



## Abdominal Manifestations of Dengue

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### Abstract

*Dengue fever has assumed epidemic proportions in urban India. The diverse presentations of this disease can confuse the internist. A wide range of abdominal symptoms closely mimicking an acute surgical abdomen necessitates the opinion of the gastroenterologist or a GI surgeon. Ignorance of the abdominal manifestations on the part of the GI surgeon could lead to un-indicated surgical interventions. Hence awareness of the pathophysiology of gastro intestinal manifestations of this disease can help prevent unindicated surgical procedures on critically ill patients.*

**Key words:** Dengue Fever Abdominal Manifestations

### INTRODUCTION

Dengue is the most common arbo viral disease which has assumed grave proportions in our country. The virus is the member of flavi virus group which typically is a single stranded RNA virus. The infection is transmitted by mosquito bite. Factors responsible for spread include explosive population growth, uncontrolled construction activity, failing public health systems

and increased travel across various regions. Almost every system of the human body is affected by dengue infection, hence the disease is notorious for its deceptive presentation. Management of this condition is predominantly the domain of the physician however abdominal manifestations of this disease present a dilemma to the gastroenterologist including the general surgeon.<sup>[1]</sup> The general surgeon may encounter

such dilemmatic abdominal features either in the ward or in patients housed in the ICU. An extensive spectrum of abdominal presentations makes diagnosis extremely difficult. Many a times the clinical features may closely mimic frank surgical lesions rendering treatment more aggressive when it is not required. The various abdominal manifestations of this lethal disease are presented.

## **PATHOLOGY**

The gastrointestinal tract contains organs which have a large proportion of reticuloendothelial cells. As a result the virus finds its way into the gastro intestinal tract.

### ***Liver***

The liver is one of the important organs of the reticuloendothelial system. The viral antigen is found in the Kupffer cells and cells lining the sinusoids of the liver.<sup>[2]</sup> The presence of antigen in the hepatocytes suggests the possibility of the hepatocytes supporting viral replication. Centrilobular necrosis, fatty change, hyperplasia of the kupffer cells, acidophil inclusion bodies and monocytic infiltration of the portal tracts are the pathological changes which are seen in the infected liver. Due to a wide variety of histopathological changes in the liver, a significant alteration in liver function is seen. Jaundice is a common accompaniment of dengue shock syndrome. Alterations of coagulations profile may herald the onset of DIC. This may also signal the development of fulminant hepatic failure. The earliest indicators of hepatic involvement are alterations in AST, ALT, alkaline

phosphatase and finally the bilirubin.<sup>[3]</sup> Therefore, monitoring liver function tests is essential for early diagnosis of impending liver dysfunction. Clinically, the patient complains of discomfort and pain in the right hypochondrium. Physical examination will reveal tender hepatomegaly in most cases. This can be confirmed by ultrasound examination.<sup>[4]</sup> If hepatomegaly is diagnosed on ultrasound close monitoring of liver function tests and coagulation profile is mandatory.

### ***Spleen***

Dengue is an infection which involves predominantly the reticuloendothelial system. The spleen is usually involved and is enlarged significantly to render it clinically palpable. As seen in malaria spontaneous rupture of the spleen has been reported even in cases of dengue. [5, 6] Such patients can present with features of an acute abdomen with severe shock. Awareness of this manifestation can help in early diagnosis followed by prompt resuscitation and surgical intervention.

### ***Gall Bladder***

The gall bladder is another organ which is affected in dengue fever. Acalculous cholecystitis though rare has been reported extensively.<sup>[7,8,9]</sup> The exact pathogenesis of acalculous cholecystitis is debatable. Various hypothesis have been put forward. These include prolonged fasting, spasms of the Ampulla of Vater, microangiopathy and ischemia. These lead to cholestasis and increased viscosity of bile.<sup>[8]</sup> Besides this, there is increased vascular permeability causing leakage of high protein containing fluid causing thickening of the gall bladder wall. A significant association

between thickening of the gall bladder wall and severity of progression of dengue fever has been reported.<sup>[9]</sup> In rare cases, rapid progression to gangrene and perforation have also been reported. In majority of cases the condition is self-limiting, not requiring any surgical intervention.<sup>[10]</sup> USG examination is helpful in diagnosing acalculous cholecystitis. Only if it progresses to perforation with development of diffused peritonitis is surgery warranted.

### ***Pancreas***

Pancreas is rarely involved in dengue fever. However, there have been case reports highlighting the development of acute pancreatitis in dengue fever.<sup>[11,12]</sup> The pancreas maybe involved perhaps by direct viral invasion leading to inflammation or due to severe hypotension. However, as it is extremely difficult to obtain tissue samples, the exact mechanism of pancreatic involvement cannot be ascertained. Serum amylase and lipase levels are significantly raised confirming pancreatic involvement. Ultrasound will reveal an enlarged and bulky pancreas with alteration of fat planes in severe cases. Treatment for this condition is predominantly supportive.

### ***Small and Large Intestine***

Small and large intestine are rarely involved in dengue fever. However, hypotension seen in Dengue shock syndrome may lead to significant ileus mimicking intestinal obstruction. It can also lead to severe abdominal distension. DIC would start manifesting as severe upper or lower GI bleed in advanced cases. Development of febrile diarrhoea confirms the intestinal involvement in

dengue fever.<sup>[13]</sup> There are no specific investigations to document any gut involvement in dengue fever. High index of suspicion based on clinical manifestations is pivotal for early diagnosis.

### ***Appendix***

Appendix has also been shown to be involved in dengue fever.<sup>[14]</sup> The features closely mimic acute bacterial appendicitis. There has been a case report wherein appendectomy was done, following which the patient developed severe thrombocytopenia leading to GI haemorrhage. However, the histology of the specimen revealed predominantly lymphocytic infiltration thus ruling out a bacterial aetiology.<sup>[14]</sup>

Carrying out surgical interventions in sick patients suffering from dengue fever can lead to disastrous consequences. Surgery imposes a severe brunt to the patient's already weakened immune system. This adds significantly not only to the morbidity but also to the mortality in these patients. Hence, it is important for the GI surgeon to be aware of all the possible gastro-intestinal manifestations of this lethal disease in order to avoid an unwarranted surgical procedure which could lead to a fatal outcome.

### **CONCLUSION**

The liver, gall bladder, spleen, pancreas, intestine and the appendix maybe involved with varying degree of severity in patients suffering from dengue fever.

The varying severity of involvement of these organs may closely mimic classical surgical diseases of these organs.

Awareness, thorough interpretation of clinical findings, laboratory and radiological reports is essential to prevent unindicated surgical procedures in sick and moribund patients.

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