

Luiz Fernando Correa Zantut, Marcel Aufran Cesar Machado,
Paula Volpe, Renato Sérgio Poggetti, Dario Biroolini

Extrahepatic bile ducts injury: a report on 14 cases

Disciplina de Cirurgia do Trauma da Faculdade de Medicina da Universidade de São Paulo - São Paulo, Brazil

Traumatic injuries of the extrahepatic biliary tract are infrequent, occurring in approximately 0.5 % of all patients with blunt and penetrating abdominal trauma. The incidence of this injury due to blunt abdominal trauma is rare. This study reviewed patients with injuries of the extrahepatic biliary tract due to abdominal trauma over a 6-year period to determine the incidence, trauma scores, associated injuries, surgical treatment performed, complications and mortality rate. We report our experience with 14 patients with extrahepatic biliary tract trauma. A review of the literature and the discussion about the management are presented.

UNITERMS: Extrahepatic biliary tract, Injury, Abdominal trauma.

INTRODUCTION

Traumatic injuries to the extrahepatic bile ducts remain relatively rare even in the busiest trauma centers. Formerly, blunt trauma to the right upper quadrant accounted for most of the reported injuries to the bile ducts, but in recent years, penetrating trauma has been the most common cause. Because of the variable complexity of injuries, a wide variety of surgical options for repair of the bile ducts is possible. We report, herein, on our experience with patients who sustained traumatic injuries to the extrahepatic bile ducts over a six-year period.

MATERIALS AND METHODS

During the 6-year period from 1986 to 1991, 5,069 patients underwent laparotomy for abdominal trauma at the Department of Surgery, University of São Paulo School of Medicine, Brazil. Eighteen patients (0.35%) had injuries involving the extrahepatic bile ducts. Records, including

operative and pathology reports, were reviewed to study the site of injury, associated intra-abdominal injuries, incidence, trauma scores, type of repair, morbidity and mortality rates.

RESULTS

Eighteen patients with extrahepatic bile ducts injuries were identified in a group of 5,069 patients (0.35%) who sustained intra-abdominal trauma over a six-year period. The patients age ranged from 15 to 30 years with a mean age of 22.5 years; 17 of the 18 patients were male.

Of the 18 extrahepatic bile ducts injuries, 15 (83.3%) were caused by penetrating wounds, and three by blunt trauma. All patients underwent exploratory laparotomy. In the 18 patients, 63 intra-abdominal injuries were found, or 3.5 per patient. Thirteen of the 18 patients (72.2%) had lacerations of the liver. Pancreas lacerations (11 patients), gastric lacerations (6 patients) and duodenal lacerations (6 patients) were the next most commonly seen injuries (Table.1). The distribution of injuries to the extrahepatic bile ducts was as follows: the left hepatic duct in one patient, the common hepatic duct junction in one patient, the common hepatic duct in three patients, the cystic duct in one patient and distal common bile duct or ampulla of Vater in 12 patients (Fig.1). Five of the 18 patients died (27.7%), none as a result of their bile duct injury. Two of these patients had simple lateral repairs, one of whom underwent decompression with a T tube. Five patients with simple repairs survived, and none had

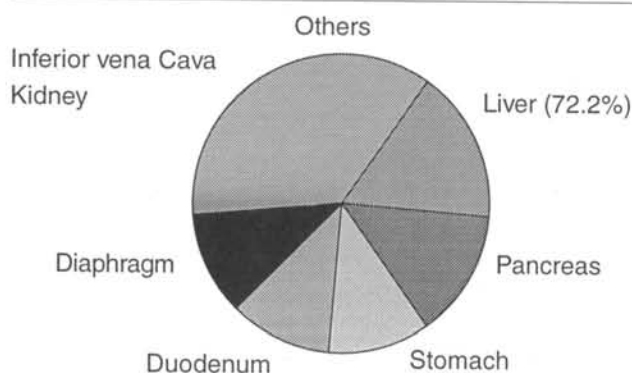
Address for correspondence:

Luiz Fernando Correa Zantut
Av. Brig. Luis Antonio, 4521 - Jd. Paulista
São Paulo/SP - Brasil - CEP 01401-002

problems related to the repair of the bile tract at the time of discharge. Two of ten patients with complex repairs died in the hospital. Six patients with an intrapancreatic common bile duct injury underwent a duodenopancreatectomy. Two patients with a complete transection of the common hepatic duct and common hepatic duct junction underwent Roux-en-Y hepaticojejunostomy. One patient with distal common bile duct lesion underwent Roux-en-Y choledochojejunostomy. One patient with distal common bile duct injury underwent choledochoduodenostomy (Table 2).

Table 1
Associated Intra-Abdominal lesion in patients with extrahepatic biliary ducts injuries

Associated Lesions = 3.4 Lesions / Patient



DISCUSSION

Trauma to the extrahepatic bile ducts is a rare but insidious diagnostic problem which is potentially fatal. Increasing civilian violence and a greater frequency of motor vehicle accidents are resulting in a higher incidence of trauma to the extrahepatic biliary system. Injury to the ducts themselves is rarely fatal, however associated injuries result in significant mortality. Furthermore, bile tract injuries themselves can be associated with considerable morbidity such as bile stenosis and leakage. Extrahepatic bile tree injury due to blunt abdominal trauma is rarer than penetrating injury. In the present series, the incidence was 0.12% and 0.57%, respectively.

The clinical picture is variable. Initially, there could be shock with severe or moderate low blood pressure, accompanied by considerable upper abdominal pain and rigidity, usually most severe in the right upper quadrant. Usually the period of shock and pain is a matter of few hours or less, and is followed by relatively symptom-free interval, unless there are associated injuries. With leakage of bile into the peritoneal cavity, jaundice, bileascites and

acholic stools occur. The jaundice is due to the absorption of bile pigment by the peritoneum.

Extrahepatic bile duct injuries are usually detected at the time of laparotomy and are seldom diagnosed preoperatively. Even during celiotomy, these lesions may

Table 2
Surgical Procedures

Treatment	
Suture	3
Pancreaticoduodenectomy	3
Suture + Choledochostomy	2
Choledochostomy	2
Hepaticojejunostomy Roux-en-Y	2
Choledochojejunostomy Roux-en-Y	1
Cholecystectomy	1

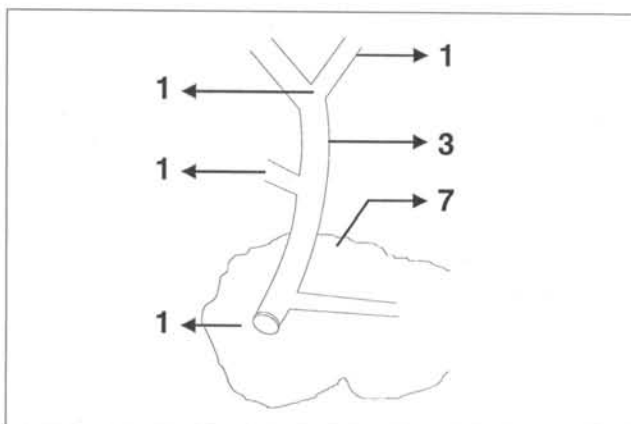


Figure 1 - Distribution of lesions in extrahepatic biliary ducts

be missed unless the bile tract is carefully inspected, a process which is more likely to be omitted in the presence of life-threatening wounds. Intra-operative cholangiography is extremely helpful in making the diagnosis of bile duct injury and in accurately localizing the injury.

Management of patients with traumatic extrahepatic lesions of the bile tract depends upon the site, type of injury and general conditions of the patient. In the profoundly hypotensive patient with a partial tear, external drainage will prevent bileascites and may occasionally be curative, although the formation of a stricture often occurs. On occasion, a small perforation or tear may be present in the retro-pancreatic portion of the common bile duct. In the unstable patient or the stable patient in whom visualization is difficult, another alternative is the insertion of a proximal tube to decrease the output from the expected fistula. If the patient is stable and has a partial tear, cystic duct

avulsion, or small through injury, a primary repair with an absorbable suture can be performed.

If the transection is clean and simple without significant contusion of both ends of the duct, an end-to-end anastomosis may be utilized. Dissection around the duct will cause additional devascularization of the ends, and should be avoided. When tension is present at the anastomosis, a stricture will result. When a complex transection has occurred, or a portion of the common bile duct has been destroyed or devascularized in a stable patient, a bilioenteric anastomosis using a Roux-en-Y limb should be performed.

On occasion, the combination of a hepatic ductal injury and a parenchymal injury will lead to a hepatic lobectomy. Duodenopancreatectomy is best reserved for rare distal bile duct injuries combined with injuries to the pancreatoduodenal complex or ampulla of Vater, as occurred in three of our patients.

We concluded that the type of repair employed in our series was related to the hemodynamic stability and clinical conditions (based on trauma scores) of the patient more than to the site and complexity of the injury.

RESUMO

As lesões das vias biliares extra-hepáticas são condições raras, graves e que possuem variadas formas de apresentação. Foram estudados 5.069 pacientes com traumatismo abdominal, atendidos no Pronto Socorro do Hospital das Clínicas da Faculdade de Medicina da Universidade de São Paulo, no período de 1986 a 1991, e identificados 14 deles com lesão em via biliar extra-hepática. Foram analisados os índices de trauma (RTS, ISS e TRISSCAN), sexo, idade, incidência, presença de lesões associadas, tratamento cirúrgico realizado, evolução pós-operatória, morbidade e mortalidade. Dos 14 pacientes, somente três (21.4%) tiveram esse tipo de lesão decorrente de trauma abdominal fechado, sendo os demais devido à trauma penetrante. A idade média dos pacientes com lesão da árvore biliar foi de 23.2 anos. A incidência foi de 0.28 % do total de pacientes e a mortalidade de 21.4%. O fígado e o pâncreas foram os órgãos mais acometidos, seguidos do estômago e duodeno. O tipo de lesão associada foi fator que contribuiu na mortalidade desses pacientes. O sítio mais freqüente de lesão foi o colédoco na sua porção intrapancreática (50 % dos casos). Os autores concluíram que o tipo de cirurgia empregado (conservador ou radical) esteve mais relacionado às condições gerais do paciente (daí a importância dos índices de trauma) do que à complexidade das lesões.

REFERENCES

- Bade PG, Thomson SR, Hirshberg A, Robbs JV. Surgical options in traumatic injury to the extrahepatic biliary tract. *Br J Surg* 1989;76:256.
- Diethrich EB, Beall AC, Jordan GL, De Bakey ME. *Am J Surg* 1966;112:756.
- Feliciano DV, Bitondo CG, Burch JM, Mattox KL, Beall Jr AC, Jordan GL. Management of traumatic injuries to the extrahepatic biliary ducts. *Am J Surg* 1985;150:705.
- Manlove CH, Quattlebaum FW, Ambrus L. Non-penetrating trauma to the biliary tract. *Am J Surg* 1959;97:113.
- Shorthouse AJ, Singh MP, Treasure T, Franklin RH. Isolated complete transection of the common bile duct by blunt abdominal trauma. *Br J Surg* 1978;65:543.
- Kitahama A, Elliot LF, Overby JL, Webb WR. The extrahepatic biliary tract injury. *Ann Surg* 1982;196:536.
- Longmire WP. Early management of injury of the extrahepatic biliary tract. *J Am Med Assoc* 1966;195:111.
- Ivatury RR, Rohman M, Nallathambi M, Rao PM, Gunduz Y, Stahl WM. The morbidity of injuries of the extrahepatic biliary system. *J Trauma* 1985;25:967.
- Brickley HD, Kaplan A, Freeark RJ, Broccolo E. Immediate and delayed rupture of the extrahepatic biliary tract following blunt abdominal trauma. *Am J Surg* 1960;100:107.
- Mason LB, Sidbury JB, Guiang S. Rupture of the extrahepatic bile ducts from nonpenetrating trauma. *Ann Surg* 1954;140:234.
- Hartmann SW, Greaney EM. Traumatic injuries to the biliary system in children. *Am J Surg* 1964;108:150.
- Posner MC, Moore EE. Extrahepatic biliary tract injury: operative management plan. *J Trauma* 1985;25:833
- Moyle WD, Karl RC. Rupture of the extrahepatic biliary ducts by external blunt trauma. *J Trauma* 1969;9:623.
- McFadden PM, Tanner G, Kitahama. Traumatic hepatic injury. *Am J Surg* 1980;139:268.
- Estrada RL & Sutherland NG. Subparietal or non-penetrating traumatic rupture of the biliary tree. *Br J Surg* 1969;56:7.
- Zeman RK, Lee CH, Stahl R, et al. Strategy of the use of biliary scintigraphy in non-iatrogenic biliary trauma. *Radiology* 1984;151:771.
- Rydell WB. Complete transection of the common bile duct due to blunt abdominal trauma. *Arch Surg* 1970;100:724.
- Michelassi F, Ranson JHC. Bile duct disruption by blunt trauma. *J Trauma* 1985;25:454.
- Fletcher WS. Non-penetrating trauma of the gallbladder and extrahepatic bile ducts. *Surg Clin North Am* 1972;52:711.
- Pailler JL, Auberget JL, Aleya M, Louis P, Mary G. Rupture des voies biliaires au cours des traumatismes fermés de l'abdomen. *J Chir* 1984;121:513.