 %
- Hb F 3.8 %
- Hb A_2 5.4 %
- Comment:
  B_thalassaemia triat (heterozygous).

Mustafa hussen

- Hb A 95.1 %
- Hb F 1.5 %
- Hb A_2 3.4 %
- Comment:
  Normal Hb Variant


Both parents with Thalassaemia
Thalassaemia Major
Thalassaemia Trait
Normal
Thalassaemia Trait

The β thalassaemias

The β thalassaemias are a group of conditions resulting from a reduced rate of synthesis of β globin. More than 200 β thalassaemia mutations have been recognized, occurring in a wide range of ethnic groups. β thalassaemia is common around the Mediterranean, in the Indian subcontinent and in South-East Asia and relatively common in those of Africa.

β thalassaemia intermedia

β thalassaemia intermedia refers to a clinical phenotype with diverse genetic explanations. In comparison with a typical patient with β thalassaemia trait, there are significant clinical problems, such as anaemia, splenomegaly, leg ulcers and bony deformity.

The condition differs from thalassaemia major in that the patient is not dependent on regular blood transfusions for survival, although transfusions may be needed occasionally, e.g. during intercurrent infection, or may become necessary later in life. The severity of β thalassaemia intermedia varies from a condition in which survival without transfusion is barely possible, and there is growth retardation and bony deformity, to a much milder condition that resembles β thalassaemia trait, but has a greater degree of anaemia and splenomegaly.

Laboratory features

The blood film shows features similar to those of typical β thalassaemia trait, but the abnormalities are more severe. In addition to hypochromia ,microcytosis ,anisocytosis, poikilocytosis and basophilic stippling, there may be polychromasia and circulating erythroblasts.

The findings on haemoglobin electrophoresis or HPLC are dependent on the precise % of underlying genetic defect. The haemoglobin A_2 is likely to be elevated somewhat more than in β thalassaemia trait and the haemoglobin F is elevated. The bone marrow aspirate shows abnormalities of erythropoiesis that are more sever than those of β thalassaemia trait.

CLINICAL

	Major	Intermedia	Minor
Hemoglobin (g %)	<7	7–10	>10
Reticulocytes (%)	2–15	2–10	<5
Nucleated RBC	++++–+	+–0	0
RBC morphology	++++	++	+
Jaundice	++	+0	0
Splenomegaly	+++	+	0
Skeletal changes	+++–++	+–++	0
Transfusion	+++–+	+–0	0

GENETIC

HOMOZYGOUS

HETEROZYGOUS

INTERACTIONS WITH THALASSEMIA VARIANTS

HEMOGLOBIN H SYNDROMES

INTERACTIONS WITH ABNORMAL HEMOGLOBINS

Clinical and genetic characteristics of thalassemia syndromes.

Manifestation of thalassaemia

	MAJOR	INTERMEDIA	MINOR
Clinical	**Onset in Infancy**	**Later Onset**	**Asymptomatic**
Splenomegaly	++++	+++–++++	0–+
Jaundice	+++	+–+++	0–+
Bone changes	++++	++–++++	0
Facial changes	++–++++	0–++++	0
Hematologic			
Anemia	++++	++–+++	0–+
RBC	↓	↓	N – ↑
Microcytosis	+	+	+
NRBC	++–++++	+–+++	0
Biochemical			
HbF	10–95+%	10–95+%	N or <10%
HbA_2	N or ↑	N or ↑	N or ↑ (>3.5%)

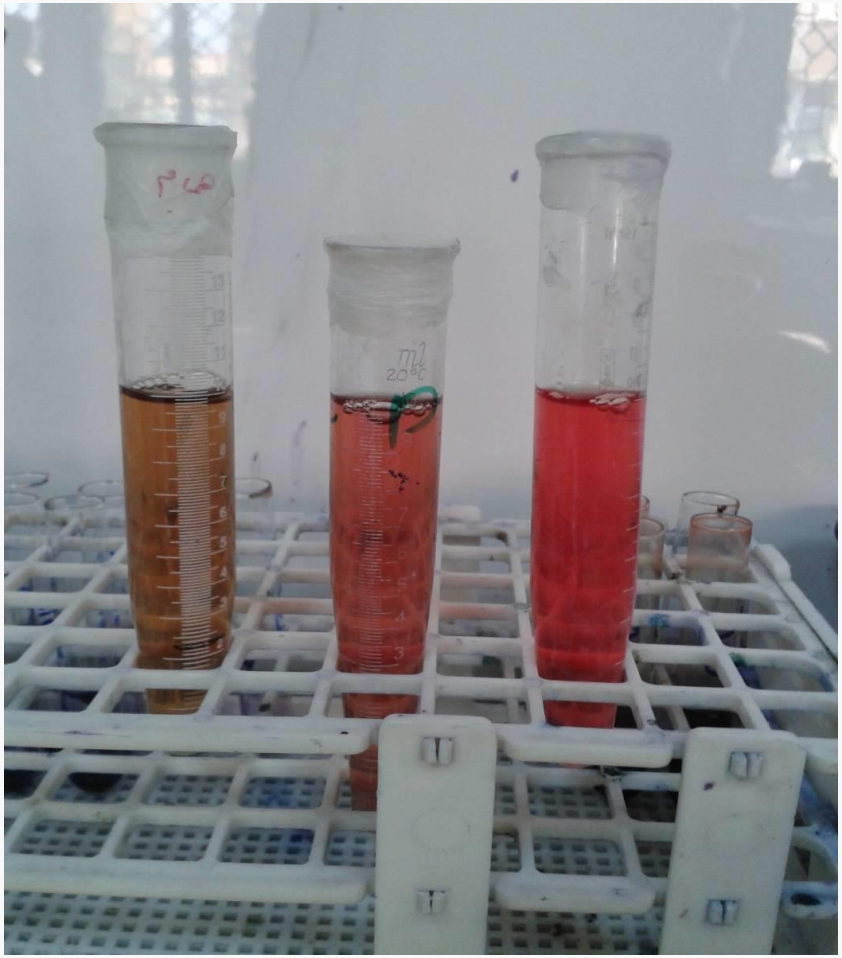
Classification, Clinical & Hematological features of ß Thalassemia :

Syndrome	Clinical Features	Hemoglobin Pattern	ß-globin genes affected and genotype
◆Heterozygous State –Silent Carrier	◆No Anemia, normal	◆Normal, ◆HbF < 5%	1 $ß^+$ / A
–Thalassemia trait	◆Mild anemia, hypochromic, microcytic red cells ◆Hb ≥ 10 gm% ◆RBC > 5.5 x 10^{12} per liter	◆ Elevated HbA2 (3.6-8 %)	1 $ß^0$ / A, $ß^+$ / A
◆Homozygous State –Thalassemia Intermedia	◆Moderate anemia, **requires some transfusion** ◆ Hb ≥ 7-10 gm% ◆RBC < 5.5 x 10^{12} per liter	◆ HbF elevated(20 - 100 %) ◆HbA2 < 3.5 %	2 $ß^+$ / $ß^+$
–Thalassemia Major or Cooley's Anemia	◆ Severe anemia, **transfusion dependent** ◆Hb < 7 gm% ◆RBC < 4 x 10^{12} per liter	◆ HbF elevated (90%) ◆HbA2 = 2% ◆HbE = 30-40%	2 $ß^0$ / $ß^0$, $ß^0$ / $ß^+$, E / $ß^0$

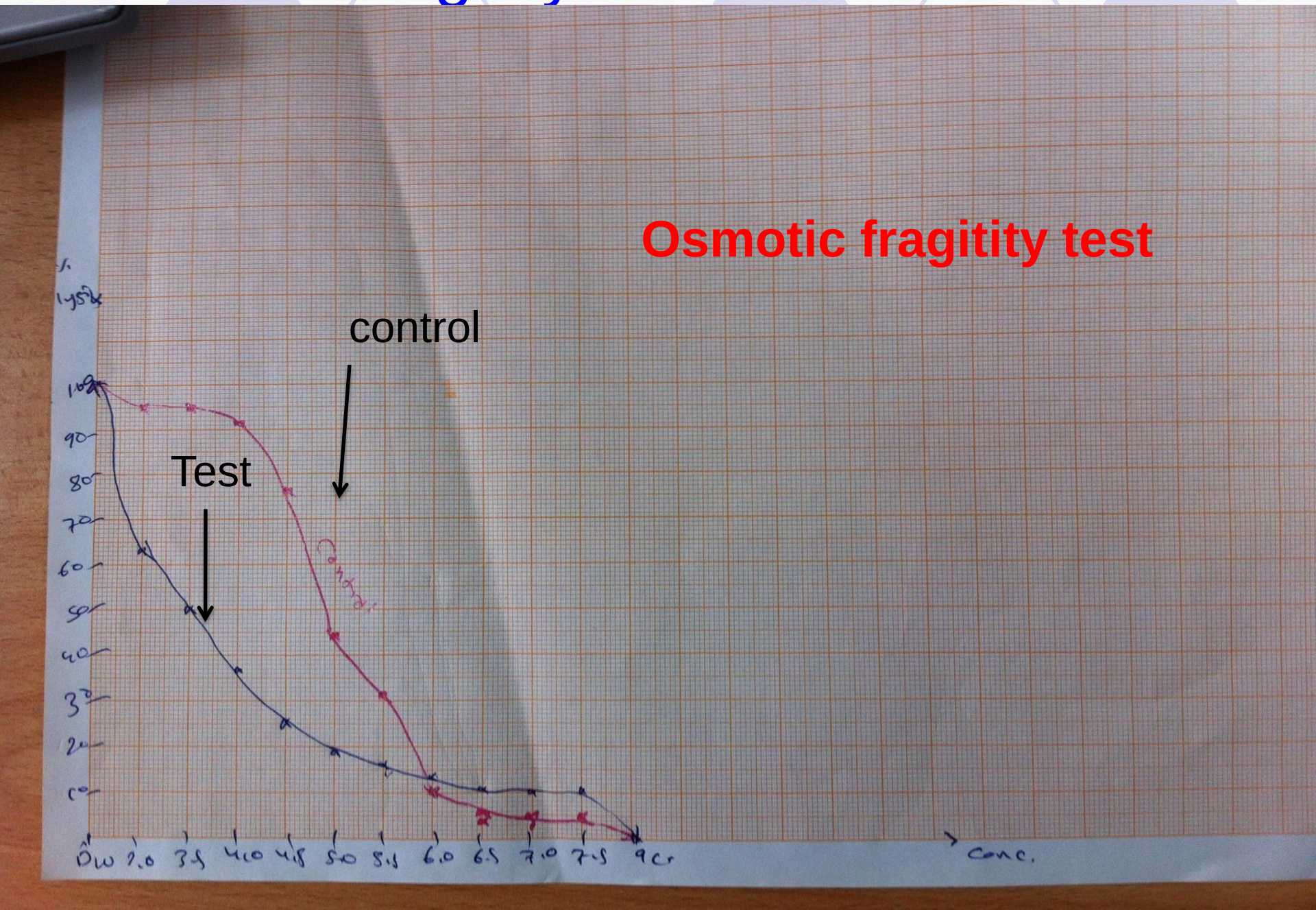
Because of the significant overlap in clinical severity among the 3 types of β thalassemia and despite the fact that several genotypes are associated with the β thalassemia intermedia picture, the diagnosis continues to be a clinical one, regardless of the genotype involved.

Moreover, in an individual patient, the diagnosis may change from thalassemia intermedia to thalassemia major once the patient begins to have more severe symptoms and to require regular blood transfusions.


THANK YOU



Osmotic fragitity test



Criteria used to define Thalassemia intermedia including:

1. Age of presentation.
2. Hemoglobin or fetal hemoglobin level.
3. Transfusion independence.