

Practical

Malaria and Leishmania



Microbiology Team 430

Done By:

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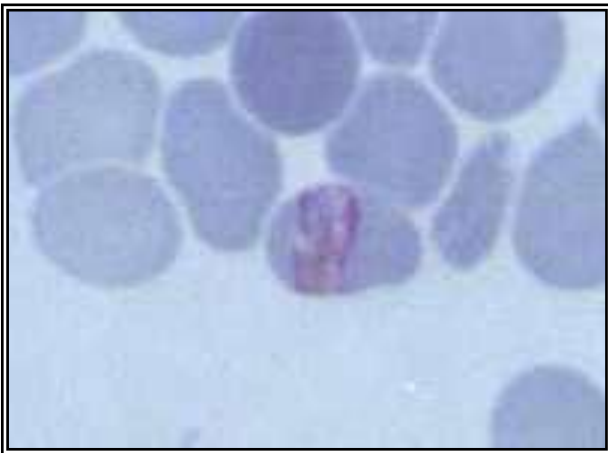
Ghadeer Alwuhayed

The two used common methods for parasitological diagnosis of malaria:

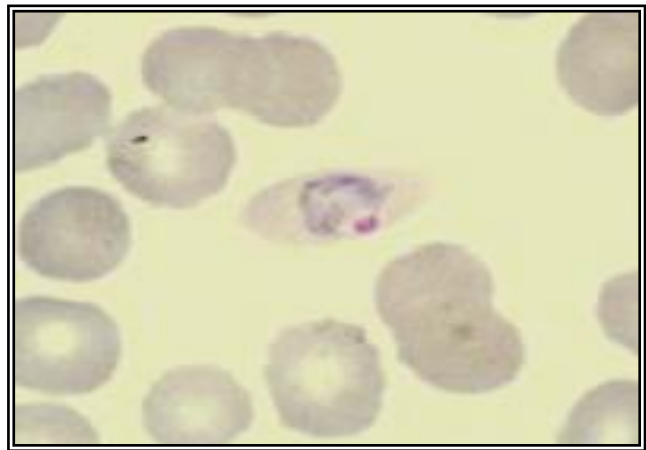
- 1) **Light microscopy** → blood film examination
- 2) **Rapid diagnostic tests (RDTs)** → detects malaria antigens.

There are three stages of plasmodium species:

- 1- **Trophozoite stage** : each species has different morphology
 - *Plasmodium vivax* → infected RBC is **enlarged, maebooid and has granules**.
 - *Plasmodium falciparum* → **Multiple** ring formation with **chromatin** dots (infected RBCs are **not enlarged**).
 - *Plasmodium malariae* → **Band** formation in RBCs
 - *Plasmodium ovale* → Make the **RBCs oval** in shape
- 2- **Schizont stage**: all are the same → many dots in the RBCs.
- 3- **gametocyte stage** [**characteristic in *Plasmodium falciparum*** → **banana- shaped RBCs**



Plasmodium malariae-trophozoite stage
Band formation in RBCs.

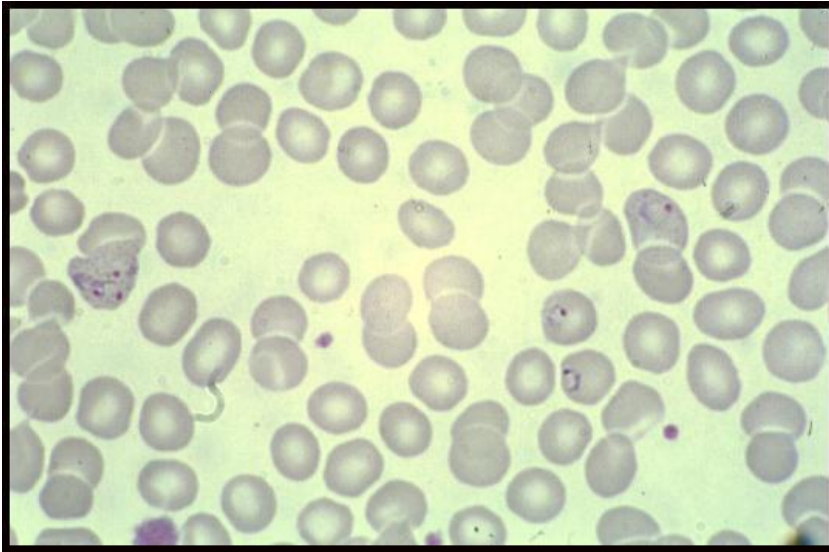


Plasmodium ovale- trophozoite stage
Make the RBCs oval in shape.

Case 1

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

WHAT IS THE DIAGNOSIS?

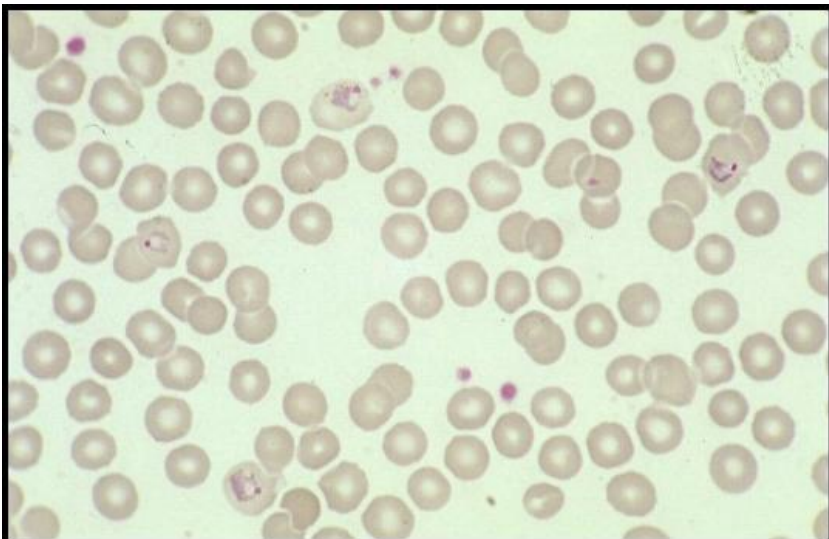


- Thin Blood smear showing enlarged distorted RBCs with distorted ring formation.
[Enlarged RBCs infected with malaria]
- Diagnosis: Plasmodium vivax

Case 2

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

WHAT IS THE DIAGNOSIS?

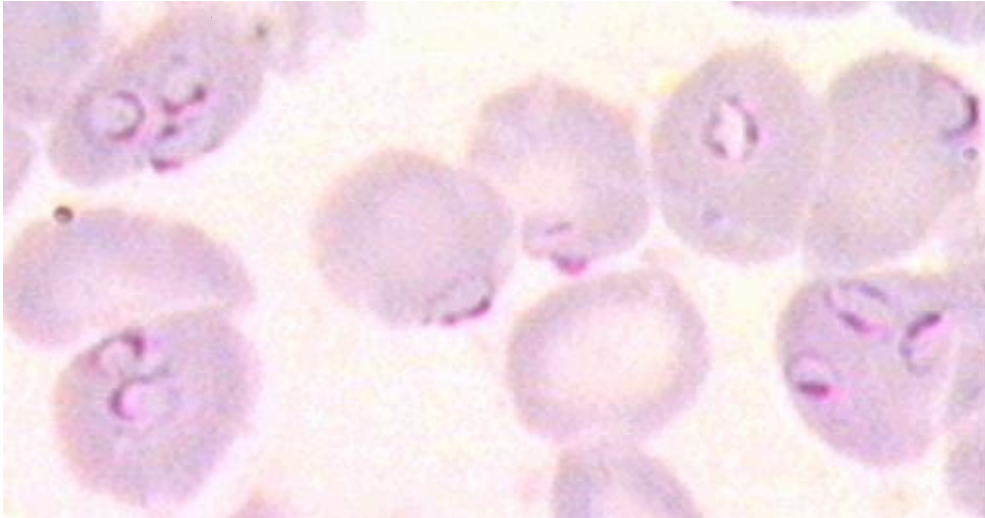


- Thin Blood smear showing enlarged distorted RBCs with distorted ring formation.
[Enlarged RBCs]
- Diagnosis: Plasmodium vivax

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.

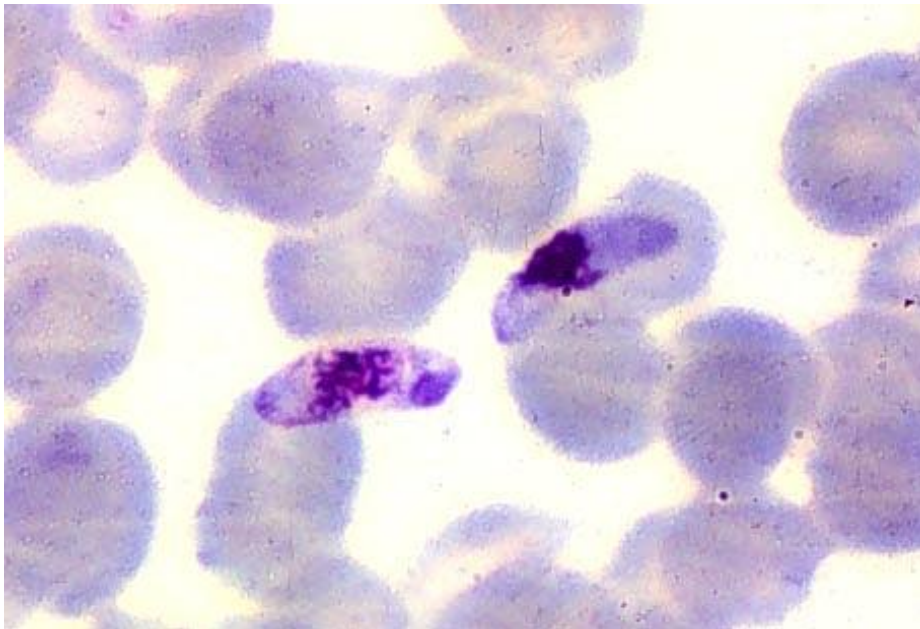
WHAT IS THE DIAGNOSIS?



- Thin blood smear showing RBCs with **multiple rings** formation.
- **Diagnosis: Plasmodium falciparum**
due to; 1. Loss of consciousness. 2. Heaviness infection.

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

ARE THERE ANY PARASITES? WHAT STAGE?



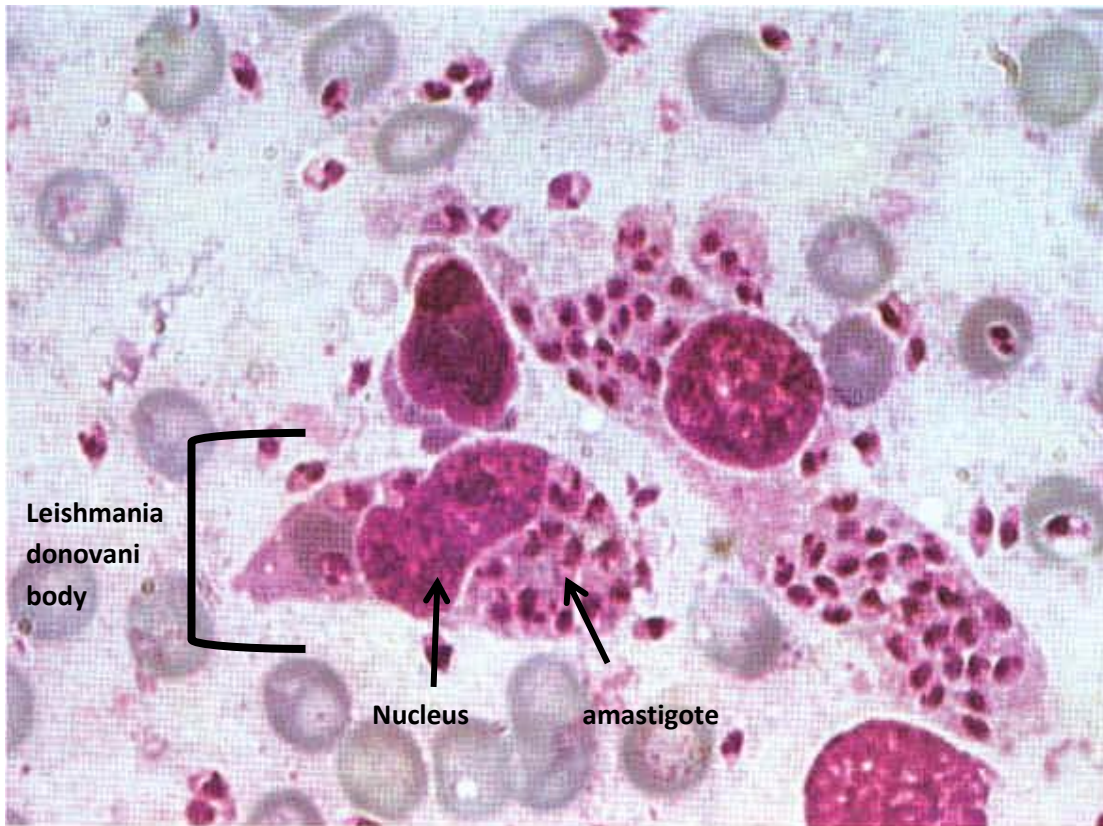
Thin blood smear showing banana- shaped RBCs. **Diagnosis** → Plasmodium falciparum , **gametocyte stage**

The patient still has malaria after taking antimalarial drugs, because the drugs are not working on the gametocytes stage.

Case 4

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

ARE THERE ANY PARASITES? WHAT STAGE?



- Parasite: Leishmania
- Stage: **amastigote stage** (organism is ova 2-3 microns in diameter nucleus + kinetoplast)
- Diagnosis: visceral Leishmaniasis

Leishmaniadonovani bodies (L.D bodies) (amastigote of leishmania inside the macrophage)
[Macrophages infected with Leishmania]

The smear is taken from bone marrow not from peripheral blood.

Notice the nucleus of macrophage (RBCs do not have nucleus).