Learning from errors

The importance of a travel history in the preoperative assessment of an elective surgical patient

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Summary

The authors present the case of a 43-year-old gentleman who was admitted for an elective surgical removal of an eroded gastric band. The patient reported no medical concerns and other than a mild anaemia of haemoglobin of 10.6, his preoperative assessment was non-significant. Postoperatively, the patient spiked temperatures on multiple occasions. When a travel history was subsequently taken, the patient revealed he had returned from Nigeria the night before his elective surgery. The patient tested positive for *Plasmodium falciparum* malaria for which he was successfully managed with oral quinine and doxycycline, and recuperated well both from malaria and the surgery. *P falciparum* malaria is a medical emergency and increases the morbidity and mortality of anaesthesia and surgery. Travel histories are not currently routinely taken as part of the preoperative assessment for elective surgical admissions; the authors argue that it should become a mandatory part.

BACKGROUND

The most deadly vector-borne disease in the world, *Plasmodium falciparum* malaria is a medical emergency demanding prompt treatment.¹ It is a multiple system disease, and may often mimic other clinical presentations.^{2–3} *Falciparum* malaria increases the morbidity and mortality of both anaesthesia and surgery¹ and as such, it is recommended elective surgical procedures are delayed until the acute malarial episode has been successfully managed.⁴ Elective surgery contributes to the vast majority (78%) of surgery performed under the National Health Service.⁵ We present a case of *Falciparum* malaria misdiagnosis in an elective surgical patient; we argue that travel histories should be routinely taken as part of the preoperative assessment in elective surgery, in an attempt to prevent such errors in the future.

CASE PRESENTATION

A 43-year-old gentleman had a laparoscopic gastric band insertion in 2008. Several months after his surgery he reported loss of restriction to solids and the possibility of an eroded gastric band was suspected. A CT abdomen confirmed gastric band erosion and he was admitted for elective surgical removal of his gastric band in January 2011. The patient reported no medical concerns, and other than a mild anaemia of a haemoglobin (Hb) level of 10.6, compared to his normal baseline of an Hb of 12, his preoperative bloods taken on the morning of his admission were normal including a white cell count (WCC) of $5.7 \times 10^9/l$. On the day of his surgery, he underwent an oesophagoduodenoscopy which confirmed a band erosion of approximately 50% of the band's circumference. Just before his surgery in the afternoon, he started to develop a fever which was attributed to possible sepsis from the gastric band erosion. Hence, the patient was given antibiotic cover in the form of 1.2 g intravenous ceftriaxone and the eroded gastric band was removed laparoscopically without complications.

Postoperatively he was feverish on multiple occasions. A full septic screen was subsequently carried out which did not demonstrate any abnormality. A CT abdomen/pelvis demonstrated no collections and no leak from the stomach. On postoperative day 3, the spiking temperature continued despite antibiotic cover and his anaemia worsened with his Hb dropping to 7.6 g/dl and he was transfused two units of blood. His WCC remained normal at $6.4 \times 10^9/l$. A full travel history was taken, which elicited that the gentleman had returned from Nigeria the night before his planned surgery. Subsequently Giemsa-stained thick and thin peripheral blood smear for malaria were sent for analysis. It demonstrated that the patient was *falciparum* malaria positive with a parasitaemia of 0.7%. Blood films showed erythrocytes containing *P falciparum* trophozoites (figure 1A) which will later rupture releasing merozoites (figure 1B) to invade new erythrocytes. Viral hepatitis and HIV serology were negative. The patient was commenced on oral quinine and doxycycline with marked improvement within 48 h and was fever free after 96 h. The parasite count returned to zero, 3 days post commencement of oral quinine. Throughout his stay he developed no evidence of cerebral malaria, renal dysfunction, clotting disorders or pulmonary oedema.

OUTCOME AND FOLLOW-UP

The patient recuperated well both from malaria as well as the surgery and had an uneventful recovery. Upon outpatient follow-up he had no complaints.

DISCUSSION

Laparoscopic adjustable gastric banding is currently the most frequently performed bariatric procedure in Europe and Australia, and has gained widespread popularity in the United States.⁶ It carries a reported 1–2% incidence of band erosion into the gastric wall.^{7–10} Gastric band erosion with sepsis requires prompt removal of the band. The

Figure 1 *Plasmodium Falciparum* malaria on thin blood film. (A) Trophozoites (white arrows). (B) Gametocytes (black arrows).

occurrence of this is rare and gastric band erosion usually presents without signs of overt sepsis as the process of erosion is slow and the capsule of the band protects the peritoneal cavity from spillage of gastric contents. In our institute, with an experience of over 600 bands, we have seen only one case of early band erosion presenting with fevers, shivers and signs of peritonitis.

With an estimated 300 million new cases of per year, and approximately 2–3 million deaths resulting from contraction, malaria is the most deadly vector-borne disease in the world. Almost all malaria deaths arise from the parasite *P falciparum* which carries a poor prognosis with a high mortality in the absence of prompt treatment.¹ However, the diagnosis of malaria may be complicated. Although paroxysms of fever with chills and rigor at regular intervals are the classical symptoms of malaria, *P falciparum* malaria can affect any organ system and thus can mimic multiple diseases including surgical presentations, for example, appendicitis.^{2 3}

In patients with malaria careful preoperative assessment of conscious level is required by way of the Glasgow Coma Score. Respiratory depression may cause an increase in arterial carbon dioxide levels leading to cerebral vasodilatation that may result in cerebellar herniation in a patient in whom the intracranial pressure is already elevated. Additionally, the patient with impaired neurological function preoperatively is likely to deteriorate postoperatively. Emergency surgery during acute episode of malaria should have mannitol and frusemide readily available to lower the intracranial pressure as needed.⁴

In addition to being a medical emergency, *P falciparum* malaria increases the morbidity and mortality of anaesthesia and surgery. Thus, it is generally recommended to delay surgery in patients with an acute episode of malaria until the malarial episode has responded to treatment. Premedication and administration of sedative drugs is better avoided in all but uncomplicated cases of malaria.⁴ Despite this, travel histories are not routinely taken in patients admitted for elective surgical procedures, and there is an absence in the current literature and guidelines recommending travel histories to be a compulsory aspect in the preoperative assessment of elective surgical admissions.

In this case, the absence of a travel history in an elective surgical admission, led to a delay in diagnosis, which resulted in a delay in initiating antimalarial therapy by 4 days, and placed the patient at risk when he underwent surgery with acute *P falciparum* malaria without the

appropriate preoperative assessment and necessary precautions during anaesthesia and surgery. It is our opinion that a recent travel history should always be taken for any admission, with malaria considered as part of the differential diagnosis in each case presenting with a fever and a recent travel history to an endemic area no matter what other symptoms due to the important medical and surgical implications. The authors recommend a parasite smear to be considered in cases with unexplained fever or anaemia, in particular cases with a normal WCC as in our patient, which argued against a standard postoperative bacterial infection.

When our patient presented, the UK guidelines recommended quinine therapy followed by doxycycline or clindamycin as first-line therapy for *P falciparum* malaria.^{11 12} Since then, intravenous artesunate was found to comply with international Good Manufacturing Practice thus allowing its licensing in the European Union.¹³ Artesunate has been shown to result in a greater reduction in *P falciparum* malaria mortality.¹⁴ WHO recommends artemisinin combination therapies as the first-line therapy for *P falciparum* malaria worldwide.¹⁵

Learning points

- ▶ A recent travel history should be routinely taken for every patient, including elective surgical admissions.
- ▶ The medical profession should have a high index of suspicion for coexisting pathologies.
- ▶ For patients travelling from endemic areas, the possibility of malaria should always be assessed and appropriate screening instigated.
- ▶ Elective surgery ideally should be delayed until results of the malaria screen are available. A high index of suspicion is required to ascertain the diagnosis.
- ▶ Emergency surgery may be performed on patients with acute malaria but requires preoperative planning, with meticulous anaesthesia, and intraoperative and postoperative management.

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Competing interests None.

Patient consent Obtained.

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