CASE REPORT

Delayed diagnosis and successful management of completely transected common hepatic duct in a blunt multitrauma patient

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ABSTRACT

Extrahepatic bile duct injuries are very uncommon and easily be missed in multitrauma patients. Patients suffer from bile duct injuries need special approach to this situation. In this report, a case with total transection of common hepatic duct and treatment approach was presented. In unstable patients, damage control surgery can be applied. A 32-year-old male patient was brought to the emergency department after a beating that includes multiple blunt trauma. Radiological screening showed cranial, nasal, lumbar vertebral, and costal bone fractures, decreased blood flow to the right kidney and free perihepatic and perisplenic fluid. Neurosurgeons operated this patient at the day of admission and no plan for laparotomy was made for this patient at that time. Second day postoperatively patient was transferred to the department of surgery and exploratory laparotomy has been made. Common hepatic duct was fully transected and because of the patient's hemodynamic instability, an external fistula has been made. The patient discharged 10th day postoperatively. The patient was operated after follow-up and a Roux-en-y hepaticojejunostomy has been made. Extrahepatic bile duct injuries are rare and high suspicion is important in complex multitrauma patients. Extent of the injury is unique for every patient and technical aspect of repair can be challenging.

Keywords: Abdominal injuries; common hepatic duct; hepaticostomy.

INTRODUCTION

Extrahepatic biliary injuries caused by blunt trauma are very rare. Gallbladder is the most common affected site after trauma as an extrahepatic biliary organ but common biliary duct and hepatic ducts can be affected.[1,2] Extrahepatic biliary injuries after blunt trauma can be easily missed, especially when they have seen with other injuries.[3] Late findings after admission such as jaundice, fever, slightly increased abdominal pain, tenderness, and radiological findings like increased fluid in the abdomen can increase the suspicion about extrahepatic biliary injuries. Injuries to the extrahepatic biliary ducts can be partial or total and this changes how to approach to the injury.[4] In this report, a case with total transection of common hepatic duct and treatment approach was presented. In unstable patients, damage control surgery can be applied.

CASE REPORT

A 32-year-old male patient was admitted to the emergency department after a beating including multiple blunt trauma. There was no penetrating injury. Glasgow Coma Scale score was 10 during admission. The patient's vital signs; heart rate was 95, blood pressure was 120/80 mmHg. The patient had a loss of consciousness during trauma and had no nausea or vomiting after trauma. The patient had a complaint of pain on bilateral upper quadrants but there were no abdominal tenderness, rebound tenderness, or abdominal rigidity. He had

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no hematuria. The patient had a leukocytosis at the level of 30.000×10^6 /ml, and hemoglobin level was 14.8 g/dl. Aspartate aminotransferase (AST) was 496 U/l, alanine aminotransferase (ALT) was 940 U/l, direct bilirubin was 0.44 mg/dl, total bilirubin was 0.82 mg/dl. A computed tomography (CT) scan was undergone (Fig. 1a) with IV contrast material, the patient had right parietal bone depression fracture, free perihepatic fluid, and free perisplenic fluid suspected as splenic laceration. After 4 h of observation, another abdominal CT scan (Fig. 1b) were undergone along with cranial CT and abdominal imaging showed increased perihepatic fluid, heterogeneous appearance at falciform ligament, and focal enlargement and mural thickening at the second and third part of the duodenum. General surgery team decided to follow the patients with an initial diagnosis of bleeding from liver due to laceration. Neurosurgeons decided to operate the patient, and postoperatively, the patient had followed by neurosurgeons at the neurosurgical intensive care unit.

At the 1st day after surgery, the patient had decreased pain on abdomen and his leukocyte count decreased to $15,800\times10^6$ /ml. AST had become 2265 U/l, ALT had become 2224 U/l. Hgb was 9.5 g/dl. At the 2nd day, the patient has been evaluated by general surgery team, he had tachycardia, tenderness on four quadrants of abdomen and total bilirubin was 24.63 mg/dl (serum total bilirubin was 8.69 mg/dl), direct bilirubin was 10.8 mg/dl (serum direct bilirubin was 5.7 mg/dl), urea was 48 mg/dl (serum urea was 39 mg/dl), creatinine was 0.93 mg/dl (serum creatinine was 1.08 mg/dl), and amylase was 214 U/l (serum amylase was 310 U/l). Inability to identify biliary leakage level, abdominal tenderness, and rigidity of the patient led us to exploratory laparotomy.

During laparotomy, all intestines were covered with bile and there was free bile in abdomen. There was no gastric or intestinal perforation. During exploration on hepatoduodenal ligament, common hepatic duct has been found fully transected at the level of 1 cm distal to bifurcation of common hepatic duct (Bismuth type 2 or Strasberg type E2 injury). Cholecystectomy had completed. Because of the instability of patient and inflammation on the tissues, surgical team decided to wait for hepaticojejunostomy. A drain was placed to common hepatic duct to stop bile leakage. Multiple drains had placed inside the abdomen and operation ended. After the operation, the patient followed up at the general surgery ward and his general condition went well. Abdominal drains were removed day by day. The patient was discharged postoperatively 10th day. One month later from operation, biliary drain was changed for percutaneous biliary drainage, the patient did not follow his regular appointments for almost 1 year and continued with percutaneous drain. The patient accepted second operation and Roux-en-Y hepaticojejunostomy had applied. The patient discharged postoperatively 10th day with full recovery.

DISCUSSION

Extrahepatic biliary injuries caused by blunt trauma are rare and mostly caused by penetrating injuries and mostly to gallbladder.[1,2,5,6] After blunt trauma, many other injuries in addition to extrahepatic biliary injuries can be seen and this situation can cause missing of biliary injuries. There must be increased suspicion if there is no intestinal or solid organ injuries but free fluid in the abdomen during radiological examination. Bile duct injuries may be challenging to diagnose both radiologically and intraoperatively. Missed bile duct injuries may cause significant complications and in upper abdominal injuries possibility of biliary injuries should be taken into consideration.[7,8] Early diagnosis can change the approach for the treatment.[4,7,8]

Several theories about mechanism of injury have been stated in literature. Melton et al.[9] have mentioned that shearing force and tension between liver and hepatoduodenal ligaments during deceleration as the primary source of damage.

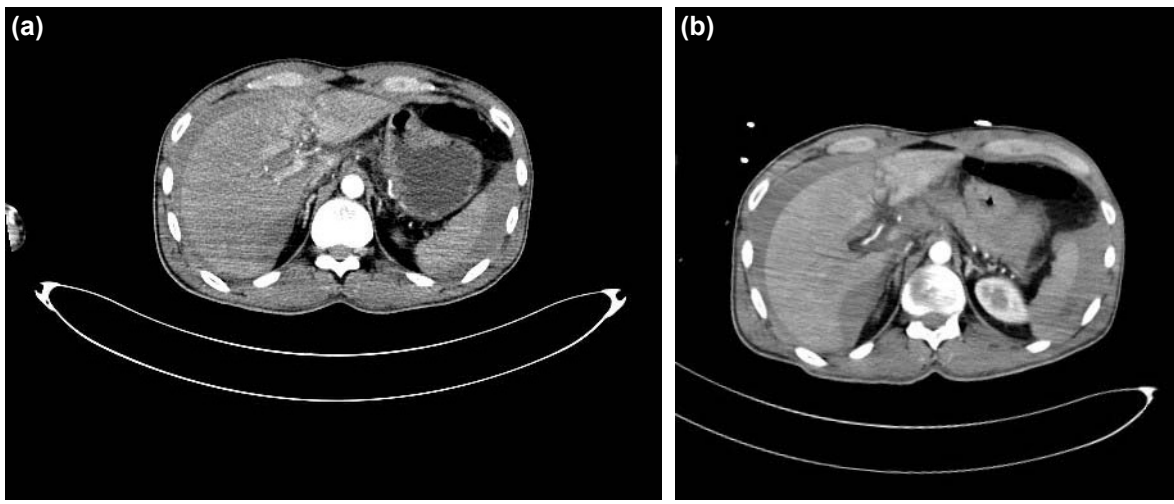

Figure 1. (a) An abdominal computed tomography scan image which acquired during admission. Image shows perihepatic fluid but no free air inside of abdomen. **(b)** An abdominal computed tomography scan image which acquired 4 h after admission. Image shows increased perihepatic fluid.

Further, mechanisms of injury have been hypothesized in four factors in various articles; shear force or tension that cause tearing at its attachment points in pancreas and liver, a short cystic duct which prone to injury with accelerated emptying of gallbladder during trauma, applying shearing force to the common bile duct which is already tensioned, and compression of extrahepatic bile ducts against vertebral column.[4,10]

Injuries of extrahepatic biliary ducts can be total or partial. In total transection, especially in hemodynamically unstable patients, exteriorization of bile through T-tube or a terminal drain helps us to identify injury site for the subsequent operation. In hemodynamically stable patients, a hepaticojejunostomy, choledocojejunostomy, or choledochoduodenostomy can be achieved. In partial injuries, if injury is <50% of the circumference of common bile duct, primary repair, stenting with ERCP can be performed. If injury is more than 50% of circumference of common bile duct, correct treatment method is not clear. In simple transection, end-to-end anastomosis may be performed but if there is a loss of tissues, then hepaticojejunostomy must be performed.[4,5,6,11]

In this case, the patient had cranial and kidney trauma and these ones were the obvious injuries which caused that biliary trauma has been missed. Free fluid in the abdomen could have been sampled before deciding not to do anything. During surgical intervention by neurosurgeons, concomitant abdominal surgery could possibly have been done but free fluid in the abdomen might have been caused confusion about differential diagnosis by the surgeons or radiologist on-call. Learning point in this case is, free fluid without free air can be caused by bleeding but another possibility is bile leakage. This case shows us the importance of diagnostic peritoneal lavage before deciding not to do anything, especially in this kind of patients. Early diagnosis of transection could have been possible and one-stage surgery could have cured the bile leakage before severe abdominal contamination. The patient had symptoms such as fever, jaundice, abdominal pain, and tenderness and became septic just before the operation. Late diagnosis made patient hemodynamically unstable and applying a Roux-en-Y hepaticojejunostomy operation in this patient was not the first plan. Earliest treatment in this patient was biliary diversion and definitive treatment was left to the second operation. In hemodynamically unstable patients, immediate reconstruction could be dangerous.[12] Damage control surgery principles have been applied. An external biliary fistula was achieved. Roux-en-Y hepaticojejunostomy had left to the second operation.

Conclusions

Extrahepatic bile duct injuries are rare and can be easily missed in complex multitrauma patients. Extent of the injury is unique for every patient and technical aspect of repair can be challenging. Damage control surgery principles can be followed depend on patients hemodynamic status.

Informed Consent: Written informed consent was obtained from the patient for the publication of the case report and the accompanying images.

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OLGU SUNUMU - *ÖZ*

Künt multi-travma olgusunda teşhisi gecikmiş tam kat ana hepatik kanal yaralanmasının başarılı yönetimi

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Ekstrahepatik safra yolu yaralanmaları nadirdir ve çoklu travma hastalarında kolayca gözden kaçabilmektedir. Safra yolu yaralanması olan hastalar bu konuda özel bir yaklaşım ile tedavi edilmelidirler. Bu yazıda, ana hepatik kanalın tamamen ayrıştığı bir olgu ve tedavi yaklaşımı tartışıldı. Stabil olmayan hastalarda hasar kontrol cerrahisi de kullanılabilmektedir. Otuz iki yaşında erkek hasta, acil servise darp nedeniyle oluşan çoklu travma sonucu getirildi. Radyolojik görüntülemede kranyal, nazal, lumbar vertebral ve kostal kırıklar, sağ böbreğe azalmış kan akımı ve perihepatik, perisplenik sıvı mevcuttu. Bu safhada acil cerrahi düşünülmeyen hasta nöroşirürji doktorları tarafından ameliyat edildi. Takiplerinde, ameliyat sonrası ikinci günde hasta genel cerrahi kliniğine devredildi ve tanısal laparotomi uygulandı. Ana hepatik kanal tamamen ayrışmıştı ve hastanın hemodinamik olarak stabil olmaması nedeniyle hastanın safra yolunun eksternal fistül şeklinde bırakılmasına karar verildi. Hasta ameliyat sonrası 10. gününde taburcu edildi. Hastanın klinik takiplerine devam edildi ve elektif şekilde roux-n-y hepatikojejunostomi uygulandı. Ekstrahepatik safra yolları klinik olarak nadir görülmekle birlikte kompleks multitravma hastalarında bu konuda şüphelenmek gereklidir. Hasarın boyutu her hasta için özeldir ve tamir için kullanılan cerrahi teknik zorlayıcı olabilmektedir.

Anahtar sözcükler: Akut batın; ana hepatik kanal; hepatikostomi.

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