Worms and war: A case report of trauma and tropical disease intersecting

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ABSTRACT

Background: We report a case of heavy intestinal infestation with Ascaris lumbricoides complicating the surgical management of a gunshot injury to the abdomen. Co-existent traumatic and infectious pathologies in this case highlight the complex burden of illness among children living in areas of violent conflict, with clinical relevance to trauma surgeons in the tropics.

Key words: Trauma, Ascaris lumbricoides, violent conflict, enterotomy, surgery, child

DOI: 10.4103/0189-6725.62858

INTRODUCTION

Many areas of the world affected by violent conflict also carry a high burden of tropical diseases.[1] We describe an unusual case of ascariasis discovered incidentally at the time of exploratory laparotomy for a gunshot injury to the abdomen, illustrating the dual burden of illness due to violent conflict and infectious disease in a single patient.

CASE REPORT

A 12-year-old girl presented with gunshot wounds to the emergency unit of our urban hospital in Goma, Democratic Republic of Congo. Sporadic violence in this area is commonplace and the patient had been eating an evening meal around an open cooking fire outside her home with her family when gunshots were heard. The family members fled whereas the neighbours brought the wounded girl to the hospital. The assailants are not known and no investigation into the case has been initiated to date. Upon arrival at the hospital, the patient was agitated but responsive, with a heart rate of 140 beats/min, respiratory rate of 50 breaths/min, blood pressure of 60/40 and temperature of 35.9ºC. Resuscitation measures were initiated, including 2 units of packed red blood cells for a haemoglobin level of 60 mg/L. Apparent injuries included an open wound on the anterior abdominal wall, injury to the left shoulder and traumatic amputation of the thumb of the left hand. The patient was urgently brought to the operating suite for exploratory laparotomy, at which point the operating team was startled to discover numerous live adult worms in the abdomen [Figure 1].

A total of 22 Ascarids (seven had been fragmented by the bullet) were extracted one by one through the traumatic enterorotomy wound and from the peritoneal cavity. Further surgical exploration revealed a bullet entry wound at the left paramedian line posteriorly with a large exit wound in the left upper quadrant of the anterior abdominal wall through which the greater omentum was herniated. Intra-abdominal injuries included gastric perforation at the level of the greater curvature and multiple jejunal and ileal perforations. Surgical repair included approximation and closure of the gastric wall, resection of the injured jejunum (50 cm) and ileum (70 cm) with end-to-end re-anastomosis of the small bowel. The shoulder injury, which included a fractured scapula, was managed with dressings to the bullet entry and exit wounds and a figure-of-eight bandage and the thumb injury was managed with surgical debridement and compression dressing. The patient recovered from the abdominal surgery without complication [Figure 2]. She received metronidazole (500 mg IV tid for 10 days) and ceftriaxone (2 g IV qd for 10 days) for intra-abdominal infection prophylaxis as well as mebendazole (100 mg po bid for 3 days) post-operatively to eradicate any remaining Ascarids [Figure 2].

DISCUSSION

Violent conflict continues to plague the eastern regions of the Democratic Republic of Congo, despite hopes of peace after recent democratic elections. Ongoing

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Figure 1: Multiple motile adult worms (*Ascaris lumbricoides*) discovered at the time of laparotomy for penetrating abdominal trauma



Figure 2: Anterior abdominal bullet exit wound 29 days after surgical intervention shows good healing

threats to human security relate to the continued presence of armed rebels in the area following a 10-year, multi-national war that has claimed the lives of nearly 4 million people.[2] Traumatic injuries in the area are disturbingly common, even among civilians and children, due to the sustained presence of small arms and light weapons. Our patient suffered penetrating abdominal injuries as well as injuries to the shoulder and digit due to a bullet from unknown assailants, reflecting the atmosphere of lawlessness, impunity and random violence that characterizes the region.

Ascaris lumbricoides is the most common human intestinal nematode, infecting an estimated 1 billion people worldwide.[3] Generally, associated mortality and morbidity is low, although approximately 20,000 related deaths occur annually, mainly as a result of bowel obstruction from heavy infestations.[4] Children are disproportionately affected, with a prevalence of up to 90% in some areas.[5] Medical management with benzimidazoles (mebendazole or albendazole) or ivermectin is generally adequate for cure,[3] although occasional patients with symptoms of abdominal obstruction may require surgical intervention.[6,7] Our patient required laparotomy for management of her abdominal gunshot wounds, and we took this opportunity to manually remove the Ascarids through the site of the traumatic bowel perforation.

This case is remarkable as a unique report of heavy worm infestation complicating the surgical management of penetrating abdominal trauma. Prolonged operative time required for manual removal of 22 adult worms before definitive resection and re-anastomosis of the damaged jejunal and ileal sections might be expected to increase the risk of surgical complications, such as wound and/or intra-abdominal infection. Migration of live, motile adult Ascarids through the traumatic enterotomy wound might also be expected to contaminate the peritoneal cavity. Remarkably, however, our patient made an uneventful post-operative recovery without documented fever or wound infection, having received broad-spectrum antibiotic prophylaxis. Although rare in the industrialised countries, infestation with *A. lumbricoides* is common in the developing world, including many areas where populations experience violent conflict. With advances in surgical interventions in developing countries, trauma surgeons in the tropics may increasingly face helminthic infestations complicating the management of abdominal injuries.

We take the opportunity afforded by this interesting case to call attention to the ongoing plight of children in many areas of the world affected by the dual burden of violence and infectious diseases as well as opportunities for advocacy and prevention. Food hygiene and access to clean water can prevent transmission of A. lumbricoides, and it is estimated that anti-helminthic treatment of school-aged children alone would prevent 70% of the cases.[4] In addition to the direct effects of violent conflict, destabilisation of health care infrastructure takes an important toll on human lives through preventable and treatable conditions.[2] From a human rights perspective, a violation of our patient's right to security and access to a safe and clean food and water supply may be considered as root causes of her co-existent pathologies.

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Source of Support: Nil, **Conflict of Interest:** None.