Primary research

**Spontaneous rupture of malarial spleen: two case reports and review of literature**

Yusuf Yagmur, Ismail Hamdi Kara, Mustafa Aldemir, Hüseyin Büyükbayram, Ibrahim H Tacyildiz and Celalettin Keles

Dicle University, Faculty of Medicine, Diyarbakir, Turkey

Received: 26 June 2000
Accepted: 11 July 2000
Published: 10 August 2000

**Abstract**

Malaria has long been among the most common diseases in the southeast Anatolia region of Turkey. In 1992, 18,676 cases were diagnosed in Turkey, and Diyarbakir city had the highest incidence (4,168 cases), followed by SanliUrfa city (3,578 cases). Malaria was especially common during 1994 and 1995, with 84,345 and 82,094 cases being diagnosed in these years, respectively. Spontaneous rupture of malarial spleen is rare. We saw two cases during 1998, which are reported herein. Both patients were male, and were receiving chloroquine treatment for an acute attack of malaria. One of the patients had developed abdominal pain and palpitations, followed by fainting. The other patient had abdominal pain and fever. Explorative laparotomy revealed an enlarged spleen in both patients. Splenectomy was performed in both patients. We have identified 15 episodes of spontaneous rupture of the spleen in the English language literature published since 1961. Because of increased travel to endemic areas and resistance to antimalarial drugs, malaria is a major medical problem that is becoming increasingly important to surgeons worldwide. Malaria is a particularly important problem in the southeast Anatolia region of Turkey. Prophylactic precautions should be taken by tourists who travel to this region, especially during the summer.

**Keywords:** malaria, prophylactic precautions, ruptured spleen

**Introduction**

Involvement of the spleen in malaria that results in splenomegaly renders this organ prone to complications such as rupture [1]. In areas where malaria is endemic, spontaneous rupture of spleen is uncommon. Because of increased travel to endemic areas and resistance to antimalarial drugs, however, malaria is a major medical problem, which is becoming increasingly important to surgeons worldwide. During the 1980s and 1990s in the USA, the annual number of diagnosed cases of malaria rose by twofold to fourfold that of the preceding decade [2,3]. We report two cases of spontaneous rupture of malarial spleen treated with splenectomy.

**Case reports**

**Case 1**

A 56-year-old man presented at hospital with sudden onset of upper abdominal pain, followed by palpitations and fainting. He had been taking chloroquine. In the emergency department he was hypotensive and had pain in the left hypochondrium. Ultrasound showed an enlarged, ruptured spleen and free blood in the abdomen. There was free blood (1500 cm²) in the peritoneal cavity, and a friable, enlarged, ruptured spleen (grade III) was found and removed. Pathological examination revealed that the spleen weighed 950 g and measured 21 × 12 × 7 cm. Gross examination showed the spleen to be dark grey,
Critical Care  Vol 4 No 5  Yagmur et al

**Case 1**

A 52-year-old man presented to the hospital with a capsular tear and subcapsular haematoma on the medial side. Microscopy revealed dilatation of sinuses, increased pigmentation and elevated concentration of macrophages. Thick and thin films revealed the presence of *Plasmodium vivax*. The patient, much improved, was discharged 6 days after the operation.

**Case 2**

A 32-year-old man was receiving treatment for a duodenal ulcer in the gastroenterology department. He was also receiving chloroquine for malaria. For 4 days of hospitalization he had high-grade fever and immediately became hypotensive, and had abdominal pain. We performed abdominal paracentesis, which demonstrated free blood in the peritoneal cavity. Explorative laparotomy revealed approximately one litre of blood in the peritoneal cavity and an enlarged spleen, measuring almost double its normal size with a tear on the inferior surface (grade II). Splenectomy was performed. The spleen was 1050 g and measured 22 × 15 × 8 cm. Gross examination showed grayish brown discoloured spleen with capsular tears at a few places. Microscopy revealed congestion and dilatation of sinuses, and bleeding areas. *P vivax* was identified by thick film. The patient was discharged well 11 days after the operation.

**Discussion**

Malaria parasites have been with us throughout human history. They probably originated in Africa (along with humans), and fossils of mosquitoes show that the vectors for malaria have existed for at least 30 million years. *Plasmodium* parasites are highly specific, with humans as the only vertebrate host and *Anopheles* mosquitoes as the vectors. This specificity of the parasites also indicates a long and adaptive relationship with humans [4].

Despite initial success, there was complete failure to eradicate malaria in many countries because of a number of factors. Although technical difficulties such as vector and parasite drug resistance have played a part, failure in this endeavour was probably due to social and political factors that prevented efficient application of control measures [4]. The malaria control operation was criticized for being too much like a military operation, and the lack of explanation given to local populations meant that the control measures received little support, or even opposition [5].

Accurate information on the global incidence of malaria is difficult to obtain because reporting is particularly poor in areas that are known to be highly endemic. The global incidence of malaria is estimated to be nearly 120 million clinical cases each year, with nearly 300 million people carrying the parasite. The vast majority of malaria deaths occur in Africa. Estimates vary greatly; the World Health Organization [6] quoted a figure of 800 000 deaths/year in African children during 1991.

Malaria is generally endemic in the tropics, with extensions into subtropic regions. Malaria in travellers who arrive by air is now an important cause of death in nonmalarious regions.
areas [7], and this is not helped by ignorance or indifference of travellers to prophylactic measures [8].

Malaria has long been among the most common diseases in the southeast Anatolia region of Turkey. During 1992, 18,676 cases were diagnosed in Turkey, and Diyarbakir city had the highest incidence (4168 cases), followed by SanliUrfa city (3578 cases). The southeast Anatolia region is in upper Mesopotamia, covering Diyarbakir, SanliUrfa, GaziAntep, Adiyaman, Batman, Mardin, Siirt and Sirnak. Malaria was especially common during 1994 and 1995, with 84,345 and 82,094 cases being diagnosed in these years, respectively. However, in 1998 the number of new cases decreased, with 36,842 cases being encountered (Table 1). Proguanil with chloroquine have been advised as the best prophylactic regimen for tourists travelling to the southeast Anatolia region of Turkey between March and November [9].

Spontaneous rupture of the spleen is well described in many diseases, of which malaria is the most common [10,11]. Other such diseases include infectious mononucleosis, splenic neoplasms and haematological malignancies [12–15]. The incidence of rupture of the spleen in malaria is poorly defined. Comparisons of cases that occur in the setting of natural or induced infection have most frequently been employed to investigate this issue. Natural infection is that acquired via a mosquito bite or transplacentally. Induced infection is that obtained through blood transfusion, sharing of needles, laboratory accidents and

| Reference | Case no. | Route | Long-term resident of malaria-endemic area | Malarial stage | Species | Symptoms and signs | Surgical therapy | Outcome |
|-----------|---------|-------|------------------------------------------|----------------|---------|--------------------|-----------------|---------|
| 16        | 1       | Natural | No                                       | Chronic        | *P malariae* | Shock, Kehr’s sign, LUQ tenderness | Splenectomy     | Lived   |
| 17        | 2       | Natural | No                                       | Acute          | *P vivax*  | LUQ pain, Kehr’s sign          | Splenectomy     | Lived   |
| 18        | 3       | Natural | No                                       | Acute          | *P falciparum* | No material                  | No material     | Lived   |
| 19        | 4       | Induced | No                                       | Acute          | *P vivax*  | Fever, Kehr’s sign, LUQ tenderness | Splenectomy     | Lived   |
| 5         | 5       | Induced | No                                       | Acute          | *P vivax*  | No material                  | Splenectomy     | Lived   |
| 6         | 6       | Induced | No                                       | Acute          | *P vivax*  | No material                  | Splenectomy     | Lived   |
| 7         | 7       | Induced | No                                       | Acute          | *P vivax*  | No material                  | Splenectomy     | Lived   |
| 20        | 8       | Natural | No                                       | Acute          | *P falciparum* | Kehr’s sign, LUQ pain | Splenectomy     | Lived   |
| 21        | 9       | Natural | No                                       | Acute          | *P vivax*  | Fever, back pain, severe shock | None            | Died    |
| 22        | 10      | Natural | No                                       | Acute          | *P vivax*  | Fever, hypotension, diffuse peritoneal signs | None            | Lived   |
| 23        | 11      | Natural | No                                       | Acute          | *P falciparum* | Hypotension, Kehr’s sign, diffuse peritoneal signs | Splenectomy     | Lived   |
| 24        | 12      | Natural | No                                       | Acute          | *P falciparum* | Fever, LUQ pain               | Splenectomy     | Lived   |
| 25        | 13      | Natural | Yes                                      | Acute          | *P vivax*  | LUQ pain, palpitations       | Splenectomy     | Lived   |
| 26        | 14      | Natural | Yes                                      | Acute          | *P vivax*  | LUQ pain, fever              | Splenectomy     | Lived   |
| 15        | 15      | Natural | No                                       | Acute          | *P malariae* | Fever, headache, LUQ pain     | None            | Lived   |
| * 16      | 16      | Natural | Yes                                      | Acute          | *P vivax*  | LUQ pain, fever              | Splenectomy     | Lived   |
| * 17      | 17      | Natural | Yes                                      | Acute          | *P vivax*  | Fever, palpation, fainting   | Splenectomy     | Lived   |

LUQ, left upper quadrant. *Reported herein.
Splenectomy is accepted as the treatment of choice in cases of spontaneous rupture of the spleen. Of the 17 patients described since 1960 (including those described above), 13 patients underwent surgical procedures, all of which were splenectomies. In regions in which malaria is not endemic, improved surgical techniques and supportive care, in addition to increased preoperative and postoperative risk of splenectomy, have led to attempted nonoperative management of splenic rupture in many cases of penetrating and blunt trauma [28]. Nonoperative management consists of observation for 7–14 days in the hospital, strict bed rest, and administration of fluid and blood as needed [25]. In areas in which malaria is endemic, there is growing evidence to suggest that management of spontaneous rupture of malarial spleen without splenectomy should be attempted. A conservative strategy is also reasonable in patients who travel frequently to malarious areas. Splenectomy should be reserved for those patients with severe rupture or those with continued or recurrent bleeding [26].

**Conclusion**

Changes in the structure of the spleen during the course of malaria can result in asymptomatic enlargement or complications such as haematoma formation and rupture. Primary exposure to malaria and infection with *P. vivax* appear to be important factors in spontaneous rupture of the spleen. Malaria is still important in the southeast Anatolia region of Turkey. Prophylactic measures should be taken by tourists who travel to this region, especially those who do so during the summer.

**References**

1. Patel MI: *Spontaneous rupture of a malarial spleen [letter].* Med J Aust 1993, 159:836–837.
2. Centers for Disease Control: *Cases of specified notifiable diseases. United States, weeks ending December 29.* MMWR 1990, 39:943.
3. Schultz MG: *Malaria in-migrants and travelers.* Trans R Soc Trop Med Hyg 1989, 83:31–34.
4. World Health Organization: *The biology of malaria parasites: report of a WHO Scientific Group.* Geneva: WHO Technical Report Series; 1987, No 743:179–199.
5. World Health Organization: *Coordination of anti-malarial activities in Southeast Europe.* Geneva: WHO meeting, 1980.
6. Anonymous: *World malaria situation 1990.* Division of Control of Tropical Diseases. World Health Stat Q 1992; 45:257–266.
7. Woodruff AW, Wright SG, Wright J: *A synopsis of infectious and tropical diseases.* Bristol, 1987.
8. World Health Organization: *The role and participation of European countries in the fight against malaria in the world: report on a conference.* Copenhagen: WHO; 1980.
9. Akdur R: *Epidemiology of malaria [in Turkish].* In: Sitma, Malaria. Edited by Ozcel MA. Izmir: Ege Universitesi Basimevi; 1999:51–118.
10. Bucinto R, Kald A, Borch K: *Spontaneous rupture of the spleen [case report].* Eur J Surg 1992, 158:129.
Authors’ affiliations: Yusuf Yagmur, Mustafa Aldemir, Ibrahim H. Tacyildiz and Celalettin Keles (Department of General Surgery, Dicle University, Faculty of Medicine, Diyarbakir, Turkey), Ismail Hamdi Kara (Department of Family Practice, Dicle University, Faculty of Medicine, Diyarbakir, Turkey), and Hüseyin Büyükbayram (Department of Pathology, Dicle University, Faculty of Medicine, Diyarbakir, Turkey)

Correspondence: Ismail Hamdi Kara, Assistant Professor, Dicle Universitesi, Tip Fakültesi, Aile Hekimligi ABD, 21280-Diyarbakir, Turkey. Tel: +90 542 434 2825/412 248 8526; fax: +90 412 248 8440; e-mail: ihkara13@hotmail.com

http://ccforum.com/content/4/5/309