Journal of Infectious Diseases & Therapy

ISSN: 2332-0877

Qureshi, J Infect Dis Ther 2022, 10:5

Case Report Open Access

Spontaneous Rupture of Malarial Spleen: A Case Report

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Received: September 23, 2019; Manuscript No.JIDT-19-2797; **Editor Assigned:** September 27, 2019; PreQC No. JIDT-19-65895(PQ); **Reviewed:** October 11, 2019; QC No. JIDT-19-65895; **Revised:** July 20, 2022; QI No. JIDT-19-65895; Manuscript No. JIDT-19-2797(R); **Published:** August 17, 2022, DOI: 10.4172/2332-0877.1000507.

Citation: Qureshi S (2022) Spontaneous Rupture of Malarial Spleen: A Case Report. J Infect Dis Ther 10: 507.

Abstract

Spontaneous splenic rupture is a life threatening complication of malaria. Splenectomy has been recommended as the treatment option for hemodynamically unstable patients. Herein, we report a 29-year-old gentleman presented with high grade fever, acute abdomen and vomiting for three days. Laboratory evaluation did not show malaria parasite on the peripheral film. A CT abdomen done outside showed splenomegaly and hemoperitoneum. The patient deteriorated and underwent emergent exploratory laparotomy. Splenectomy was performed and large clots were evacuated. The subsequent biopsy of the ruptured spleen showed marked hemorrhagic necrosis and hemozoin pigment deposits consistent with malaria sequestered spleen. Detection of such a complication requires a high index of clinical suspicion and is extremely challenging in a patient with MP negative on peripheral film.

Keywords: Malaria; Spleen; Spontaneous rupture

Introduction

Sudden rupture of spleen in complicated malaria is a rare complication of hemoperitoneum [1]. The exact mechanism is unknown, but it thought to be linked to the formation of a subcapuslar hematoma [2]. In most of the reported cases, the patient has a positive malaria specie detected on peripheral film. CT is the diagnostic mordality to detect splenic injury. Upon rupture, patients presented with peritonitis and shock. It is recommended that the patients should be treated conservatively and splenectomy for hemodynamitcally unstable patients [3]. The incidence of malarial infection in Pakistan is increasing annually, and patients presenting with high grade fever and acute abdomen, with splenic rupture should raise the suspicion of malaria infection.

Our patient was presented with high grade fever, acute abdomen and had negative MP peripheral film. CT scan performed outside three days ago had spleenomegaly, multiple collections in left subphrenic, subhepatic, spleenic subcapsular and paracolic gutter. The patient developed acute abdomen and urgent surgical intervention was done. Upon laprotomy, he had splenic rupture. On subsequent biopsy, it showed malaria sequestered spleen. The patient developed sepsis post procedure and received high dose antibiotics. In a two weeks' time, the patient improved and he was discharged with vaccination with marked improvement.

Case Study

A 29-year-old-gentleman from Peshawar city was presented to Northwest General Hospital and Research Centre in the month of October 2018. He was seen in the emergency room with history of high grade fever and abdominal pain for the last five days. The patient was admitted at a local hospital where his investigations were all normal. MP smear was negative as well.

The patient received Artemether/Lumefantrine combination, fluoroquinolones prophylactically but despite his fever did not settle. The patient developed abdominal pain and referred to NWGH. The patient also had a CT abdomen performed outside but the report was not available.

Results

Physical examination showed left upper quadrant tenderness and rebound tenderness. Conjunctival pallor and abdominal distension were noted. The spleen was palpable 5 cm to 6 cm below the left costal margin. Blood pressure was 132/63 mmHg, pulse, 112/min, and body temperature 36.6°C. Labs except for pancytopenia were unremarkable. The malaria blood slide was negative. Screening for dengue and other infections were negative as well.

The CT abdomen was discussed with radiologist. The CT was suggestive of splenomegaly, multiple collections in left subphrenic, subhepatic, splenic subcapsular and paracolic gutter. The patient went into septic shock and shifted to the medical ICU. His abdominal distention worsened and an urgent surgical consult was made for his abdominal pain. An exploratory laparatomy was done. On exploration the patient had a ruptured spleen and with multiple hematomas. Splenectomy was performed and it was sent for biopsy (Figures 1 and 2).

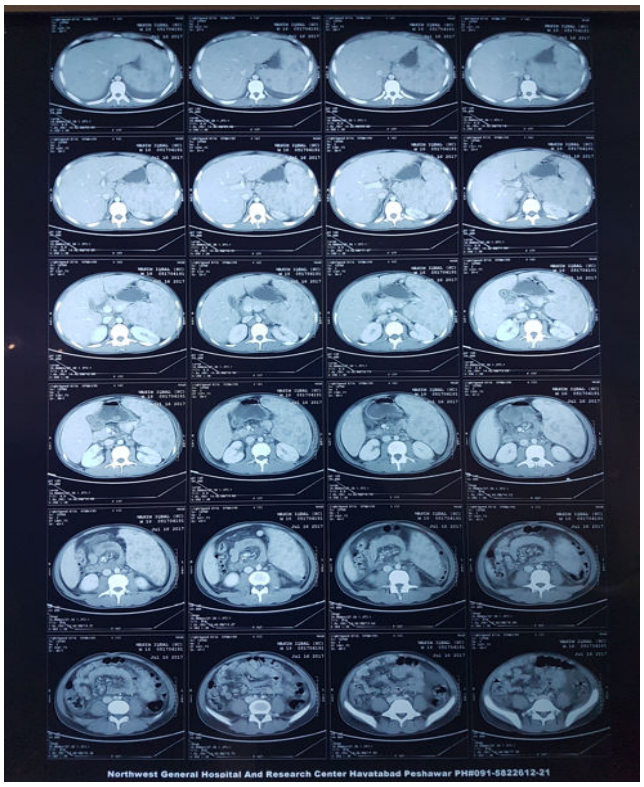

Figure 1: CT Abdomen showing splenomegaly, multiple collections in left subphrenic, subhepatic, splenic subcapsular and paracolic gutter.

Figure 2: Computed tomography scan.

Subsequent biopsy showed marked hemorrhagic necrosis and hemozoin pigment deposits consistent with malaria sequestered spleen. The patient was given dose of arthemeter and lumafentrine followed my primauine. The patient gradually improved, his fever settled and counts normalized. He was vaccinated against capsular organisms and discharged vitally stable (Table 1).

Laboratory investigations	Value	Normal range
Hemoglobin	10.42	13-18 g/dL
Red blood cell count	3.5	4.5-5.5 × 10^{12}/L
Hematocrit	29.9	40%-54%
MCV	85.6	83 fl-101 fl
Platelets	91.93	150-450 x 10^{9}/L
White cell count	3.22	4-11 x 10^{9}/L
Differential leukocytes	2.11	-
Neutrophils	1.01	1.65-8.25 x 10^{9}/L
Lymphocytes	-	0.8-4.95 x 10^{9}/L
Other tests		
Creatinine	0.98	0.2 mg/dl-1.2 mg/dl
Random glucose	96	110 mg/dl-165 mg/dl
PT	20	10.0 sec
ALT	31	10 U/L-40 U/L
Malarial parasite	Not seen	-
CRP	10.2	7.51 mg/dl
Calcium	8.8	8.5 mg/dl-10.5 mg/dl
HCV antibody	Non-Reactive	-
Hbs Ag	Non-Reactive	-
HIV antibody	Non-Reactive	-
Blood culture	No growth	-
Urine culture	No growth	-
Urine R/E	Normal	-

Table 1: Relevant investigations done. Note: MCV=Mean Corpuscular Volume, PT=Prothrombin Time, ALT=Alanine Aminotransferase, ESR=Erythrocyte Sedimentation Rate, CRP=C-Reactive Protein.

Discussion

Malaria is said to be one of the leading causes of morbidity and mortality worldwide, especially in tropic and sub-tropic areas. The infecting rate of malaria in Pakistani community is about 1.6 million per annum. Malaria is the second most common disease in Pakistan which accounts for 16.5% disease burden rate across the country.

Nearly 0.3 million microscopic examined confirmed cases were reported in 2011. More than 80% causes of malaria were contributed by *P. vivax* and the remaining by *P. Falciparum*. Ninety-five millions of Pakistan's 161 million people, roughly 60% of Pakistan's population, live in malaria-endemic regions [4,5].

The spleen plays an important role in malaria, producing antibodies against the malarial parasite. The mechanism of spleen rupture remains poorly defined. Three mechanisms have been suggested so far. The first of these mechanisms is an increase in intrasplenic tension due to cellular hyperplasia and engorgement. Second, the spleen may be compressed by abdominal musculature during physiological activities such as sneezing, coughing, defecating, and sitting up or turning in bed. Third, vascular occlusion due to reticuloendothelial hyperplasia may be involved, which ultimately results in thrombosis and infarction. This leads to interstitial and subcapsular hemorrhage and stripping of the capsule, which further results in the distended capsule finally giving way. The splenic complications of Plasmodium infection are hematoma, rupture, hypersplenism, ectopic spleen, torsion, cyst, and infarction. Splenomegaly occurs earlier compared to other complications, such as rupture [6]. A palpable spleen may be present within 3 to 4 days of the onset of symptoms and may be noted in 50% to 90% of patients with malaria [7]. The spleen may subsequently become more hyperemic, swollen and tender with each febrile paroxysm, though partial resolution can occur between paroxysm, though partial resolution can occur between paroxysm. Following appropriate treatment, the spleen usually decreases in size within days to weeks.

Review articles have reported only 22 malaria cases with spontaneous splenic rupture in the English language literature since 1960. The predominant Plasmodium species in these cases were *P. vivax* (15 patients), followed by *P. falciparum* (5 patients) and *P. malariae* (2 patients) [8]. Formulated a flowchart for the management of malarial splenic rupture after reviewing 252 cases previously reported in the literature. This group emphasized the importance of non-operative management of hemodynamically stable patients but recommended splenectomy as a treatment for persistent hemodynamic instability.

Conclusion

No well-established studies on the management of the splenic rupture in malaria patients have been performed. Currently, splenectomy has been accepted as the traditional treatment of choice in most cases of splenic rupture. However, perioperative risks associated with splenectomy and growing concerns about the loss of immunologic functions have promoted the development of nonsurgical management strategies.

In conclusion, splenic rupture during acute malaria is rare but is likely underdiagnosed and underreported. It is a life-threatening malaria complication that can occur after starting treatment. Therefore, early diagnosis and appropriate disease management are essential.

Conflict of Interest

A written consent was taken and the authors declare that there is no conflict of interests regarding the publication of this paper.

Disclaimer

None to declare.

Funding Sources

None to declare.

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