

Management Experience of Surgical Complications of Dengue Fever Patients at Hameed Latif Hospital, Lahore

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Abstract

Objective: This study was designed to determine the frequency, pattern and management of surgical complications among patients with dengue fever.

Design: Cross sectional study design was used.

Settings: Hameed Latif Hospital, Lahore.

Methods: From March – 2009 to December – 2011 total of 875 patients of dengue fever with positive anti-dengue immunoglobulin M (IgM) serology were included in this study. Complete blood count, liver function test, blood urea, serum creatinin, serum amylase were determined in all patients admitted with the diagnosis of dengue fever. All the patients were evaluated for the presence of surgical complications by physical examination and real time ultrasound abdomen. Patient had CT – abdomen and brain where it was required. Pati-

ents having surgical complications were managed in dengue ward and ICU with multidisciplinary approach. Data entry and analysis was done by using SPSS 16.

Results: Among 875 patients with dengue fever, 491 (43.9%) patients were men and 384 (48.9%) were women with age range (18 – 70) years. Surgical complications were detected in 121 (13.8%) patients: acute cholecystitis in 46 (5.26%); acute pancreatitis in 19 (2.17%); injection abscess in 14 (1.6%); gastrointestinal bleed in 24 (2.74%); forearm compartment syndrome in 3 (0.34%); abdominal compartment syndrome in 2 (0.23%) and acute appendicitis, 4 (0.46%) patients. Cerebral bleed, retroperitoneal hematoma, abdominal wall hematoma and splenic rupture was seen among 3 (0.34%), 2 (0.23%), 3 (0.34%), and 1 (0.11%) patients, respectively. Out of 121 patients surgery was done in 20 (16.5%) patients while rest of 101 (83.5%) patients were managed conservatively. Two patients died.

Conclusion: Surgical complications are common and should be suspected in every patient with dengue fever. Majority of surgical manifestations of dengue fever were managed conservatively however surgical intervention was done in certain cases with favorable outcome.

Key words: Dengue hemorrhagic fever, Surgical complications, Management of DHF.

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Introduction

Dengue Fever (DF) is caused by a mosquito born single stranded RNA flavivirus and is transmitted by the

bite of infected female *Aedes aegypti* mosquito.¹ It is the most prevalent arbovirus infection in tropical and subtropical regions of the world with an estimated annual occurrence of dengue fever is 100 million cases of dengue fever with 250,000 cases of dengue hemorrhagic fever (DHF), and a mortality rate of 25,000 per year.^{2,3} The four dengue virus serotypes DEN₁, DEN₂, DEN₃ and DEN₄, are responsible for clinical manifestations of dengue fever which may be asymptomatic or may lead to undifferentiated fever, dengue fever (DF) or dengue hemorrhagic fever (DHF) and dengue shock syndrome. DHF and dengue shock syndrome (DSS) are leading causes of hospitalization and death especially among children.⁴ Although, the disease outbreak comparable to dengue had been described in the ancient Chinese literature (992 AD); the first epidemic of dengue was first recorded in 1635 in the French West Indies.⁵ In the past twenty years, dengue has re-emerged with an expanded geographic distribution from Southeast Asian countries west to India, Sri Lanka, the Maldives, and Pakistan and east to China.⁵ In 1982, DF was first documented in Pakistan from Punjab Province in 12 patients. The first major outbreak of dengue fever was reported in Karachi in 1994 – 95. During 2005 – 2009, a total of 4251 patients were diagnosed with dengue fever in Karachi.⁶ For the last 4 – 5 years, situation of dengue virus transmission is getting worse in Pakistan, especially big cities like Karachi and Lahore. This may be because of over crowded cities, intense monsoon, inadequate sanitation facilities, and hot and humid weather. This situation has been adversely affected by the recent floods and ongoing construction works.^{7,8}

Dengue fever (DF) is a systemic infection, which presents with high grade fever, headache, nausea, vomiting, generalized body aches, skin rash, bleeding gums and epistaxis. Because of severe pain in bones, joints and muscles, dengue fever is also known as “break bone fever”.⁷ Usually, the recovery is uneventful in most cases, but a significant number of patients develop one or more complications that include bleeding, dengue shock syndrome (DSS), acute renal failure, and seizures.⁹ This is not uncommon for dengue fever patients to present with surgical complications like acute pancreatitis,¹⁰ acalculus cholecystitis,¹¹ upper gastrointestinal bleeding,¹² acute appendicitis¹³ and splenic rupture.¹⁴ In 2011, Pakistan encountered the largest outbreak of dengue infection with the highest case – load and deaths. During this period, we observed several cases of surgical complications of the dengue fever presenting both in medical or surgical floors

at Hameed Latif hospital Lahore. This study was planned to describe the frequency and pattern of surgical complications of dengue fever and to determine the outcome of their treatment.

Materials and Methods

Study Design: This study was cross sectional.

Setting: Study was carried out from March 2009 to December 2011 at Hameed Latif Hospital Lahore.

Sampling Technique: Non-purposive sampling technique was used.

Sample Size: Approval from ethical committee of the hospital was obtained. Initial recruitment of 931 patients with clinical diagnosis of dengue fever was done, of which 56 patients with negative dengue IGM were excluded. Finally, we enrolled 875 patients in this study.

Inclusion Criteria: All patients with age above 18 years, who were either hospitalized through emergency room and outdoor clinic with typical features of Dengue fever as per WHO criteria¹⁵ [(febrile illness of 2 – 7 days, bleeding tendency, thrombocytopenia ($\leq 100,000$ platelets / μ l), or haemo-concentration ($> 20\%$)], and with positive serology of dengue specific IgM were included in the study.

Methods: Informed consent was obtained by explaining objectives and nature of the study. All patients were thoroughly evaluated clinically for presence of any surgical complication. Detailed history was taken for any pain, swelling, fever, seizures, hematemesis and malena or bleeding per rectum. This was followed by clinical examination which included examination of the abdomen, extremities, and neurological examination. All the patients with abdominal pain and tenderness underwent ultrasonography of abdomen and pelvis; CT scan abdomen and pelvis was obtained in few cases where required (in case of pancreatitis, retroperitoneal hematoma). CT – scan brain plan was done in patients with unexplained altered sensorium, history of seizures and with neurological deficit. Laboratory test like complete blood count, liver function test, blood urea, serum creatinin, serum amylase and coagulation profile were carried out in all patients. Surgical complications (along with diagnostic parameters) were looked for: acute cholecystitis (pain right hypochondrium and ultrasound abdomen showing gall bladder wall thickness > 3.5 mm); bleeding PR; upper GI bleedings,

abscess (pain, swelling or tenderness over the buttock or arm after receiving intramuscular injection); raised serum amylase level, and swollen pancreas on ultrasound, presence of free fluid in peritoneal cavity, cerebral bleed (abnormal cranial examination, or weakness of any part of body, CT scan showing collection of blood in the cerebral hemisphere); retroperitoneal hematoma (pain abdomen, bruising over the flank area; tenderness over abdomen, bruising of skin. Patients with surgical complications were shifted to intensive care unit where majority of hemorrhagic complications were managed non-operatively. However surgical intervention was done in patients where there was definite indication like abscess, and forearm compartment syndrome who were subjected to surgery. Conservative treatment included keeping patients nil by mouth and starting intravenous fluids or transfusion of blood, platelets, or fresh frozen plasma (FFP). All nonsteroidal anti-inflammatory drugs were avoided to use as analgesic. Empirical antibiotics were not used as standard protocol. Proton pump inhibitor omeprazole was given both as prophylaxis and treatment of gastrointestinal bleeding. Transfusions of whole blood, fresh frozen plasma and platelets were done as per recent guidelines, platelets were transfused if the count was less than 30,000 or in active bleeding with platelet count less than 50,000. However platelet transfusion was done preoperatively if the count was less than 50,000. Transfusion of fresh frozen plasma was also done preoperatively if INR was more than 1.5. The patients undergoing surgery also received prophylactic antibiotic ceftriaxone 1 gram 12 hourly. Patients were discharged when they were hemodynamically stable their coagulation profile was within normal range.

Data Analysis: Data entry and analysis was done by using SPSS 16.0. Surgical complications and management of patients was presented by using frequency and percentage.

Results

Among 875 patients with DF, there were 491 (56.1%) male patients and 384 (48.9%) female patients with a mean age of 34.79 ± 12.21 years (range 18 – 70 years). Male to female ratio was 1.28:1. The age distribution is described in table 1. Of the 875 patients included in our study, surgical presentations were observed in 121 (13.8%) patients who are summarized in (Table 1); conservative management was planned in majority of the patients (Table 3). Surgery was performed in 20

Table 1: Distribution of Patients by Age.

Age	Frequency	Percentage
18 – 30	398	45.5%
31 – 40	219	25.0%
41 – 50	145	16.6%
51 – 60	86	9.8%
61 – 70	27	3.1%
Total	875	100

patients, 14 with abscess, and 3 with forearm compartment syndrome. Two patients underwent laparotomy, one with ruptured spleen had splenectomy while other for bleeding duodenal ulcer where endoscopic management failed to secure hemostasis. One out of three patients of anterior abdominal wall hematoma required drainage due to progressively increasing size of hematoma. All the patients with upper and lower GI bleed were managed conservatively except one patient with upper GI bleed in whom endoscopy could not be successful in securing hemostasis and two patients with bleeding per rectum underwent band ligation for actively bleeding internal hemorrhoids. Whereas no surgical intervention was required among patients with acute appendicitis and acalculus cholecystitis. Mortality was encountered in 2 (1.7%) patients, one with intracerebral bleed and other with abdominal compartment syndrome. These patients also had dengue shock syndrome (DSS). None of the patient died of any surgical intervention. Three patients with forearm compartment syndrome settled with fasciotomy and none of these patients had limb loss.

Discussion

Dengue fever had been since 2010 and 2011 in Pakistan. This disease is considered a domain of physicians and surgeons are considered to have a little role to play. However, during this period we dealt with considerable number of surgical complications among patients with dengue fever. Acute cholecystitis was the most common surgical complication among our patients (5.26%). Wu et al¹⁶ noticed acute acalculus cholecystitis in 7.63% of DF patients whereas Khor et al¹⁷ reported acute cholecystitis in 3.05% (acalculus 1.82% and calculus 1.22%). In another local study, Shamim M,¹⁸ found cholecystitis in 7.28% patients with DF

Table 2:
Distribution of Patients by Surgical Complications.

Sr. No.	Surgical Complications	Frequency	Percentage
1.	Acute cholecystitis	46	5.26%
2.	Acute pancreatitis	19	2.17%
3.	Abscess	14	1.60%
4.	Upper GI bleed	13	1.48%
5.	Bleeding PR	11	1.25%
6.	Acute appendicitis	4	0.46%
7.	Forearm compartment syndrome	3	0.34%
8.	Cerebral bleed	3	0.34%
9.	Anterior abdominal wall hematoma	3	0.34%
10.	Abdominal compartment syndrome	2	0.23%
11.	Retroperitoneal hematoma	2	0.23%
12.	Splenic rupture	1	0.11%
Total		121	13.81%

Table 3: Distribution of Patients by Treatment.

Management	Frequency	Percentage
Conservative management	101	83.5%
Surgery	20	16.5%
Total	121	100%

(acalculus 5.32%, and calculus 1.96%).

Wu et al¹⁶ observed that thickening of the gallbladder wall returned to normal, and cholecystectomy was unnecessary unless complication developed. We also observed the same principle and managed all of our patients with acalculus cholecystitis on conservative treatment without any complication. Shamin et al,¹⁸ performed three surgeries for gall bladder pathology, which remained uneventful. Pancreatitis was rare in DF. Previously, there were isolated case reports highlighting pancreatic involvement in dengue fever, however the series from endemic area showed a little higher incidence.^{19,20} Shamim M¹⁸ described pancreatitis among 0.84% patients. In our series, pancreatitis was seen at a higher percentage 2.17%. However, all of these patients were managed conservatively.

Fourteen (1.6%) patients in our study were found to have abscess. Not a lot of authors have described this complication. Only a case report from India is available describing injection abscess during DHF; it

was managed by needle aspiration as consent for incision drainage was not given by the patient.²¹ In our study, we subjected all patients to incision and drainage, although initial oozing was troublesome but settled with packing and wound healing was uneventful. We observed quite a higher number of patients with abscesses; majority had the history of intramuscular injection for aches and pain during dengue prodromal symptoms. Abdominal compartment syndrome was seen in 02 (0.23%) patients. Previously, Shrishu R, et al,²¹ described abdominal compartment syndrome (ACS) in 3 patients in a study population of 858 children with DHF / DF. All patients with ACS died in their series due to refractory hypotension and associated DIC. We managed these patients in ICU by mechanical ventilation; and repeated ascitic taps were done to lower the intraabdominal pressure. Multiple transfusions of blood, platelets and fresh frozen plasma were given. One of our patients with abdominal compartment syndrome settled with conservative management while other died of multiple organ failure. Forearm compartment syndrome was also seen in 3 cases (0.34%). Previously, no literature has described this complication. We managed these patients by fasciotomy along with standard supportive treatment. In our study, 04 (0.46%) patients presented with acute appendicitis in patients with DF. Khor et al¹⁷ noticed acute appendicitis in 0.3% patients. Premaratna et al¹³ reported 12 cases of acute appendicitis in patients with

DF. Shamim M¹⁸ reported acute appendicitis among 1.96% patients. As Alvarado score was 4 – 5, we managed these patients conservatively and all patients recovered without any complication. Two patients (0.23%) in our study had retroperitoneal hematoma. In an autopsy report of 10 patients, Chan et al²¹ observed retroperitoneal hematoma in one case only. In present study, both the patients survived with conservative treatment by replacing blood, platelets and fluids.

Spontaneous splenic rupture was seen in only one (0.11%) patient. This patient was observed for an initial few hour and later on was explored due to hemodynamic instability he had an uneventful recovery. The two case reports on spontaneous splenic rupture have recommended splenectomy without fatal outcome.^{14,22} In our series, GI bleeding was seen in 2.73% while Chiu et al,²³ reported it in 8.4% patients with dengue fever. Chiu et al reported gastritis as a cause of upper GI bleeding in 67%; gastric ulcers, duodenal ulcer, and esophageal ulcer was in 3.1% patients. We managed 12 (92.3%) patients conservatively with transfusion of blood, platelets or FFP however one patients with massive upper GI bleeding underwent upper GI endoscopy. Endoscopy only one patient with active duodenal bleeding needed surgical intervention to get control of bleeding gastroduodenal artery.

Like our study, intracranial hemorrhage had also been reported by Kumar R,²⁴ et al. in which they found intracranial hemorrhage in 5 patients. They managed 2 patients with surgery and both of them survived. Anterior abdominal wall hematoma was another complication that we observed. All of the patients were managed conservatively, but one needed surgical exploration as the size was expanding. We managed both patients conservatively; one survived with residual neurological deficit while the other died of disseminated intravascular coagulation. Two patients had hematoma on flanks and one in the midline. The mortality was quite low in our study. Although majority of surgical complications of dengue fever can be managed non operatively, however emergency surgical procedures can be performed after adequate resuscitation and optimization of coagulation profile.

Conclusion

Majority of the surgical complications of dengue hemorrhagic fever are dealt conservatively, however, if needed, emergency surgical procedures can be performed safely with acceptable morbidity.

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