

Partial Cholecystectomy: A Technique That Makes Hilar Dissection Easier in Recipient Hepatectomy

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ABSTRACT

Background. Intraoperative blood loss and red blood cell transfusion requirements have a negative impact on outcome after orthotopic liver transplantation. In this study we compared blood transfusion requirements, bile duct injury, and dissection of hepatic artery rates in the patients with or without partial cholecystectomy during recipient hepatectomy.

Methods. From December 2008 to August 2011, 100 recipient hepatectomies were performed by the same surgeon. Patients were divided into 2 groups. The first group included patients with partial cholecystectomy, and the other group patients without partial cholecystectomy. Each group consisted of 50 patients.

Results. In recipient hepatectomy group without partial cholecystectomy, intraoperative blood transfusions were in the range of 3–11 units (mean, 6.3 units). In this group there were 4 hepatic artery dissections and 2 bile duct injuries. In the group with partial cholecystectomy, intraoperative blood transfusions were in the range of 0–7 units (mean, 3.1 units). In this group there was 1 hepatic artery dissection. There were no operative mortalities in either group.

Conclusions. We recommend partial cholecystectomy during recipient hepatectomy of cirrhotic patients, particularly with hydropic gallbladders, because bleeding from the points of adherent gallbladder during mobilization of the liver is diminished and fewer artery dissections and bile duct injuries develop, because the procedure facilitates dissection of the hilar structures.

LIVING-DONOR LIVER transplantation (LDLT) has gained worldwide acceptance as an effective therapy for end-stage liver disease. LDLT was developed in an attempt to increase the pool of donor organs, offering at the same time a graft in excellent condition with short ischemia times [1,2]. Several studies have shown that intraoperative blood loss and red blood cell transfusion requirements have a negative impact on outcome after orthotopic liver transplantation [3]. Similarly, intraoperative bile duct injury and dissection of hepatic artery also increase morbidity and mortality rates following liver transplantation.

In this study, we compared blood transfusion requirements, bile duct injury, and dissection of hepatic artery rates in the patients with or without partial cholecystectomy during recipient hepatectomy.

METHODS

From December 2008 to August 2011, 100 recipient hepatectomies were performed by the same surgeon. Preoperative recipient

evaluation included clinical assessment, blood type verification, complete blood count, and coagulation profile. Imaging by abdominal ultrasonography, hepatic Doppler ultrasonography, and computerized tomography were performed on cirrhotic patients. Patients were divided into 2 groups. The first group included patients with partial cholecystectomy, and the other group patients without partial cholecystectomy. Each group consisted of 50 patients.

Most of the patients in the partial cholecystectomy group had hydropic gallbladders. In the partial cholecystectomy group the recipient hepatectomy involved several steps. First, partial cholecystectomy was performed to delineate the hepatoduodenal structures (Figs 1 and 2). Next, bile duct, hepatic artery, and portal vein were dissected. Then the falciform, triangular, and hepatogastric

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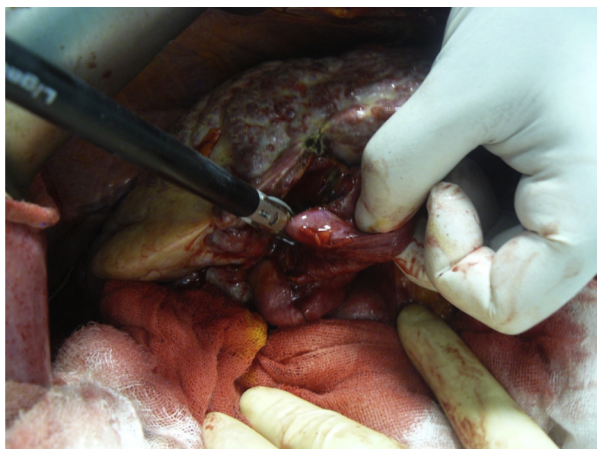


Fig 1. Partial cholecystectomy performed with the use of Ligasure.

ligaments were divided with the use of a bipolar electrothermal vessel sealing system (Ligasure; Valleylab, Covidien, Boulder, Colorado). Between the liver and inferior vena cava, the hepatic and caudate veins were tied and divided.

Partial Cholecystectomy Technique

First, the bile was aspirated from the gallbladder before the surgical procedure by opening a small orifice at the fundus of the gallbladder to not contaminate the peritoneal cavity. Whenever we observed the contamination of bile to the peritoneal cavity, we limited the contamination by compresses and irrigated the contaminated area with saline and aspirated the collection. Then partial cholecystectomy was performed with the use of 10-mm Ligasure, leaving the posterior wall of the gallbladder in its place.

Following cholecystectomy, the bile duct, hepatic artery, and portal vein were isolated and each encircled with vessel loops. Then the inferior vena cava was accessed after division of the falciform, hepatogastric, and triangular ligaments with the use of Ligasure medially and laterally. The suprahepatic vena cava was isolated totally and retrohepatic veins and caudate vein were ligated and divided. The stumps of the divided retrohepatic veins were also sutured with 5/0 or 6/0 Prolene. After clamping of the portal vein, first the right hepatic vein and then the left hepatic vein were clamped and divided. Finally, the bile duct, hepatic arteries, and portal vein were divided intrahepatically and recipient hepatectomy was completed.

In the group without partial cholecystectomy, after division of the hepatoduodenal ligament medially and laterally, the bile duct and right and left hepatic arteries were divided. The portal vein was divided at the end of the operation. In this group, the right and left hepatic veins were clamped and divided after division of the hilar structures. The suprahepatic vena cava was also isolated totally. In both groups, the stump of the left hepatic vein was sutured with 4/0 Prolene. There were no technical differences regarding the hepatectomy between the groups except partial cholecystectomy.

RESULTS

Of the 50 recipients who underwent partial cholecystectomy during liver transplantation, 28 were men and 22 were women. The mean age was 40 years (range, 28–60). In the recipient



Fig 2. Cirrhotic liver and partial cholecystectomy.

hepatectomy group without partial cholecystectomy, 26 were men and 24 were women. Their mean age was 42 years (range, 25–65). In the recipient hepatectomy group without partial cholecystectomy, intraoperative blood transfusions were ranged from 3 to 11 units (mean, 6.3 units). In this group there were 4 hepatic artery dissections and 2 bile duct injuries. In the group with partial cholecystectomy, intraoperative blood transfusions were ranged from 0 to 7 units (mean, 3.1 units). In this group there was 1 hepatic artery dissection. There were no infectious complications in both groups. There were no operative mortalities in either group.

DISCUSSION

The main cause of blood loss in the group without partial cholecystectomy was bleeding from the bed of the gallbladder and capsular bleeding from the adherent points of gallbladder during mobilization of the liver, particularly in patients with hydropic gallbladder. Also, hepatoduodenal dissection was difficult in this group, and this difficulty led to bleedings from collaterals, portal vein, and hepatic arteries, resulting in increased blood loss. While attempting to control these bleedings, intimal injury resulted in undesirable hepatic artery dissection.

When we do not perform partial cholecystectomy, especially in patients with hydropic gallbladders, the dissection of the hilar structures can be difficult because of bleeding. We have also observed that if the surgeon does not need to cope with the unnecessary bleeding, less hepatic artery dissection occurs.

Bile duct injury and hepatic artery dissection were the main complications except bleeding in both groups. These main complications occurred less commonly in the partial cholecystectomy group. Infectious complications, such as biliary peritonitis and biliary abscess, were not observed in either group. We took some precautions for infectious complications. In the partial cholecystectomy group, the bile was aspirated from the gallbladder before the surgical procedure. Whenever we observed contamination of the bile to

the peritoneal cavity, we limited the contamination by compresses and irrigated the contaminated area with saline and aspirated the collection. Also, each patient received prophylactic antibiotherapy.

In conclusion, we recommend partial cholecystectomy during recipient hepatectomy of cirrhotic patients, particularly with hydropic gallbladder, because bleedings from the points of adherent gallbladder during mobilization of the liver is diminished and fewer artery dissections and bile duct injuries develop, because the procedure facilitates dissection of the hilar structures.

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