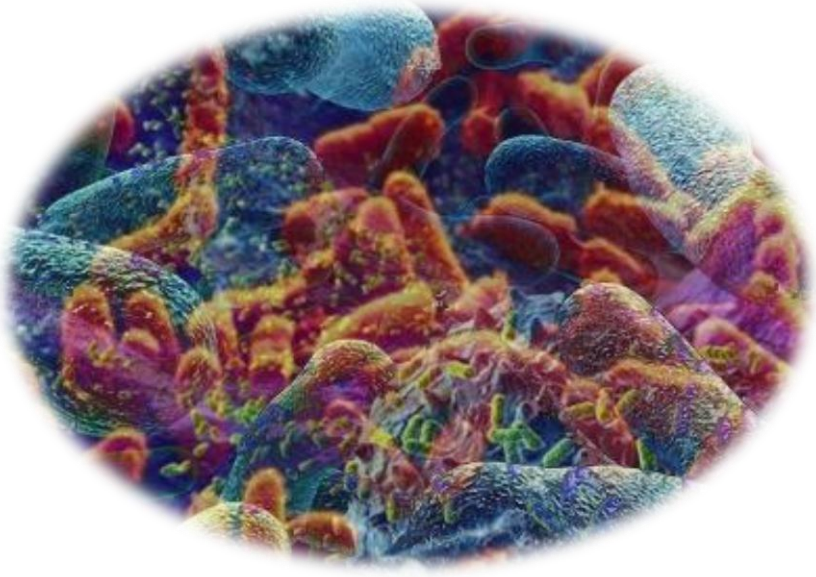
431 Microbiology Team

Practical File 2: Parasitology

GIT & HAEMATOLOGY BLOCK



LEADERS

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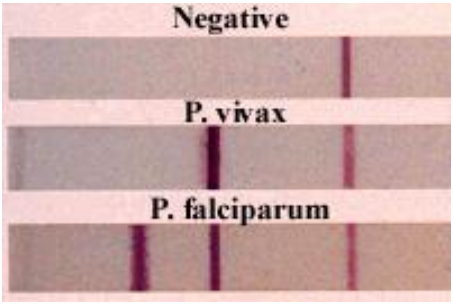
DONE BY

Faisal Al Rashed

431 Microbiology Team
Parasitology Practical

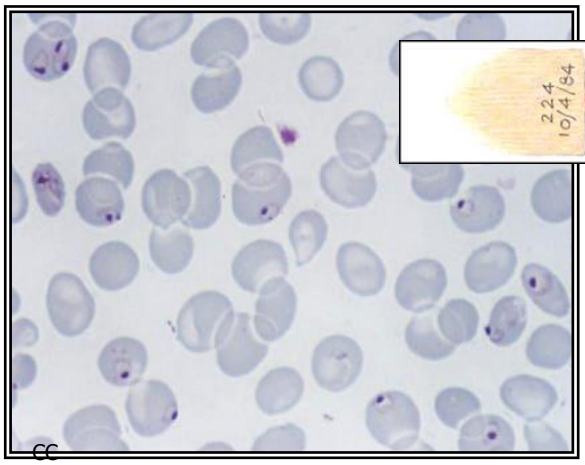
2 common ways to diagnose malaria:

1. Light Macroscopy.
2. Rapid Diagnostic Tests (RDTs): to detect malaria antigens.
    a. Plastic Cassettes.
    b. Card.
    c. Dipstick.
    d. Hybrid Cassette-Dipstick.

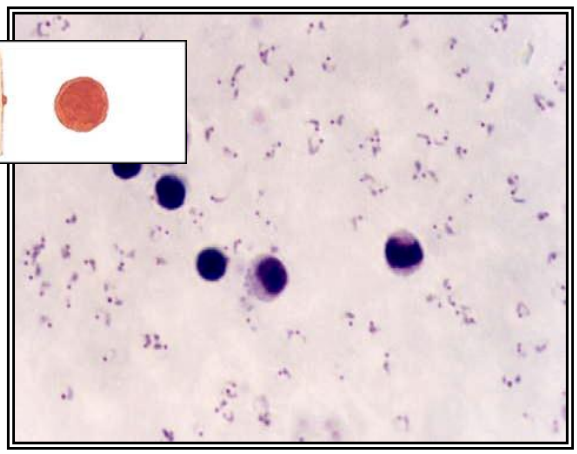


Light Microscopy:

Thick and thin blood films:



Plasmodium falciparum (trophozoite stage in thin smear)



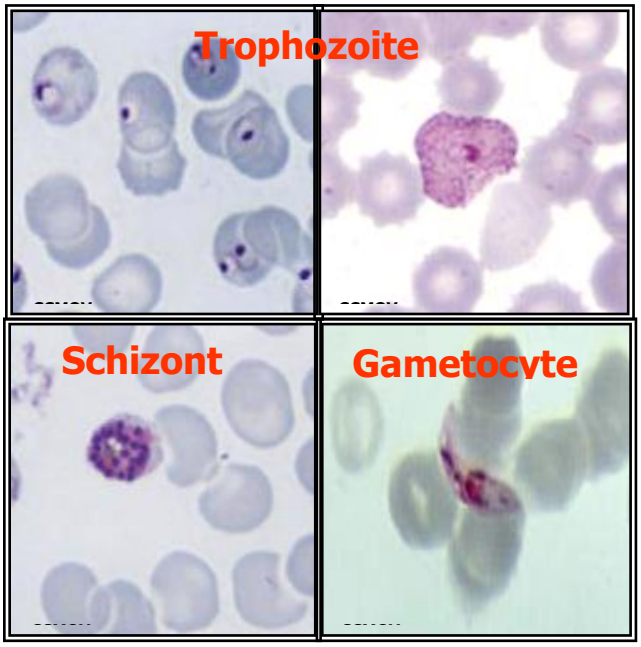
Plasmodium falciparum (trophozoite stage in thick smear)

Three developmental stages seen in blood films:

1. Trophozoites.
2. Schizonts.
3. Gametocytes.

Features of Plasmodium:

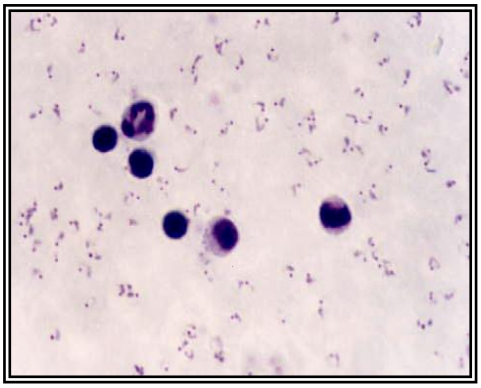
1. Vacule.
2. Nucleus / Chromatin Dot.
3. Cytoplasm.
4. Stippling.



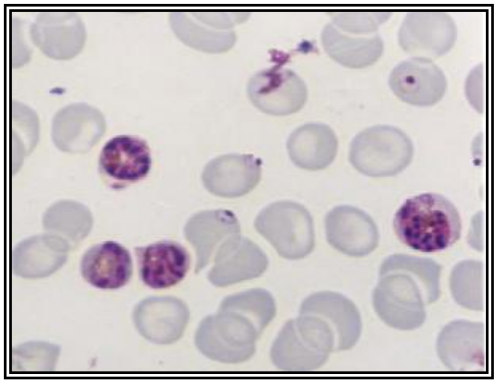
Diagnostic Points

Trophozoite	Plasmodium Falciparum	**Small, regular**, fine to fleshy cytoplasm Infected RBCs are **NOT** enlarged Ring, comma. Often have double chromatin dots. Multiple infection is common.
	Plasmodium Vivax	Infected red cells usually **enlarged**, Irregular (**Amoeboid**) cytoplasm with large rings. Schuffner's dots (stippling) are frequently visible
	Plasmodium ovale	Smaller than Vivax, Few, Ring to rounded. Make the infected RBC **oval** in shape
	Plasmodium Malariae	Infected RBCs are **NOT** enlarged. **Band** forms are seen. Small, few, Ring to rounded, Compact, Vaculated or non-Vaculated.
Schizont	Plasmodium Falciparum	Small, Single dark pigment, **Rarely fill the RBC.** 16-32 or more merozoites in compact cluster.
	Plasmodium Vivax	**Large**, covering almost or the **entire enlarged RBC.** Few to moderate.
	Plasmodium ovale	
	Plasmodium Malariae	6-12 merozoites in "**rosette**" formation, but more often in irregular cluster
Gametocyte	Plasmodium Falciparum	**Banana-shaped** or rounded. Macrogametocyte: small, compact, central chromatin dot, pigments closely adhere to the chromatin. Microgametocyte: broader, shorter. Loosely scattered chromatin.
	Plasmodium Vivax	Round and Large.
	Plasmodium ovale	
	Plasmodium Malariae	

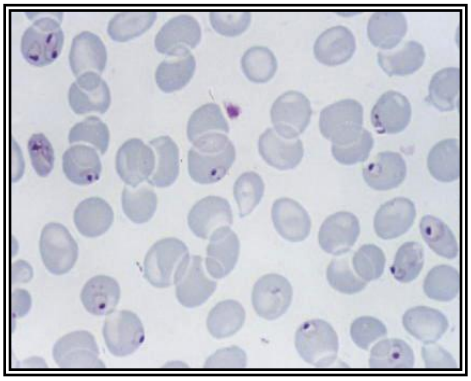
Epidemiology	Plasmodium Falciparum	Mostly in Africa
	Plasmodium Vivax	South east Asia (India, Thailand…)
	Plasmodium Ovale	Reported in Philippines
	Plasmodium Malariae	
	Mixed infections	Endemic areas like Philippines



Falciparum Trophozoits in thick smear

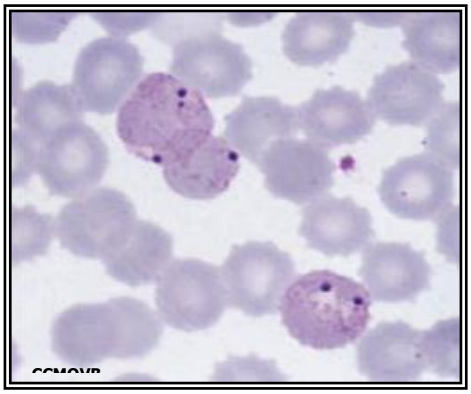


Falciparum trophozoites and schizonts in thin smear

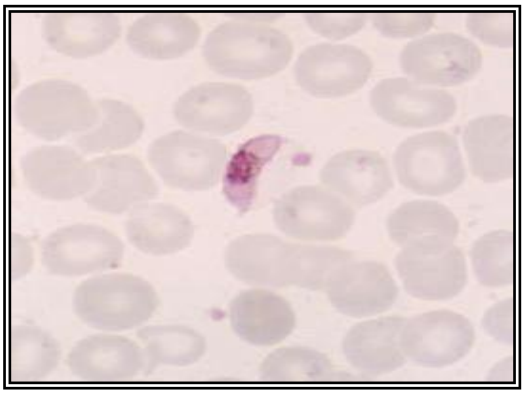


Falciparum Trophozoites in thin smear

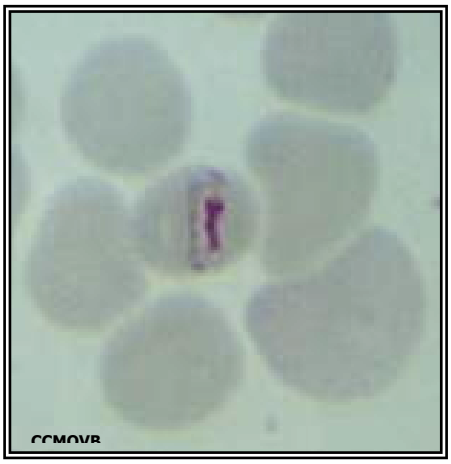
Vivax



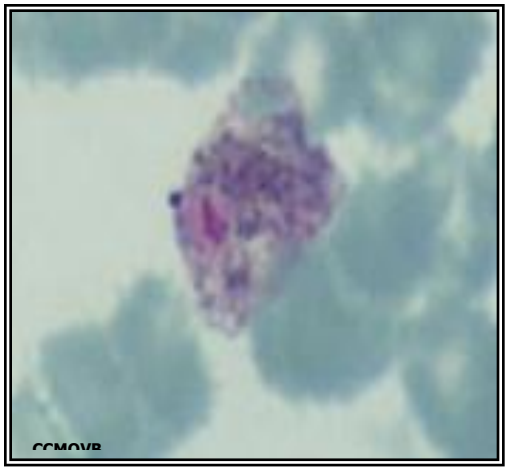
Plasmodium Vivax



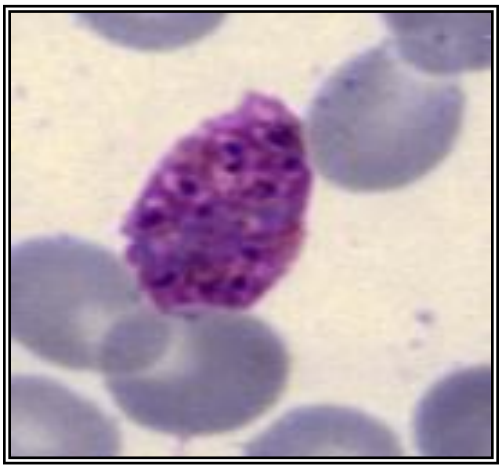
Falciparum Gametocyte



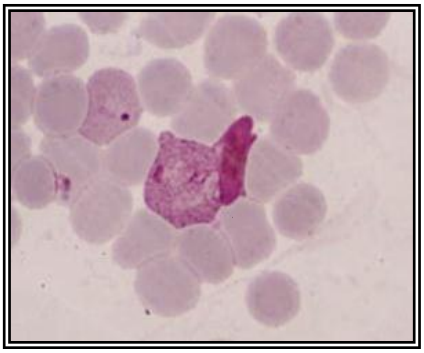
Plasmodium Malariae trophozoites



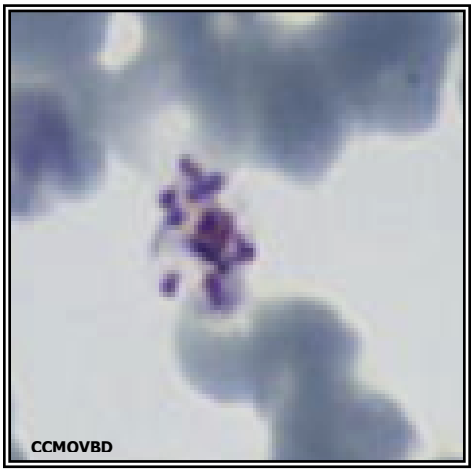
Vivax Gametocyte in thin Smear



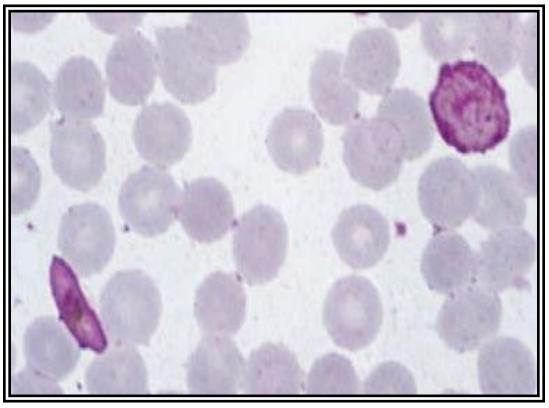
Vivax Schizont Stage



Mixed Infections



Plasmodium malariae (schizont stage)
Thick Smear
(note the Rossete)

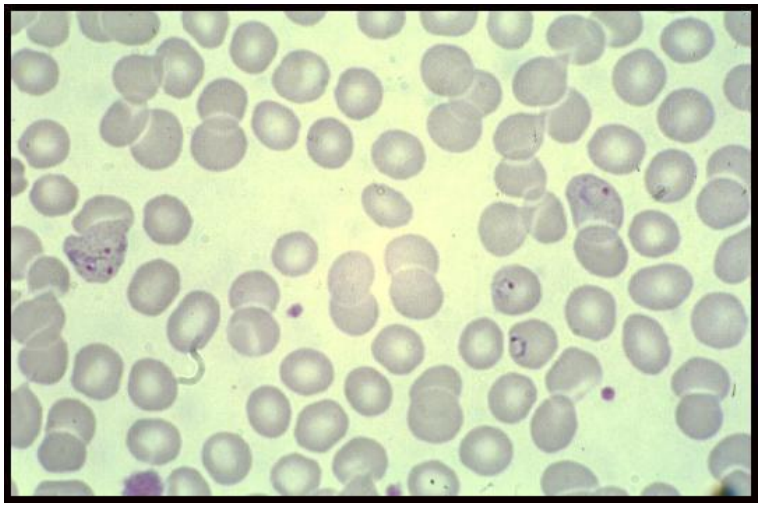


Falciparum Gametocyte, Vivax Schizont
Mixed

Cases

Case 1

A 25 year-old male from India, who came 3 months ago was admitted in KKUH with a history of severe anaemia and intermittent high grade fever for the last two months not responding to antibiotics.



WHAT IS THE DIAGNOSIS?

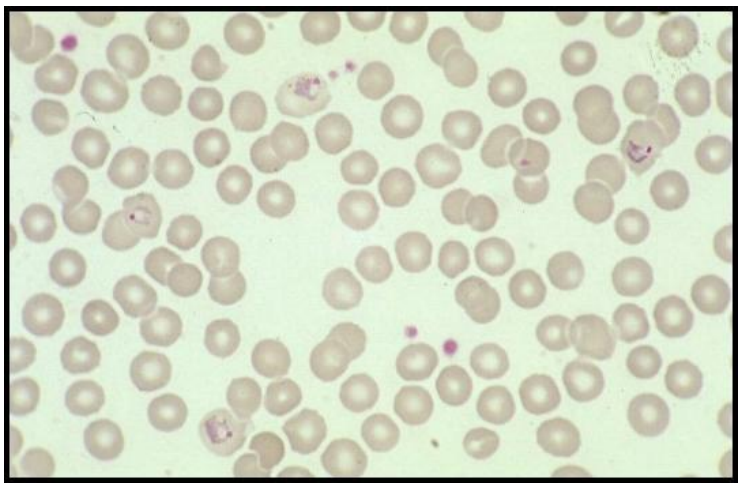
Diagnosis: **Plasmodium vivax "Malaria"**

Describe What you see?

Thin Blood smear showing enlarged distorted RBCs with distorted ring formation. [Enlarged RBCs infected with malaria].

Case 2

A businessman who makes frequent trips to Thailand, presents with intermittent fever.



WHAT IS THE DIAGNOSIS?

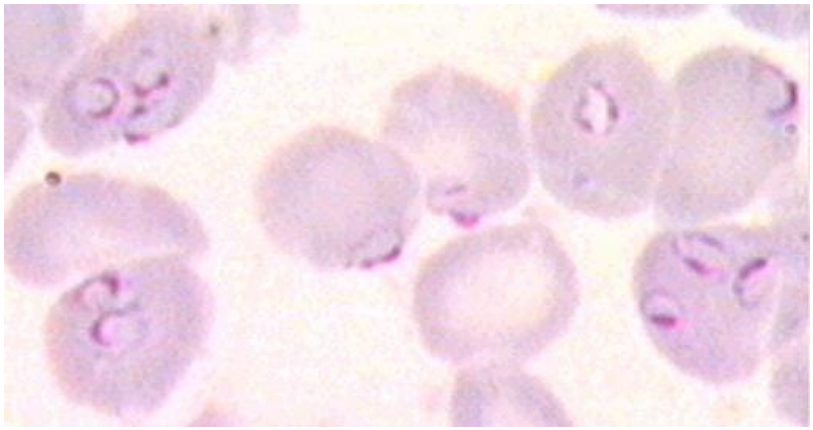
Diagnosis: **Plasmodium vivax "Malaria"**

Describe What you see?

Thin Blood smear showing enlarged distorted RBCs with distorted ring formation. [Enlarged RBCs infected with malaria]

Case 3

A student in KSU who returned three weeks from vacation in Africa, he developed intermittent fever last week and lost consciousness a short time ago.



WHAT IS THE DIAGNOSIS?

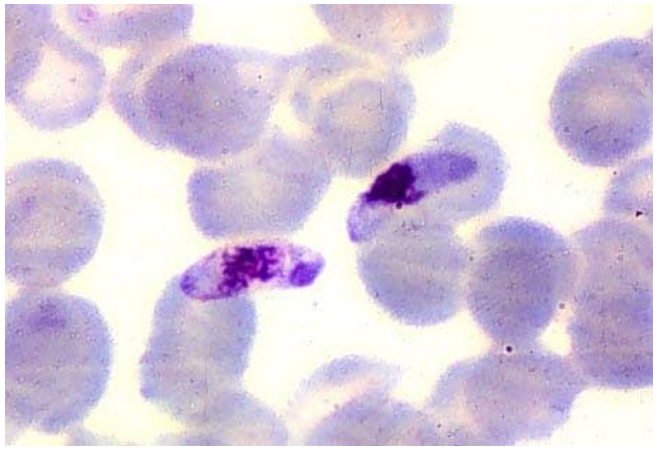
Diagnosis: Plasmodium Falciparum.

DESCRIBE WHAT YOU SEE

Thin blood smear showing RBCs with **multiple rings** formation.

Case 4

The patient was then treated with schizontocidal antimalarial drugs, a follow-up blood film is shown .



ARE THERE ANY PARASITES? WHAT STAGE ?

Plasmodium falciparum, gametocyte stage.

DESCRIBE WHAT YOU SEE

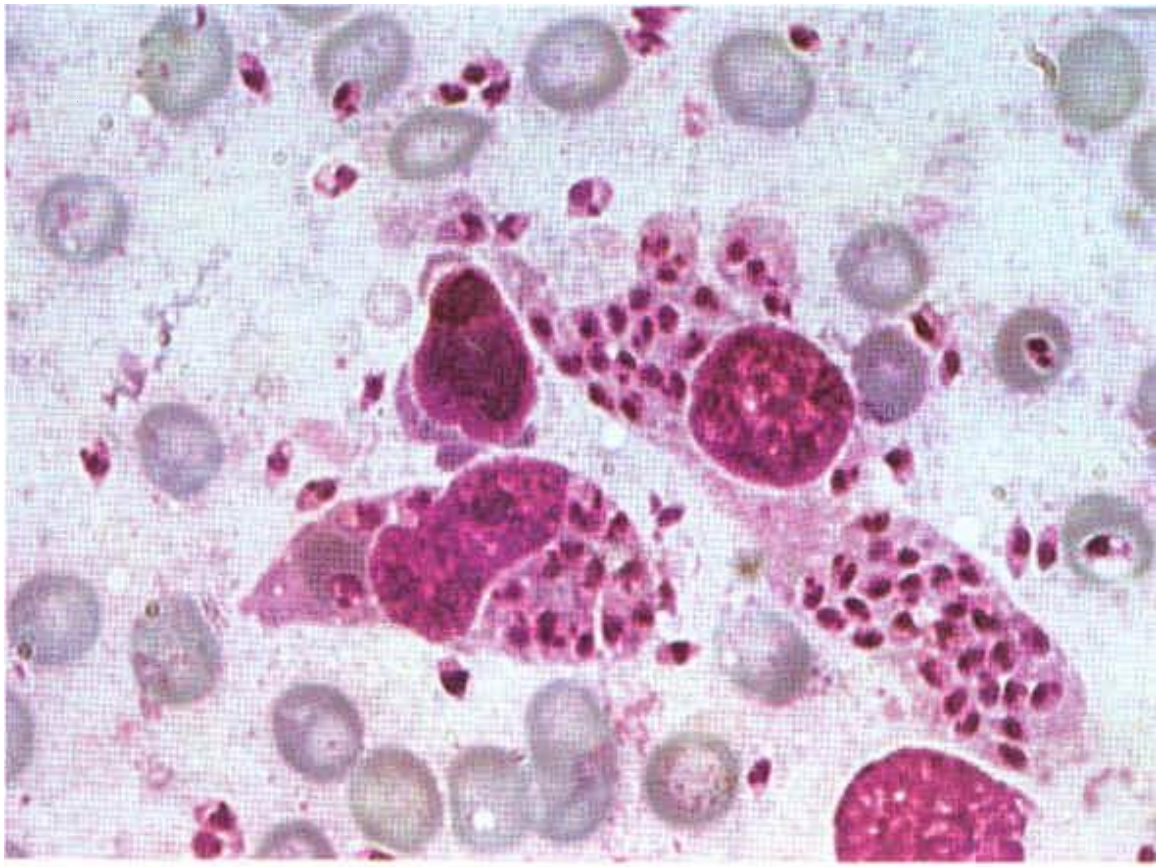
Thin blood smear showing Banana Shaped RBCs.

WHAT IS THE BEST TREATMENT FOR THIS CASE?

Primaquine (gametocidal).

Case 5

A 7 year old child presented with anemia, hepatospenomegaly and fever .Not responding to antimalarials and antibiotics. Bone marrow smear is shown



ARE THERE ANY PARASITES? WHAT STAGE?

Leishmania, amastigote stage