

Emergency Abdominal Surgery in Patient with Liver Cirrhosis

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ABSTRACT

The number of patients with cirrhosis who require surgery is increasing. Therefore, it can be expected that a growing number of patients with cirrhosis will undergo surgery. Patients with cirrhosis are at particularly at high risk for morbidity and mortality due to the stress of surgery and the effects of general anesthesia. The risk for morbidity and mortality are influenced by the type of surgery and the extent of liver dysfunction. In patient with cirrhosis who undergo emergent abdominal surgery the mortality rate may reach 50%. The Child-Pugh score is used to predict perioperative morbidity and mortality rates for patients undergoing intra-abdominal surgery. The mortality rate patient with Child Classification A was 10%, Child Classification B was 31% and Child Classification C was 76%. So, an approach to perioperative risk assessment, evaluation, and management of the cirrhosis patients who is a surgical candidate is very crucial. We reported a case of an elderly male patient with liver cirrhosis who would undergo emergent abdominal surgery.

Keywords: *liver cirrhosis, emergency surgery, child pugh classification*

INTRODUCTION

Liver cirrhosis is a diffuse process characterized by fibrosis and the conversion of normal liver architecture into structurally abnormal nodul. At the cirrhotic stage, liver disease is considered irreversible.¹ The number of patients with cirrhosis who require surgery is increasing. Despite advances in antiviral therapeutics, cirrhosis secondary to hepatitis B, C and chronic alcohol abuse continues to grow in number. At the same time, medications and treatments aim at improving survival in these patients have been increasing. Therefore, it can be expected that a growing number of patients with cirrhosis will undergo surgery. An estimated 1 in 700 patients admitted for elective surgery has abnormal liver enzyme levels. Some have estimated that as many as 10% of patients with advanced liver disease will undergo surgery in the last 2 years of their lives.²

Patients with liver cirrhosis are at particularly high risk for morbidity and mortality due to stress of surgery and effects of general anesthesia. Patients with cirrhosis is not contraindication for surgery. Certain

types of surgery can be undertaken safely if patients are evaluated and managed carefully. Child class C cirrhosis is a relatively contraindicated to elective surgery, as such patients are likely to develop postoperative complications and mortalities.³

We report a case of patient with advanced liver cirrhosis who would undergo abdominal surgery. Some things need to be considered such as (1) What are the effects of liver disease on anesthesia and surgery? (2) How is the risk of surgery in cirrhosis patients ?, (3) How to make perioperative risk assessment, evaluation and management of the patients with liver cirrhosis?

CASE

A 68 years old male was admitted to hospital with chief complaint of dyspneu. He did not have past history of upper and lower gastrointestinal bleeding. According to physical examination, he was apparently pale, fully alert, and the vital signs were still normal. The conjunctivae was pale and sclera was jaundice. The jugular venous pressure was normal. Heart and lung were also normal. Ascites and left hernia inguinalis were detected on abdominal examination. Both his legs were swollen. His nutritional state was moderate malnutrition.

The laboratory examination showed that

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hemoglobin level was 10.7 g/dL, leukocyte count was 12,500/mm³, the platelet count was decreased 64,000/mm³, creatinine 0.9 mg/dL, ureum level was 32 mg/dL, transaminase level was slightly increased (ALT= 85 mg/dL dan AST = 40 mg/dL), bilirubin was increased (total = 7.28 mg/dL, direct 5.60 mg/dL), protein level 6.8 mg/dL, albumin = 2.5 mg/dL, globulin = 4.3 mg/dL, electrolyte level was still normal (natrium = 135 mmol/L, potassium 4.0 mmol/L and chloride 112 mmol/L), fasting blood sugar 81 mg/dL dan post prandial was 112 mg/dL and the prothrombin time was increased (44 second, normal = 26-40 second), hepatitis seromarker Anti HCV was negative but HbsAg was positive.

The electrocardiography (ECG) and chest X-ray were unremarkable. Ultrasonography suggested liver cirrhosis with ascites without splenomegali. According the Child-Pugh class, his score was 11 (Child-Pugh class C). The diagnosis for this patient was advanced liver cirrhosis due to hepatitis B virus infection and left hernia inguinalis. Patient were treated by nutrition support, diuretics (furosemide and spironolactone), intravenous vitamin K and hepatoprotector.

On 21st day of hospitalization, the patient told the doctor that he felt a terrible pain in the inguinal area. His hernia was strangulated. Then the consultant surgeon decided to undergo emergent abdominal surgery. Before surgery, hypoalbuminemia, coagulation status and ascites were corrected. He received 20% albumin transfusion 100 mL/day for 2 days, and platelet transfusion. Fifteen packs of platelet transfusion were transfused and the platelet level increased from 64,000/mm³ to 148,000/mm³. One day before surgery, the anaesthesiologist assessed the patient condition. The anaesthesiologist's assessment showed that the patient had high risk category with 3rd grade ASA.

On the 23nd day of hospitalization, patient underwent emergency abdominal surgery with regional anesthesia. The surgery procedure consumed one hour. On the 13th day post surgery, the site of operation was bleeding and the wound was open. The laboratory results revealed platelet 80,000/mm³, and PT was increased 5 seconds above the control. Platelet transfusion was given and intravenous vitamin K were administered. Because his general condition gradually increased better, he was permitted to discharge from hospital. But, on the 12nd day after discharged from hospital (52nd day of care), he was re-admitted in hospital with coma hepaticum. Before 24 hours of hospitalization, he died due to hepatic encephalopathy and hepatorenal syndrome (ureum levels 167 mg/dL and creatinine 2.1 mg/dL).

DISCUSSION

We reported a case of an elderly male patient with advanced liver cirrhosis (Child-Pugh class C) who had to undergo emergent abdominal surgery because his hernia inguinalis was trapped. About 2 weeks after surgery he died because of encephalopathy and hepatorenal syndrome. Actually, he was at very high risk to develop complications and mortality during and after surgery.

Patients with cirrhosis are at particularly high risk for morbidity and mortality due to both the stress of surgery and the effects of general anesthesia. The risk for morbidity and mortality are influenced by the type of surgery and the extent of liver dysfunction.⁴ The risk appears to be much higher with open abdominal surgery than with laparoscopic surgery, to be much higher in abdominal and cardiac surgery than non abdominal and cardiac surgery. There were reports showed that the mortality rate in patients with liver cirrhosis were 20-50% for various type open abdominal surgery.⁵ Mansour et al, reported that the mortality rate in patients with cirrhosis after emergent abdominal surgery was 50%, compare 18% for elective surgery (p = 0.001).⁶

The more extent of liver dysfunction the more higher mortality rate risk. Garrison reported, liver cirrhosis patients who underwent surgery with prothrombin time was greater than that of control. Fourty seven percent of all patients died compared to only 7% when prothrombin time was less than or equal to control value. Patients who underwent emergency procedure 57% died compare to only 10% who did not undergo emergency surgery. Still in the same study, mortality rate in cirrhosis patients with Child classification A was 10%, Class B was 31% and Class C was 76%.²

There is no specific tool to estimate the extent of liver dysfunction. Conventional biochemical markers of hepatobiliary disease correlate poorly with degree of hepatic dysfunction because of the lack of individual specificity.⁷ The most commonly used approach for prediction of perioperative risk is based on the system developed by Child and Turcotte. Child's class is accurate preoperative predictive factor in cirrhosis patients. Now, the Child-Pugh score is used to predict perioperative morbidity and mortality rates for patients undergoing intra-abdominal surgery. It incorporates a combination of 3 biochemical elements (i.e. prothrombin time, albumin dan bilirubin level), and 3 clinical features (i.e. nutritional state, presence of ascites and encephalopathy) to assess primary functions of the liver.^{2,4,8}

Liver have has multiple function, as site of protein synthesis, metabolism of nutrients and drugs, excretion and detoxification of endogenous toxins and exogenous agent. Liver damage in cirrhosis patients

may cause several hemodynamic, hematological, metabolic and other abnormalities. Several pathophysiological factors contribute to increased perioperative mortality in patients with liver disease. A hyperdynamic state with increased cardiac output, decreased systemic vascular resistance and increased intravascular volume is typical in cirrhosis. Renal blood flow tends to decrease, and renal failure may develop in patients with portal hypertension and ascites (the hepatorenal syndrome). Local hepatic autoregulation of arterial blood flow is impaired, making cirrhosis liver less tolerant of hemodynamic changes. These alterations render the cirrhotic liver more vulnerable to hemorrhage, hypovolemia, hypotension and hypoxemia.⁹

Several studies have shown that both regional and general anesthetic procedure may decrease hepatic blood flow as a result of systemic vasodilatation and slightly negative inotropic effect.^{7,10} Stress due to surgery, with concomitant catecholamine release and neurohormone responses, may also induce changes in liver hemodynamics that lead to hepatic dysfunction. The greater the degree of hemorrhage with surgery, the greater the fall in hepatic blood flow and change of ischemic injury to the liver.^{7,11}

Liver disease is associated with a wide range of abnormalities of coagulation system. Thrombocytopenia, coagulation factor abnormalities and disseminated intravascular coagulation (DIC) may be induced severe bleeding. These are the factors that contribute to defective hemostasis in patients with liver disease: decreased synthesis of procoagulant anticoagulant proteins, impaired clearance of activated coagulation factors, nutritional deficiency e.g. vitamin K, folate, splenomegaly (portal hypertension), qualitative platelet defects and bone marrow suppression of thrombopoiesis.¹²

As the liver is a major site of drug metabolism, alterations in hepatic function may result in a prolonged duration of action of agents that are predominantly metabolized by this organ. Drugs such as sedatives or narcotic analgetics that affect the central nervous system may precipitate hepatic encephalopathy. In patient with liver cirrhosis the drug clearance may be decreased. The metabolism of the benzodiazepine sedative and regional anesthetic agents can be prolonged.¹

All synthetic functions of the liver are depressed in cirrhosis. Hypoalbuminemia is common and wound healing is delayed. Glucose utilization is impaired and increased plasma levels of growth hormone and glucagon induce glucose intolerance. Decreased elimination of ammonia and other neurotoxin may cause encephalopathy. The hypoglobulinemia is associated with an impaired immune defense system and

elevated risk of post-operative infections.⁹

It has been shown that converting Child C patient to Child B preoperatively improved survival after surgery.¹³ Hence, proper perioperative evaluation and management which addressed the common features of advanced liver disease may decrease the risk of complications or death following surgery. Before surgery, particularly attention should be paid to the management of coagulation status, renal function, fluid and electrolyte, malnutrition, encephalopathy and ascites.^{7,8,14,15}

Coagulopathy and thrombocytopenia should be corrected with replenishment of vitamin K, administration of fresh-frozen plasma (FFP), and possibly cryoprecipitate transfusion are recommended to reduce a prothrombin time within 3 seconds of normal time and to achieve a goal of platelet counts of $> 50,000/\text{mm}^3$.

The presence of ascites may influence respiratory mechanics and risk of abdominal wound dehiscence. In general, ascites should be treated aggressively with diuretic and or large-volume paracentesis with albumin if necessary before surgery. Infection, diuretics, metabolic alkalosis, constipation, use CNS depressants, hypoxia, sepsis, azotemia, or gastrointestinal bleeding in the pre/postoperative periods may induce encephalopathy. Correction of electrolyte abnormalities, treatment of infection, branched chain amino acid therapy, and gastrointestinal bleeding, and restriction of sedatives help prevent encephalopathy. Malnutrition is common in patients with cirrhosis. Enteral or parenteral nutrition may be helpful in improving the patient's Child class and in reducing mortality in those with cirrhosis and malnutrition.

Prevention of renal dysfunction, careful attention to volume status, and to avoid nephrotoxic agents are critical points to prevent hepatorenal syndrome. In patients with cirrhosis, liver failure is the most common cause of post-operative mortality. Hepatocellular injury is most commonly due to the effects of anesthesia, intraoperative hypotension, sepsis, or viral hepatitis. So, in the post-operative period, the patients must be observed closely for signs of acute hepatic decompensation, such as worsening jaundice, encephalopathy, and ascites. The prothrombin time and serum bilirubin level are probably the best measures of hepatic function. Renal function should be monitored as well because of the risk of hepatorenal syndrome. Serum glucose levels should be followed closely, because hypoglycemia often accompanies post-operative liver failure.

In this case, patient died caused by encephalopathy and hepatorenal syndrome. The problem was not only the patient was at high risk of mortality rate, but also

post-operative monitoring had not been done optimally. Patients was permitted to discharge from hospital because his condition was apparently good.

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