

Two Cases of Common Bile Duct Stone After Liver Transplantation

Biliary complications after orthotopic liver transplants are a continuing cause of morbidity and mortality. Biliary stones and sludge are less well known complications of hepatic transplantation, although they have long been recognized. Recently we experienced two cases of biliary stones developed after liver transplantation. One 32-year-old male, who frequently admitted due to recurrent cholangitis, was treated with percutaneous transhepatic biliary drainage and choledochojunostomy with cholecystectomy. The other 58-year-old male, who had stones in common bile duct, was treated by endoscopic manipulation. They are in good condition without recurrent bile duct stones or its accompanying complications. Although stones and sludge are relatively infrequent after liver transplantation, surgical or interventional radiologic treatments are usually performed for treatment.

Key Words : Transplantation; Liver; Cholangitis; Cholelithiasis; Common bile duct

Byung Hun Byun, Seong Won Lee,
Si Hyun Bae, Jong Young Choi,
Dong Goo Kim*, Jae Young Byun*,
Young Min Park, Doo Ho Park,
Boo Sung Kim

Departments of Internal Medicine, Surgery* and
Radiology†, Kangnam St. Mary's Hospital, The
Catholic University of Korea, College of Medicine,
Seoul, Korea

Received : 1 April 1998
Accepted : 10 August 1998

Address for correspondence

Young Min Park, M.D.
Department of Internal Medicine, Kangnam St.
Mary's Hospital, The Catholic University of Korea,
College of Medicine, 505 Banpo-dong, Seocho-gu,
Seoul 137-040, Korea
Tel : +82.2-590-1425, Fax : +82.2-536-9559

INTRODUCTION

Over the past two decades, advances in organ preservation, immunosuppressive agents, and refinement of surgical techniques have lead to a dramatic improvement in the survival rate of patients after liver transplantation. Despite improvements, the occurrence of biliary complication is still in the range of 15-25% (1). Moreover, biliary complications after liver transplantation attribute to increased mortality and graft loss (1-4). Timely diagnosis and proper treatment can markedly decrease the morbidity and mortality rate associated with biliary tract complications after liver transplantation (3, 5).

CASE REPORT

Case 1

A 32-year-old man was admitted with fever, chill, and right upper quadrant pain. He had undergone a liver transplantation 2 years ago. The past history of this patient showed that he was admitted for multiple liver abscess accompanied by acute cholangitis 1 year ago, and recurrent cholecystitis with cholangitis 1 month ago.

On admission, his temperature was 38°C, pulse rate 102

per minute, respiration rate 24 per minute, and blood pressure was 110/60 mmHg. His mental status was alert and sclerae were icteric. Abdominal palpation revealed right upper quadrant tenderness but neither liver nor spleen was palpated.

The laboratory evaluations were as follows: hemoglobin was 10.1 g/dL, hematocrit was 30 percent and the platelet count was 50,000/ μ L on complete blood count. The fasting blood sugar was 225 mg/dL, the blood urea nitrogen was 29.9 mg/dL, and creatinine was 2.08 mg/dL. Total protein was 6.5 g/dL, albumin 4.1 g/dL, prothromin time 100 percent, total bilirubin 3.6 mg/dL, direct bilirubin 1.5 mg/dL, γ -glutamyltranspeptidase 403 IU/P, alkaline phosphatase 773 IU/L, aspartate aminotransferase 271 IU/L, alanine aminotransferase 112 IU/L, total cholesterol 142 mg/dL, and triglyceride 124 mg/dL on blood chemistry. Hepatitis B surface (HBs) antigen was negative, anti-HBs antibody was positive (titer 4.0), and anti HCV Ab was negative on an immunology work up.

To control infection before defining organism, he was administered sulperazone intravenously. However, fever was not controlled. Abdominal sonography showed intrahepatic and common bile duct dilatation with stones (Fig. 1). Abdominal computed tomography revealed a focal dense nodular opacity at the common hepatic duct with tubular low density lesion, suggesting bile duct dilatation (Fig. 2).

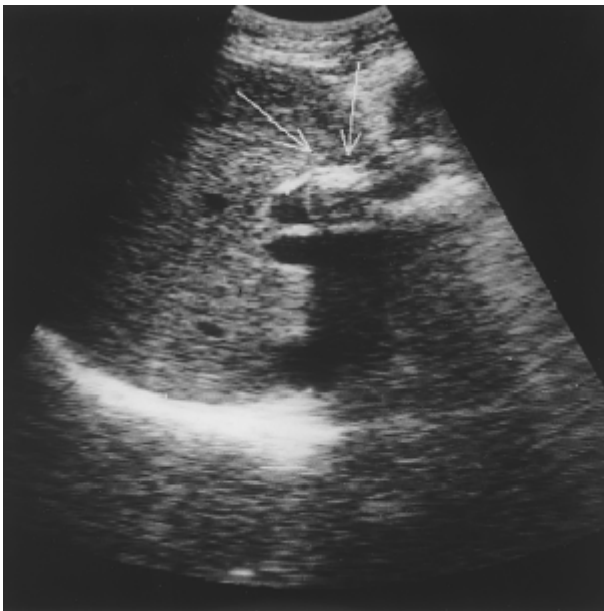


Fig. 1. Abdominal ultrasonogram shows focal nodular echogenic lesion with acoustic shadowing and proximal ductal dilatation at common hepatic duct (Case 1).



Fig. 2. Abdominal computed tomography shows focal dense nodular opacity at the common hepatic duct with tubular low density lesion, suggesting bile duct dilatation (Case 1).

To know location of stone and cause of biliary obstruction, percutaneous transhepatic cholangiography (PTC) was performed. Cholangiogram showed round shaped filling defects and nearly total obstruction in proximal common bile duct

(Fig. 3). Because the method of biliary reconstruction in this case was cholangiocholedochostomy, biliary anastomosis site was above cystic duct bifurcation. During PTC, hypotension and deterioration of mentality suddenly devel-

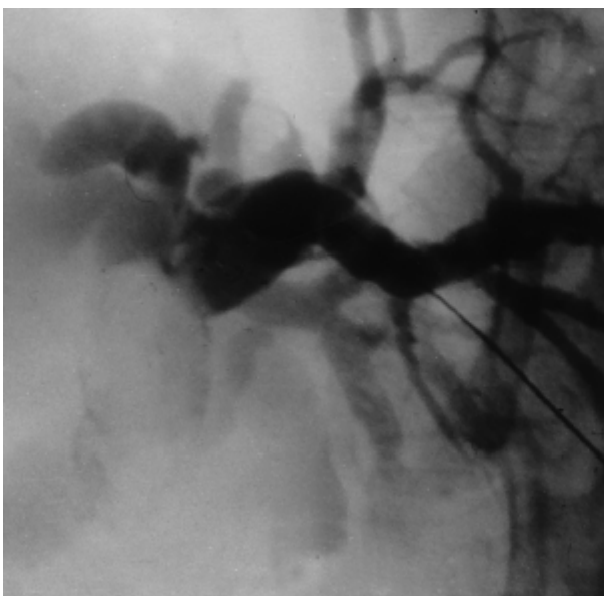


Fig. 3. Percutaneous transhepatic cholangiography shows focal large filling defect with peripheral linear contrast filling at the common hepatic duct and proximal intrahepatic bile duct dilatation (Case 1).

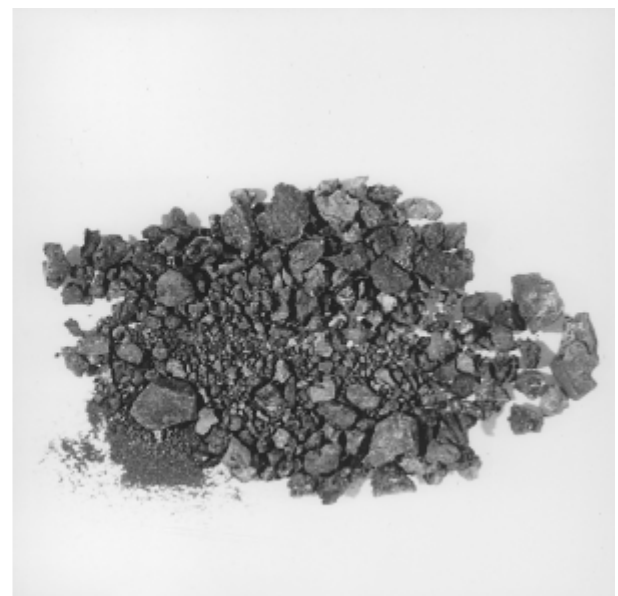


Fig. 4. This picture shows large amount of muddy stones removed during the operation (Case 1).



Fig. 5. Abdominal computed tomography shows mild dilatation of intrahepatic bile duct (Case 2).

oped. To decompress the biliary pressure, percutaneous transhepatic biliary drainage (PTBD) was performed. After that, vital sign and mentality became stable. He had emergency operation. Operative finding showed markedly narrowing in biliary anastomosis site of proximal common bile duct (CBD). And sludge, multiple stones (Fig. 4) were found above narrowing site. After removal of stone, biliary reconstruction was performed. Finally, his condition improved without recurrent bile duct stones.

Case 2

A 58-year-old man had been admitted due to progressive hepatic failure. He had undergone orthotopic liver transplantation due to progressive hepatic failure associated with hepatitis B virus infection. After orthotopic liver transplantation, physical examination was normal except for icteric sclerae. Liver function tests were normal except for the high level of bilirubin.

On postoperative 14th day, he showed sustained hyperbilirubinemia as total bilirubin 11.1 mg/dL. There was mild dilatation of the intrahepatic bile duct shown by abdominal computed tomography (Fig. 5). To rule out biliary complications inducing cholestasis, T-tube cholangiogram was performed. Single oval-shaped stone was found in distal common bile duct. After endoscopic retrograde cholangiography (Fig. 6), a stone in the distal portion of common bile duct was removed with endoscopic sphincterotomy. After removal of stone, the level of serum bilirubin gradually decreased to

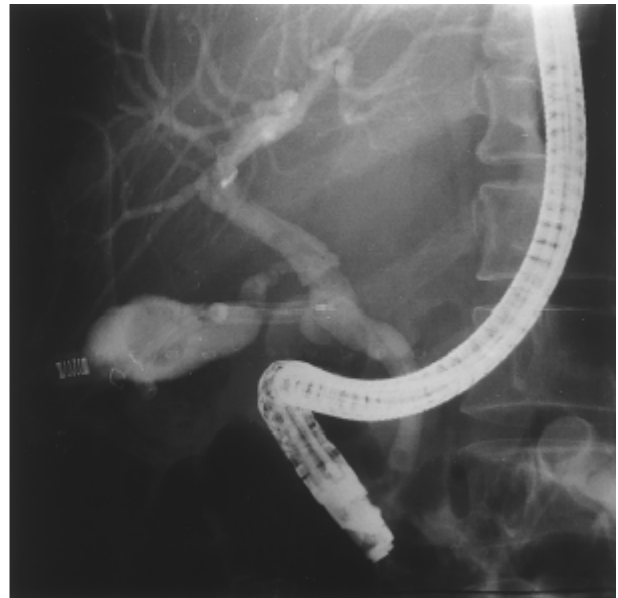


Fig. 6. Endoscopic retrograde cholangiography shows focal small filling defect at the distal portion of common bile duct (Case 2).

normal level.

DISCUSSION

The success rate of liver transplants has been improved recently, but we still find cases of high morbidity and mortality after liver transplantation. Recently, authors reported that the predictive factors affecting outcome of orthotopic liver transplantation (OLT) were the reserve of liver function and performance status of patients at the time of OLT. After solving the recipients factors, other factors such as donor liver state, surgical factor should be considered. Among them, biliary complications have been known to be a significantly attribute to postoperative morbidity and mortality. The reported rate of biliary complication is in 13-34% range (1, 2). They usually include stenosis of bile duct, leakage of anastomotic site, and wrong placement of T-tube (drainage tube) for bile drainage. Complications of bile leakage usually occur early, necessitating endoscopic or operative manipulation to prevent the sepsis. Those of biliary stricture appear late, and need operations (6).

In one case of this report, recurrent cholangitis developed for one and half year after OLT. Its cause was multiple stones and the stricture of anastomosis. However, we could not find the causating factor inducing biliary stricture in this case. This stricture was suggested to be result from ischemia in biliary anastomosis site primal to cystic duct. Usually, biliary stricture occurs with the presence of injuries in the

bile duct, which developed in the proximal portion from cystic duct three times as frequent as in the distal portion (9). So far, the ischemic type biliary strictures usually appear from 1 month to 4 months after liver transplantation (13). These have been associated with ABO-incompatible grafts, chronic rejection and extended presentation, but other unrecognized causes of biliary ischemia are certainly important (13, 14). Once, ischemic biliary strictures progress for several months, it finally tends to become a biliary obstruction (15).

In another case which had stone in common bile duct on 2 weeks post-operative day, we didn't know why biliary stone was found within 2 weeks after OLT, because common bile duct stone was not noticed at the time of OLT. Therefore, this stone cannot be ruled out to be before OLT.

The causes of biliary tract complications are considered to be the thromboses in hepatic arteries, ABO incompatible allografts, chronic rejection, cytomegalovirus infection, long ischemic time and preexisting sclerosing cholangitis (3, 7, 8). And ischemia due to late thromboses in hepatic arteries also causes it (10). However, the use of immunosuppressive agents such as azathioprine and cyclosporin suppress the tension of the injuries, and decrease the likelihood of stricture formation (11). Recently, research showed that there is a close relation between prolonged ischemic time in graft and the formation of stricture (12).

The diagnosis of biliary tract complications is a composite workup based on nonspecific clinical presentation (fever, ileus, ascites, jaundice, right upper quadrant pain), laboratory abnormalities (leukocytosis, elevation in bilirubin or hepatocellular enzyme), ultrasonography (biliary dilatation, fluid collections, vascular patency), histopathologic condition (cholestasis, cholangitis, absence of rejection), biliary visualization either by T tube cholangiography, endoscopic retrograde cholangiopancreatography (ERCP), percutaneous transhepatic cholangiography (PTC), or at operation (3).

Most biliary complications occur in the first week after transplantation and the differential diagnoses include rejection, primary graft dysfunction, and drug toxicity (16). Therefore, one can perform abdominal ultrasonography and Doppler scanning to confirm the patency of hepatic artery and portal vein. Ultrasonography can also show fluid collections or biliary dilatation, but ultrasonography is not particularly accurate for the early detection of biliary complications after liver transplantation (17). For this reason, cholangiography should be used first in transplant patients who have suspected biliary complications (7).

Once the diagnosis of a biliary tract complication is established, one must start specific therapies. Therapeutic options include operative and non-operative approaches such as medical, percutaneous, and endoscopic managements. When bile duct complications develop, the conventional treatment of biliary stricture resulting from small sized liver

transplantation and vascular thrombosis, is percutaneous stent placement (13). In general, during liver transplantation, either choledochocholedochostomy or Roux-en-Y anastomosis is performed for biliary reconstruction. The complications, including bile leak, of Roux-en-Y operation usually occurs early, necessitate operative intervention, and have greater morbidity, whereas those of choledochocholedochostomy occur later and are more accessible to percutaneous or endoscopic manipulations (3). The incidence of biliary stricture is about 4%, and more frequent in Roux-en-Y anastomosis (7). Because the first patient received Roux-en-Y biliary anastomosis, he was operated on for the removal of common bile duct stone and then we performed choledochojejunostomy. In the second having choledochocholedochostomy, we can remove the stones by using endoscopic sphincterotomy.

Biliary complications after the liver transplantation have been reported infrequently. Because this induce the high morbidity and mortality in OLT patients, early and accurate diagnosis should be needed by using interventional radiologic method. We reported two case of biliary stones occurring among total 22 liver transplant recipients of our institution.

REFERENCES

1. Hiatt JR, Quinones-Baldrich WJ, Ramming KP, Brems J, Busuttil RW. *Operations upon the biliary tract during transplantation of the liver.* *Surg Gynecol Obstet* 1987; 165: 89-93.
2. Lerut J, Gordon RD, Iwatsuki S, Esquivel CO, Todo S, Tzakis A, Starzl TE. *Biliary tract complications in human orthotopic liver transplantation.* *Transplantation* 1987; 43: 47-51.
3. Stratta RJ, Wood RP, Langnas AN, Hollins RR, Bruder KJ, Donovan JP, Burnett DA, Lieberman RP, Lund GB, Pillen TJ, Markin RS, Shaw BW. *Diagnosis and treatment of biliary tract complication after orthotopic liver transplantation.* *Surgery* 1989; 106: 675-84.
4. Krom RA, Kingma LM, Haagsma EB, Wesenhagen H, Slooff MJ, Gips CH. *Choledochocholedochostomy, a relatively safe procedure in orthotopic liver transplantation.* *Surgery* 1985; 97: 552-6.
5. Letourneau JG, Hunter DW, Payne WD, Day DL. *Imaging of and intervention for biliary complications after hepatic transplantation.* *Am J Roentgenol* 1990; 154: 729-33.
6. O'Connor TP, Lewis WD, Jenkins RL. *Biliary tract complications after liver transplantation.* *Arch Surg* 1995; 130: 312-7.
7. Zajko AB, Cambell WL, Logsdon GA, Bron KM, Tzakis A, Esquivel CO, Starzl TE. *Cholangiographic findings in hepatic artery occlusion after liver transplantation.* *Am J Roentgenol* 1987; 149: 485-9.
8. Colonna JO, Shaked A, Gomes AS, Colquhoun SD, Jurim O, McDiarmid SV, Millis JM, Goldstein LI, Busuttil RW. *Biliary strictures complicating liver transplantation: incidence, pathogenesis, man-*

- agement, and outcome. *Ann Surg* 1992; 216: 344-52.
9. Csendes A, Diaz JC, Burdies P, Maluenda F. Late results of immediate repair in accidental section of the common bile duct. *Surg Gynecol Obstet* 1989; 168: 125-30.
 10. Terblanche J, Worthley CS, Spence RAJ, Krige JEJ. High or low hepaticojejunostomy for bile duct strictures? *Surgery* 1990; 108: 828-34.
 11. Eisinger DR, Sheil AGR. A comparison of the effects of cyclosporin A and standard agents on primary wound healing in the rat. *Surg Gynecol Obstet* 1985; 160: 135-9.
 12. Sanchez-Urdazpal L, Gores GJ, Ward EM, Maus TP, Wahlstrom HE, Moore SB, Wiesner RH, Krom RA. Ischemic-type biliary complications after orthotopic liver transplantation. *Hepatology* 1992; 16: 49-53.
 13. Sanchez-Urdazpal L, Gores GJ, Ward EM, Maus TP, Buckel EG, Steers JL, Wiesner RH, Krom RAF. Diagnostic features and clinical outcome of ischemic-type biliary complications after Liver transplantation. *Hepatology* 1993; 17: 605-9.
 14. Ward EM, Kiely MJ, Maus TP, Wiesner RH, Krom RAF. Hilar biliary strictures after liver transplantation: Cholangiography and percutaneous treatment. *Radiology* 1990; 177: 259-63.
 15. Zajko AB, Bron KM, Cambell WL, Behal R, Van Thiel DH, Starzl TE. Percutaneous transhepatic cholangiography and biliary drainage after liver transplantation: a five-year experience. *Gastrointest Radiol* 1987; 12: 137-43.
 16. Tzakis AG, Gordon RD, Shaw BW, Iwarsuki S, Starzl TE. Clinical presentation of hepatic artery thrombosis after liver transplantation in the cyclosporin era. *Transplantation* 1985; 40: 667-71.
 17. Zemel G, Zajko AB, Skolnick ML, Bron KM, Campbell WL. The role of sonography and transhepatic cholangiography in the diagnosis of biliary complication after liver transplantation. *Am J Roentgenol* 1988; 151: 943-6.