Case Report

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Is Bowel Rest a Prerequisite for Successful Outcome in Nonoperative Management of Extrahepatic Bile Duct Blunt Injury in Children?

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Extrahepatic bile duct injury resulting from blunt abdominal trauma in children is not common. Nonoperative management has become the standard of care. During a two-year period from January 2005 to December 2006, we treated 1015 pediatric traumas. Of those, 103 were blunt abdominal trauma. Only two patients had injury to the extrahepatic bile ducts. Both cases were managed nonoperatively; however, the clinical presentation required a different approach. Facilitation of bile flow by means of sphincterotomy, or putting a transampullary stent, had the most significant impact on successful outcome. Bowel rest did not influence outcome. Therefore nonoperative management of blunt extrahepatic bile duct blunt injuries in children should be based on ensuring adequate bile flow. Bowel rest does not seem to be a prerequisite for successful outcome.

***Index Word**: : Blunt abdominal trauma; extrahepatic bile duct injury; nonoperative.*

INTRODUCTION

Injury to extrahepatic bile ducts resulting from blunt abdominal trauma in pediatrics is rare. Until recently, surgical intervention was the standard of treatment. Nonoperative management has proved to be successful, and is now considered to be the first line [1,2]. Although it is still unstandardized this management consists of bowel rest, percutaneous drainage of bile collections, and Endoscopic Retrograde Cholangiopancreatography (ERCP) with sphincterotomy or common bile duct stenting. The role of each of these parts has not yet been fully studied. During a two-year period from January 2005 to December 2006, we treated two pediatric patients with extrahepatic bile duct blunt injury. Both were managed nonoperatively. We present an individualized approach to management in terms of bile drainage and oral feeding and review the literature

CASE REPORT

Case 1:

A 3-year-old boy involved in motor-vehicle crash; had multiple grade two liver lacerations as a result of blunt abdominal trauma. The patient was transferred to our hospital ten days after the injury with significant abdominal distention. He was jaundiced and had a low-grade fever, but was otherwise stable. The serum bilirubin was 48 UMOL/L. Abdominal ultrasound showed significant ascites. Paracentesis showed bile-stained fluids. A hepatobiliary iminodiacetic acid (HIDA) scan documented a biliary leak, although the site of the leak could not be precisely located. The patient was kept on bowel rest (NPO) and total parenteral nutrition (TPN). Antibiotics were started. Under ultrasound guidance, percutaneous drainage of the subhepatic space and

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pelvis was performed. Drainage was about 400 cc of bile daily with no tendency to decrease in the following two weeks. Injury to the extrahepatic bile ducts was suspected. ERCP showed a leak from left hepatic duct (Figure 1). Sphincterotomy was performed during the same procedure. Drainage decreased significantly, and then stopped completely eight days after sphincterotomy. Repeated HIDA scan showed no leakage. The patient was started on oral feeding, and discharged home in a good status. Follow up for two years was unremarkable.

Case 2:

A 9-year-old girl involved in a motor-vehicle accident had head injury, blunt abdominal trauma with multiple liver lacerations, splenic hematoma, and fracture of the left femur, right pleural effusion, renal failure, candidemia, and urinary tract infection. She was transferred to our hospital 17 days after the injury. She was intubated and on nasogastric tube feeding. At our hospital seizures were controlled, and the patient was extubated, the chest tube was removed, renal function improved, the infection was controlled, and the patient continued on oral feeding. However the patient continued to have episodes of fever. Abdominal ultrasound showed collections in the subhepatic and subdiaphragmatic spaces. About 750 cc of bile-stained fluids were percutaneously drained. HIDA scan showed a bile leak, although the site of the leak could not be precisely located. ERCP showed a leakage from the left hepatic duct (Figure 2). Sphincterotomy and stenting of the common bile duct were performed during the same procedure.

The patient continued on oral feeding. Drainage stopped on the sixth day after the procedure. Repeated HIDA scan showed no biliary leakage. The patient was discharged home in a good status. The stent was removed one month later. Follow up for two years was unremarkable.

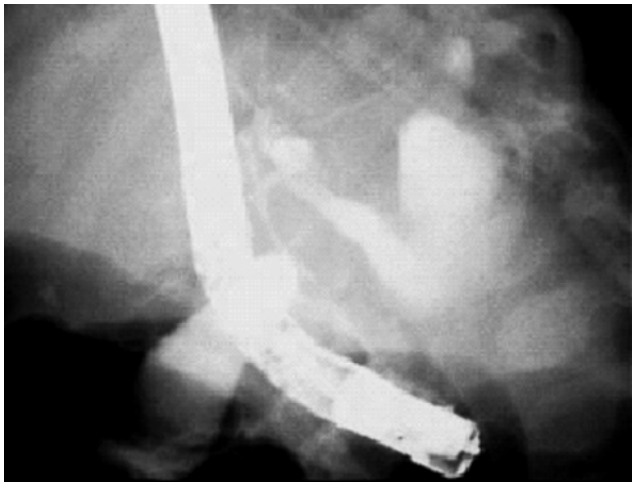

Fig. 1: ERCP for case 1 showing a leak from the left extrahepatic bile duct.

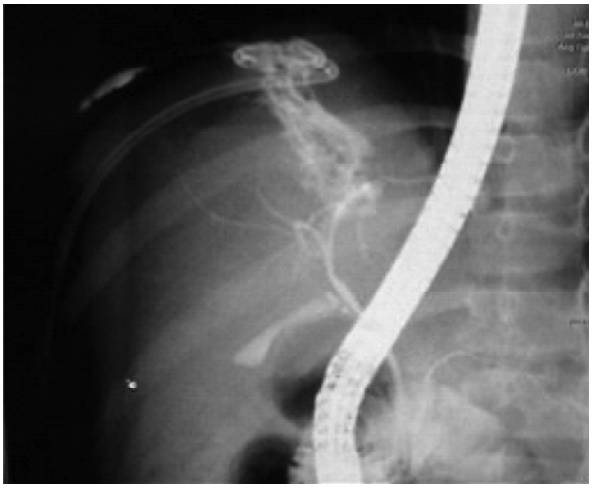

Fig. 2: ERCP for case 2 showing a leak from the left extrahepatic bile duct.

DISCUSSION

Persistent drainage in the first case and the large amount of drainage in the second case raised the possibility of injury to extrahepatic bile ducts. In both cases, a high level of suspicion was the main factor in establishing diagnosis. ERCP was the main diagnostic tool. The first patient was kept NPO until complete cessation of the drainage; however, a significant decrease of the drainage was noticed only after sphincterotomy. The second patient was already on oral feeding at the time of diagnosis, so it was decided to be continued. In both cases, drainage stopped completely within a few days after sphincterotomy. Bowel rest was not of significant value in the first case, and was not required in the second case.

Extrahepatic bile duct injury resulting from blunt abdominal trauma is rare in pediatrics. An updated review of literature by Sharpe et al [3] found 47 pediatric patients who sustained blunt injury to

extrahepatic bile ducts. He added his own case for a total number of 48 cases up to 1999. Injuries to gallbladder and cystic duct were excluded from that review.

Until 1990th surgical treatment by means of debridement and closure with or without T-tube; patch closure using gallbladder, cystic duct, vein serosa; biliary-enteric anastomosis; or ligation and drainage with plans for subsequent enteric diversion, was the standard of treatment [3-9]. Eid et al [10] were the first to describe a nonoperative approach consisting of percutaneous drainage of subhepatic space and ERCP for stent placement in an adult patient with a left hepatic duct tear. This was subsequently used in two pediatric patients with tears of the left hepatic duct and common hepatic duct. Subsequently reports started to appear in literature showing a high success rate [3,7,10-12,18], and nowadays, nonoperative treatment is considered to be the first line in the management of these patients even in the presence of high grade injury [1,2]. A combination of endoscopic treatment and minimal invasive surgery has been reported as well [13,14].

Nonoperative management by itself is multi-component. It consists of bowel rest, percutaneous drainage of bilomas, and ERCP with sphincterotomy with or without ductal stenting, or even stenting without sphincterotomy [3,7,10-12,15,19]. Recent studies have proven the theoretical advantage of biliary stenting across the ampula with subsequent facilitation of bile flow and decreasing intraductal pressure [15-16]. Bowel rest is believed to be an important component of this strategy, theoretically decreasing bile flow and enhancing healing [3,10,13,17]. Octreotide has been used as well in the management of pancreatobiliary leaks [20].

Our results were similar to those in the literature; although, we did not find bowel rest to be of significant value in the clinical course and outcome of both patients. These results suggest that early feeding does not adversely affect the healing of injured bile ducts. In contrast we believe that it gives an opportunity to improve the nutritional status of the injured body, and obviates the potential complications associated with total parenteral nutrition. Prospective trials with larger number of patients are still needed.

CONCLUSION

Extrahepatic bile duct injury resulting from blunt abdominal trauma in pediatrics is rare. Nonoperative management is feasible and safe. ERCP with tube placement through the sphincter with, or preferably, without sphincterotomy is the cornerstone of this strategy. Bowel rest does not seem to be a prerequisite for successful outcome. Early feeding obviates the need for total parenteral nutrition, and eliminates its costs and potential complications .

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