Duodenal Perforation in a Patient with Dengue Fever –A Rare Entity

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Abstract
A 37-year-old gentleman presented to the emergency with a history of high-grade fever for 2 days and abdominal pain for one day. On arrival at the emergency department, he was hypotensive and tachycardic, while on abdominal examination he had generalized abdominal tenderness. He was started on fluid resuscitation with intravenous crystalloids. The initial impression was of an acute abdomen. The Abdominal X-ray showed air under the diaphragm. He was rushed to the operating room and underwent an emergency laparotomy that revealed a duodenal perforation for which he underwent Graham's patch repair and washout. No obvious cause was identified. He had low platelets for which Dengue NS-1 antigen was sent that came positive. Post-procedure he recovered and was discharged home. To our knowledge, this is the first case in which dengue fever associated with a duodenal perforation is being reported. It is the first case of gastrointestinal perforation in a patient with Dengue Fever to be reported outside of India. In endemic regions, clinicians must recognize such atypical manifestations.

Keywords: dengue fever, intestinal perforation, acute abdomen

Introduction:
A Flavivirus that is spread mainly via the mosquitoes Aedes aegypti and Aedes albopictus. The Dengue virus is comprised of 5 serotypes and is a common cause of vector-borne disease worldwide. It can cause a spectrum of disease that ranges from mild self-limiting fever to the potential life-threatening Dengue Hemorrhagic Fever presenting with bleeding and shock. Classically it manifests as fever, headache, rash, myalgia, and arthralgia, now increasingly being associated with atypical manifestations with abdominal, neurological, and cardiovascular system involvement. Gastrointestinal perforation is also now emerging as a potential complication of Dengue fever. Cases of dengue fever associated with gastric, jejunal, ileal, and appendicular perforation have been reported in the literature. We present a case in which Dengue was associated with duodenal perforation. To our knowledge, this is the first case of such kind to be reported.

Case Presentation:
A 37-year-old gentleman presented to the emergency with a history of fever for 2 days and abdominal pain for one day. Fever was documented as 104 degrees Fahrenheit and associated with rigors and chills. It was intermittent and relieved with medications. Generalized body aches were also present. The next day he developed abdominal pain initially in the epigastric region with no associated nausea and vomiting. His abdominal pain then became generalized and increased in intensity for which he came to the emergency department. He has no history of Non-Steroidal Anti-inflammatory Drug (NSAID) use, history of peptic ulcer disease, or other co-morbidities. On arrival at the ER, he was hypotensive and tachycardic, while on abdominal examination he had generalized abdominal tenderness. He was started on fluid resuscitation with intravenous crystalloids. The initial impression was of an acute abdomen.
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His abdominal X-ray was done (Figure 1.0) and revealed air under the diaphragm after which he was rushed to the operating room for emergency laparotomy with suspicion of bowel perforation. Perioperatively, there was a 5-6 mm perforation on the anterior wall of the first part of the duodenum. He thus underwent Graham's patch repair and washout.

Initial Complete Blood Count (CBC) had shown a Hemoglobin (Hb) of 15.1 mg/dl, Total Leucocyte Count (TLC) of 3.8 × 10^9/L, and platelet count of 105 × 10^9/L. His liver function tests were normal. His procalcitonin was 70.84 ng/mL. Postoperatively his CBC was monitored and platelet count gradually dropped and Dengue NS1 antigen was sent and came out to be positive.

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He came for a follow-up visit 2 days after discharge to the infectious disease clinic and 7 days later to the general surgery clinic and did not develop any complications. 34 days post-discharge, he presented to the emergency room with complaints of abdominal pain in the left upper quadrant region. He was discharged home on oral analgesics from the emergency room following review by the general surgery team. He came to the general surgery clinic the next day for review and again after 3 weeks with no further complications noted. He has remained healthy since then.

Discussion:

The leading cause of duodenal perforation is peptic ulcer disease usually due to NSAID use or H.Pylori infection but other causes include duodenal ischemia, duodenal diverticula, infectious diseases, and autoimmune conditions. The presence of thrombocytopenia prompted a Dengue NS1 antigen to be sent which came out to be positive. Malaria, Scrub Typhus, and other Rickettsial infections, meningococci, Leptospira, and certain other viruses other than Dengue may also present as fever with thrombocytopenia. However, it is not necessary that patients with Dengue fever always have low platelets especially in the early phase of the disease. Dengue should be a consideration in the mind of clinicians when patients present with acute febrile illness with or without thrombocytopenia in endemic regions.

The reported cases of gastrointestinal perforation in patients with Dengue fever has been summarized in table 1.0.

The World Health Organization (WHO) describes the course of illness due to the Dengue virus in 3 phases namely, the febrile phase, the critical phase, and the recovery phase. The critical phase occurring as the fever settles is when complications tend to arise due to plasma leakage, hemorrhage, or organ impairment. Management of Dengue according to the WHO guidelines consists of classifying cases into three categories; namely Dengue without warning signs, Dengue with warning signs, and Severe Dengue. Patients without warning signs who have adequate oral intake and without comorbid illness can be sent home. Patients without warning signs but with comorbid illness and those with warning signs such as abdominal
Being the first case of Dengue fever associated with pain, persistent vomiting, and an increase in hematocrit should be hospitalized. Those with warning signs should be started on I/V fluid resuscitation. Patients with signs of severe Dengue such as severe bleeding, severe organ impairment, or severe plasma leakage must also be hospitalized and require more aggressive fluid resuscitation. In our case, the patient presented as a case of Dengue with warning signs.

How gastric and intestinal perforation develops in patients with Dengue Fever is still unclear but elevated levels of I-FABP which is a marker of intestinal mucosal injury have been demonstrated. How this occurs though and whether it is a possible mechanism for intestinal perforation though is still a mystery yet to be solved.

Being the first case of Dengue fever associated with a duodenal perforation to be reported is a limitation but previous reports of the virus being associated with perforations in other parts of the gastrointestinal tract strengthen our conclusion.

References:

<table>
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<th>Serial Number</th>
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<td>1</td>
<td>2014</td>
<td>Jain AC et al</td>
<td>64</td>
<td>Female</td>
<td>Jejunum</td>
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<td>Left against medical advice due to financial issues</td>
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<td>Appendix</td>
<td>Exploratory Laparotomy, Exploratory Laparotomy, Appendicectomy</td>
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<td>Pillai M, Rao G</td>
<td>12</td>
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