CASE REPORT

Ileal perforation associated with dengue in the paediatric age group: an uncommon presentation

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Accepted 16 July 2016

SUMMARY

Acute abdomen in dengue, a common arboviral disease found in tropical and subtropical countries, is not uncommon and can occasionally present as acute surgical emergency requiring urgent surgical intervention. The spectrum of acute abdomen presenting as surgical emergency in dengue infection that raises suspicion of an abdominal catastrophe includes acute appendicitis, acute cholecystitis, appendicitis and, rarely, intestinal perforation. All cases of intestinal perforation including appendicular, gastric and jejunal perforation have been reported in adult patients during the course of dengue infection. However, intestinal perforation during the course of dengue infection in the paediatric age group has never been reported. We report two cases of ileal perforation in children occurring during the course of dengue infection.

BACKGROUND

Intestinal perforation during the course of dengue infection in the paediatric age group has never been reported.

CASE PRESENTATION

Dengue is a common viral infectious disease caused by flavivirus, which is transmitted to the man by infected mosquito, *Aedes aegypti* in tropical and subtropical regions of the world.^{1 2} Clinical presentation of dengue ranges from mild influenza like disease to more severe dengue haemorrhagic syndrome and/or dengue shock syndrome. Various atypical manifestations of dengue have also been reported. Gastrointestinal manifestations of dengue, once considered atypical and uncommon, are being increasingly identified and reported due to frequent occurrence of its epidemics globally. These gastrointestinal manifestations include hepatitis, acute pancreatitis, acute acalculus cholecystitis, non-specific peritonitis, febrile diarrhoea and rarely acute appendicitis.³ However, intestinal perforation in dengue is very rare and has been reported only in eight patients until today. The site of intestinal perforation was gastric, jejunal or appendicular perforation in these cases. However, to the best of our knowledge, no case of ileal perforation as a manifestation of dengue has been reported in the literature. We, for the first time, report two cases of dengue presenting as ileal perforation.

Case 1

A girl aged 10 years was admitted to our department with symptom of high-grade fever for 10 days, abdominal pain for 7 days that worsened

since last 3 days. She also had abdominal distension since last 3 days, and it started to increase since last 2 days. Abdominal distension was associated with bilious vomiting and obstipation. On general examination, there was mild dehydration, pulse rate (PR) of 110/min, respiratory rate (RR) of 30/min and blood pressure (BP) of 100/60 mm Hg. On abdominal examination, abdomen was grossly distended and tender with generalised guarding and rigidity, no apparent organomegaly and absence of bowel sound. Haemogram revealed Hb 9.0 g%, TLC 5000/cmm, DLC P₇₀L₂₆E₄M₀, platelets 90 000/cmm, and the results of malaria and Widal tests were negative with normal amylase and lipase levels. Her renal function test (RFT) and liver function test (LFT) were normal. However, with suspicion of dengue due to the presence of high-grade fever with low white cell count and platelet count in the patient during ongoing dengue epidemic, serology for Dengue-NS1 was also performed and it was positive for Dengue-NS1. A plain erect abdomen X-ray showed pneumoperitoneum with free gas under diaphragm.

After resuscitation, immediate exploratory laparotomy was performed under platelet cover. At surgery, single perforation of about 0.5 cm×0.5 cm size was found in ileum, about 30 cm proximal to ileocecal junction (figure 1). Primary repair of perforation was performed. Her postoperative course was uneventful, and she was discharged in a satisfactory condition on postoperative day 10.

Case 2

A boy aged 7 admitted in the paediatric department for high-grade fever and myalgia for 7 days. His investigations revealed Hb 10.5 g%, TLC 5600/cmm, DLC P₇₀L₂₅E₃M₂, platelet count 70 000/cmm, negative Widal test and malarial antigen test and positive dengue serology for dengue-NS1. He was managed conservatively with supportive treatment. There was initial improvement in the condition of the patient; however, after 5 days of admission, the patient developed severe abdominal pain followed by abdominal distension and bilious vomiting. On ultrasonography, there was ascites with internal echoes. A plain erect abdomen X-ray revealed pneumoperitoneum with free gas under both dome of diaphragm. The patient was immediately transferred to the paediatric surgery department for surgical management. On general examination, his PR was 120/min, RR was 25/min and BP was 102/60 mm Hg. On abdominal examination, abdomen was distended and tender with the absence of bowel sound, but no apparent

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To cite: Kumar P, Gupta A, Pandey A, et al. *BMJ Case Rep* Published online: [please include Day Month Year] doi:10.1136/bcr-2016-216257

Figure 1 Peroperative finding in case 1.

organomegaly. Repeat haemogram revealed Hb 10.0 g%, TLC 5000/cmm, DLC P₇₆L₂₀E₃M₁, platelet count 100 000/cmm (due to platelet transfusion), normal serum amylase and lipase and normal RFT and LFT. Exploratory laparotomy revealed a pinpoint perforation in ileum, 20 cm proximal to ileocecal junction (figure 2). Primary repair of ileal perforation was performed. The patient was transferred back to the paediatric department on postoperative day 6 and was discharged in a satisfactory condition on day 10.

DISCUSSION

Dengue is a worldwide condition spread throughout the tropical and subtropical countries and endemic in South-East Asia, the Pacific, East and West Africa, the Caribbean and the Americas. Indeed, dengue and dengue haemorrhagic fever has been a fast emerging major public health problem of international concern due to frequent occurrence of epidemics in tropical and subtropical countries, especially in endemic countries, explosive population growth, unplanned urban overpopulation with inadequate public health systems, poor vector control and increased travel across the endemic regions.

Commonly, dengue presents as an acute febrile illness, musculoskeletal pain, nausea, vomiting and petechial rash⁴ or as severe disease dengue haemorrhagic fever and dengue shock syndrome in one-third of cases.⁵ However, due to frequent emergence in outbreaks of dengue globally, there has been more and more

appearance of atypical manifestations of dengue such as neurological, abdominal and gastrointestinal, cardiac, renal, musculoskeletal, renal, respiratory, musculoskeletal or lymphoreticular manifestations.⁶ Abdominal and gastrointestinal manifestations are not uncommon but are frequently overlooked. In some cases, gastrointestinal involvement in dengue may present as acute abdomen and that may lead to diagnostic dilemma to physicians as well as to surgeon. There have also been reports of presentation of dengue as surgical emergencies such as acute pancreatitis,⁷ acute acalculous cholecystitis, acute appendicitis and perforation peritonitis⁸ due to gastric perforation,⁹ jejunal perforation¹⁰ or appendicular perforation.¹¹

We report our two cases as all of the cases of perforation peritonitis in dengue were adults, and these are the first two cases of perforation peritonitis due to dengue in children. In previous studies and our study, we have noticed that most of the gastrointestinal manifestations in dengue occurred during the second week of illness. It has been proposed that dengue virus may cause intestinal mucosal damage either by direct mucosal invasion or by release of endotoxins. Similarly, the cause of intestinal perforation in dengue is also unknown, but Vejchapipat *et al*¹² have suggested that dengue virus causes intestinal mucosal injury and intestinal mucosal ischaemia as suggested by high serum intestinal fatty acid binding protein levels, a specific marker for mucosal injury. In some cases, this intestinal mucosal injury and intestinal mucosal ischaemia may be severe enough to cause intestinal perforation.

Learning points

- ▶ Perforation peritonitis is a very rare complication of dengue.
- ▶ Consider dengue as a differential diagnosis of cases presenting with acute abdomen, along with high-grade fever and having pneumoperitoneum in the dengue endemic zone or during dengue epidemics.
- ▶ With timely recognition of the pathogenesis and proper management, one can have better outcome in these patients.

Contributors PK and AG operated the patient. AP helped in literature search. SNK read and helped in editing the manuscript.

Competing interests None declared.

Patient consent Obtained.

Provenance and peer review Not commissioned; externally peer reviewed.

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Figure 2 Peroperative finding in case 2.

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