

Marrow and blood smear review still saves lives

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CASE REPORT

A 62-year-old woman arriving to Miami, Florida, USA, on a commercial flight from Italy was found unresponsive upon landing. Her husband, seated next to her, arrived deceased. The female patient was brought urgently to our hospital. Physical examination showed ecchymosis and edema of limbs. Laboratory tests revealed thrombocytopenia of 88 K/uL, white blood count of 11.9 K/uL, hemoglobin of 6.9 g/dL, mean corpuscular volume of 82 fL, hypotension, acute renal failure, and fever (101.4 °F). Bone marrow biopsy was performed urgently and aspirate smears were stained and reviewed immediately upon admission of the patient. Examination of marrow aspirate smears revealed abundant hemozoin pigment and frequent hemophagocytosis (Figure 1A, B, 100x magnification). Florid infection of red blood cells by malaria trophozoites was seen in both peripheral smears and marrow aspirate smears, with trophozoites having morphologic features consistent with *Plasmodium falciparum* (Figure 2, 100x magnification). A diagnosis of florid infection by *P. falciparum* with extensive hemophagocytosis was made. The patient was treated promptly for cerebral malaria and survived. It was later discovered that she and her husband had traveled to the Ivory Coast to visit family and had felt ill for two weeks.

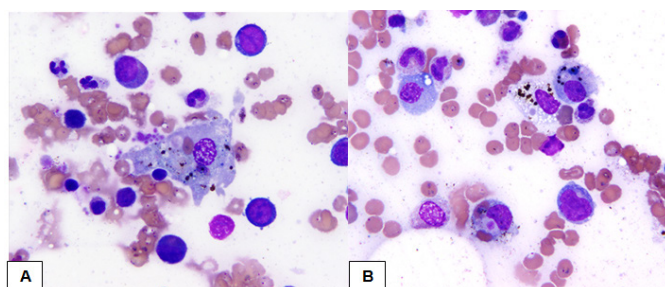


Figure 1: (A) and (B) Bone marrow aspirate smears showing frequent hemophagocytosis and abundant hemozoin pigment deposition. Background red blood cells show infection by *P. falciparum* (Wright–Giemsa stain, 100x magnification).

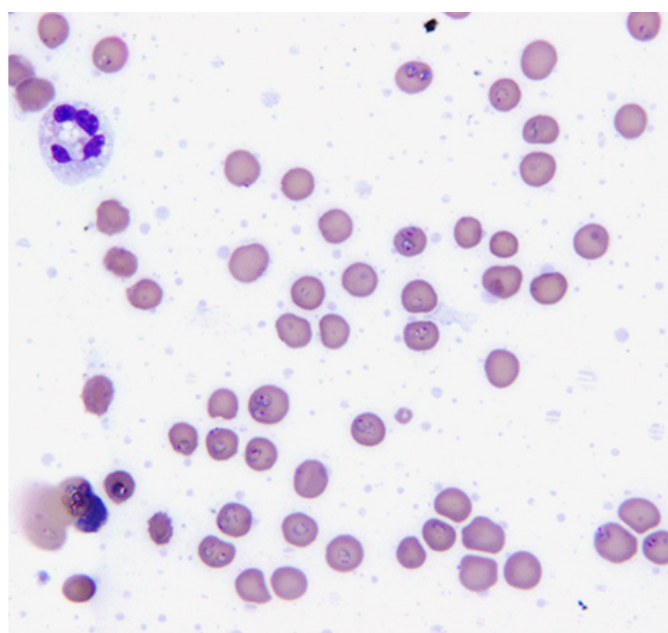


Figure 2: Peripheral blood smear. Florid infection of red blood cells by *P. falciparum* (Wright–Giemsa stain, 100x magnification).

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DISCUSSION

Malaria is a potentially life-threatening parasitic infection of the genus *Plasmodium*. Of more than 150 known species, four infect humans: *P. falciparum*, *Plasmodium vivax*, *Plasmodium ovale*, and *Plasmodium malariae*. The life cycle occurs in two hosts, the vector *Anopheles* mosquito and a vertebrate host. Stages

of development are: sporozoite (transmitted form), merozoite (infects red cells), trophozoite (ring forms, multiply in red cells), and gametocyte (sexual stage). Trophozoites of *P. falciparum* are ring forms with a double chromatin dot that, during infectious states, show frequent multiple ring forms per infected red cell. Infections caused by *P. falciparum* are potentially fatal. Complications include renal failure, acute respiratory distress syndrome, and cerebral malaria [1].

CONCLUSION

Timely bone marrow aspirate smear review is still an important diagnostic tool in hematopathology and acting quickly to identify potentially fatal diagnoses such as *P. falciparum* infection can save lives.

Keywords: Hemophagocytosis, Parasitic infection, *Plasmodium falciparum*

How to cite this article

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Author Contributions

Taban Ghaffaripour – Conception of the work, Design of the work, Acquisition of data, Analysis of data, Interpretation of data, Drafting the work, Revising the work critically for important intellectual content, Final approval of the version to be published, Agree to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved

Jennifer Chapman – Conception of the work, Design of the work, Acquisition of data, Analysis of data, Interpretation of data, Drafting the work, Final approval of the version to be published, Agree to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved

Guarantor of Submission

The corresponding author is the guarantor of submission.

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Written informed consent was obtained from the patient for publication of this article.

Conflict of Interest

Authors declare no conflict of interest.

Data Availability

All relevant data are within the paper and its Supporting Information files.

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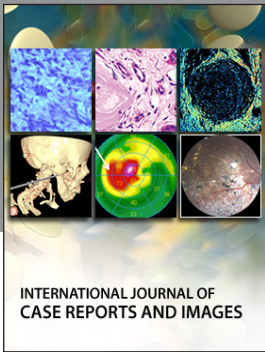
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