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Case Report

Spontaneous rupture of spleen with complicated falciparum malaria in a United Nations Peacekeeper

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We report one such case encountered in our hospital which had a fatal outcome.

Case report

A 28-year-old Egyptian soldier deployed in United Nations Peacekeeping Mission at Democratic Republic of Congo for past 2 months, was evacuated to our institution with history of high-grade intermittent fever for 04 days followed by disorientation and reduced urine output. He was on chemoprophylaxis with weekly Tab Mefloquine 250 mg since entering the region. On admission, patient was febrile, toxic looking, dehydrated, and was disoriented. Icterus with hepato-splenomegaly was also noted. Rapid Parasite Histidine Rich Protein-II antigen (HRP-II Ag) test was found positive and peripheral blood smear (Fig. 1) showed red cells parasitized by *Plasmodium falciparum*, neutrophilic leukocytosis and thrombocytopenia. Other laboratory investigations revealed haemoglobin (Hb) – 10 g/dL, serum bilirubin – 4.3 mg/dL, ALT – 117 IU/dL, urea – 160 mg/dL, creatinine – 3.0 mg/dL, prothrombin time – 24 s (control 12 s). Ultrasound abdomen showed enlarged spleen and liver. He was managed as a case of Severe Complicated falciparum malaria with IV artesunate, antibiotics and supportive care. Initially he responded to the therapy and regained consciousness and increase in urine output to more than 50 ml/h. However, on second day of admission, he suddenly developed

Introduction

Globally, malaria is endemic in over 106 countries according to World Health Organization (WHO) World Malaria Report 2011. Despite the availability of sensitive rapid diagnostic tests and a host of antimalarial drugs, it contributed to 655,000 deaths in 2010, of which 91% were in Africa with falciparum malaria as the major contributor. Usually, complications like cerebral malaria, acute renal failure, thrombocytopenia and abnormal coagulation are seen in falciparum malaria, but spontaneous rupture of spleen is an extremely rare entity with very few published case reports.^{1,2}

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Fig. 1 – Plasmodium falciparum infection (Leishman Giemsa stain $\times 400$). Photomicrograph of peripheral blood smear showing red cells parasitized by ring stages of plasmodium falciparum along with thrombocytopaenia.

diffuse abdominal pain, abdominal distension, tachycardia, hypotension and rapid fall in urine output. Ultrasound abdomen revealed a splenic haematoma with collection of fluid in abdomen. Repeat Hb was 8.1 g/dL and diagnostic peritoneal tap revealed frank blood. He was resuscitated, transfused with three units of red cells and taken up for an emergency laparotomy. Laparotomy confirmed haemoperitoneum (Fig. 2) with 2.5 L blood stained fluid, enlarged friable spleen with rupture of the splenic capsule on the posterior surface and active bleeding (Fig. 3). As primary haemostatic mechanism failed, splenectomy was performed. He had a stormy post-operative period and despite inotropic and assisted ventilatory support, he developed refractory hypotension and complete renal shut down and succumbed to the illness. Histopathology of spleen (Fig. 4) showed congested red pulp with prominent malarial pigment laden macrophages along with parasitized RBCs thus confirming the diagnosis of malarial spleen.

Discussion

The present case presented to us on the sixth day after onset of fever when complications like cerebral malaria, hepatitis and acute renal failure had already set-in. Though the patient showed initial clinical improvement following antimalarial therapy, the unexpected event was the sudden onset of diffuse acute abdominal pain in the absence of any trauma, the aetiology of which could not be ascertained. Splenic rupture with haemoperitoneum was only confirmed during the subsequent emergency laparotomy.

Spontaneous rupture of the spleen is an uncommon condition. The aetiology includes infectious, neoplastic or haematological diseases. Only an estimated 2% of falciparum

Fig. 2 – Emergency laparotomy. Photograph demonstrating haemoperitoneum during the surgery.

malaria cases present with spontaneous splenic rupture.² The first case of spontaneous rupture of spleen was reported by Atkinson, an English Surgeon in 1874.³ A peculiar aspect of this complication is that it can occur in patients on antimalarial prophylaxis and treatment.⁴ Though the exact mechanism of splenic rupture in malaria is still not clear, the following mechanisms have been suggested^{5,6}: (i) cellular hyperplasia and congestion leading to increase in intra-splenic tension; (ii) splenic compression by increased intra-abdominal pressure during activities like sneezing, coughing and defecation; and (iii) reticuloendothelial hyperplasia resulting in venous congestion, thrombosis and infarction which cause sub-capsular haemorrhage and eventually stripping of the splenic capsule. A few diagnostic criteria for labelling a case as spontaneous rupture have been recommended by Orloff and Peskin⁷: (i) absence of any history of trauma; (ii) absence of any pre-existing splenic disease; (iii) absence of adhesions or scarring in the spleen; and (iv) presence of grossly normal spleen.

Fig. 3 – Post-operative splenectomy specimen. Photograph demonstrates an enlarged friable spleen with a rupture of capsule on the posterior surface.

Fig. 4 – Malarial spleen (Haematoxylin & Eosin stain $\times 100$). Photomicrograph of H&E stained section showing an expanded red pulp with prominent malarial pigment.

In order to detect this complication early, a high index of clinical suspicion is required along with abdominal ultrasonography or Contrast Enhanced CT scan of abdomen. Clinically, left hypochondrial pain occurring during or following treatment of malaria is the commonest presentation of splenic rupture in malaria.⁸ Our case did not present with left hypochondrial pain nor any history of trauma could be elicited. The trigger was probably violent movements exhibited by the patient due to the cerebral malaria.

Historically, the treatment of splenic rupture has been splenectomy but that increases the risk of certain infections such as pneumococcal disease and Malaria.⁹ With the emergence of splenic conservation in splenic trauma, similar concept has been recommended in spontaneous splenic rupture.¹⁰ However, such an approach requires serial monitoring of haemoglobin and regular abdominal ultrasonography to assess the progress of the patient. Splenectomy should thus be reserved for patients with severe rupture or uncontrolled bleeding and haemodynamic instability as was observed in this case.

Conclusion

In conclusion, spontaneous splenic rupture in complicated falciparum malaria is extremely rare. High index of clinical suspicion, preoperative diagnosis and rapid intervention are imperative in such a complication because delay in diagnosis may lead to catastrophic consequences.

Conflicts of interest

All authors have none to declare.

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