Endoscopic Treatment of Postoperative External Biliary Fistula in a Patient Operated on for Hepatic Injury Due to Multiple Trauma

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(Received 26 January 1996; In final form 20 March 1996)

After surgery for hepatic injury as a result of blunt abdominal trauma from a motorcycle accident, an external biliary fistula developed in a young patient. The authors describe the rapid and complete healing of the fistula by use of a nasobiliary catheter. These findings emphasize the importance of endoscopic operative technique for postoperative and traumatic external biliary fistulas.

Keywords: External biliary fistula, endoscopic retrograde cholangiopancreatography, nasobiliary catheter

INTRODUCTION

External biliary fistula is a possible complication of hepatic trauma or hepatic surgery. It can also be a result of elective biliary surgery for lithiasis, neoplasm, or echinococcosis [1,2]. Its incidence is estimated to be 0.1 to 0.3% of all biliary operations [3]. Biliocutaneous fistulas due to spontaneous drainage of biliary or hepatic abscesses are extremely rare [4]. Untreated blunt hepatic trauma can cause external fistulas in about 4% of all patients [5].

Causes of postoperative biliocutaneous fistulas include residual lithiasis, distal stenosis, premature

removal of Kehr tubes, and iatrogenic injury or accidental ligation of the common biliary duct [6]. Fistulous drainage may cause significant fluid and electrolyte losses, requiring prolonged hospitalization.

Surgical therapy of external biliary fistulas is often associated with high morbidity (50%) [7] and mortality due to procedures performed in inflamed and septic tissues.

Endoscopic operative procedures represent a valid and often successful treatment for these kinds of complications in biliary surgery: endoscopic retrograde cholangiopancreatography (ERCP) permits extremely precise diagnosis and allows biliary drainage through

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a nasobiliary tube or endoprosthesis. Successful endoscopic therapy has been reported after endoscopic sphincterotomy [8,9] or drainage by use of nasobiliary catheters [10] or after positioning plastic or metal stents [11–13].

The authors report a case of external biliary fistula subsequent to an operation for hepatic injury in a patient with blunt abdominal trauma. Endoscopic positioning of a nasobiliary drainage tube permitted complete healing of the fistula within a few days.

CASE REPORT

A 17-year-old male patient was involved in a motorcycle accident and was admitted to the emergency department exhibiting a right humerus fracture and abdominal blunt trauma. His arterial blood pressure could not be obtained; an abdominal ultrasound scan demonstrated a massive hemoperitoneum. As a result, laparotomy was immediately performed. The discovery of multiple dilacerations of the VIth, VIIth, and VIIIth liver segments suggested the extension of the laparotomy to a thoracolaparotomy. Intraperitoneal blood losses were evaluated as 4.5 liters; however, 2.2 liters were reinfused by an automatic blood intraoperative transfusion machine. Multiple hemostatic sutures were placed to avoid extensive hepatectomy. The patient was subsequently admitted to the critical care unit. On the 3rd postoperative day, biliary leakage from the abdominal drainage tube became evident. The leakage averaged approximately 800 ml in a 24-hr period. On the 16th postoperative day, surgical osteosynthesis of the humerus was performed. At the same time, an ERCP was performed, which demonstrated contrast leakage on the VIIIth segment intrahepatic biliary duct. Biliary tracts appeared extremely narrow due both to the young age of the patient and the fact that they were empty. Cholelithiasis was not found (Fig. 1). A papillosphincterotomy was performed, and a nasobiliary tube was placed directly in the injured biliary duct. One day later, only 40 ml of biliary leakage was registered, and 600 ml had been drained from the nasobiliary tube. Afterward no more bile leaked from the abdominal drainage tubes. A

trans-nasobiliary tube cholangiography, performed 5 days later, demonstrated the persistence of leakage of contrast material (Fig. 2). Another cholangiography, performed 12 days after ERCP, demonstrated complete healing of the fistula (Fig. 3).

After 40 days of hospital stay, the patient was completely recovered and was discharged.

DISCUSSION

The possibility of spontaneous resolution of biliocutaneous fistulas directly depends on the drainage capability of the main biliary tract. Fistulas will be sustained until the obstacle is removed. Persistence of biliary leakage around biliary ducts generally causes definitive stenosis. Prompt choledochal drainage prevents biliary leakage complications, which may occur early on or at a later stage [14]. Decompression of the biliary tract causes a significant reduction of fistula output (up to 90 to 95%) [5], facilitating internal drainage and fistula closure in a shorter time. It is reported that untreated bile leakage spontaneously resolves in an average of 33 days (ranging from 3 to 110 days), with a high incidence of complications such as infections, sepsis, and respiratory failure [15]. Healing of nasobiliary drained fistulas is reported to occur between 2 and 3 weeks without any complications [2,5]. First, the procedure requires a correct diagnosis using ERCP to identify the precise location of the fistula. The next step involves the wedging of the nasobiliary catheter as distally as possible in the biliary tract, which is directly responsible for nourishing the fistula. The nasobiliary catheter must be maintained in continuous aspiration. Additionally, in our patient, we preferred to perform a papillosphincterotomy to decrease the pressure in the biliary tree and also to allow the bile to drain from the left side of the biliary tree, which had not been drained by the catheter.

In 1979, Agrawal *et al.* [16] described the first endoscopic diagnosis of biliary fistulas. In 1983, O'Raihillly *et al.* [17] successfully cured a fistula by endoscopic sphincterotomy. The first endoscopic treatment of post-traumatic biliocutaneous fistula was

FIGURE 1 ERCP: contrast material leakage in the biliary branch of the VIIIth segment.

performed by Burmeister *et al.* [18] in 1985, with a nasobiliary drainage tube. The first use of endoprotheses in external biliary fistulas was described in 1986 by Huibregtse *et al.* [19] and by Smith *et al.* [11] and, subsequently by Devier *et al.* [20] in 1987.

ERCP permits a complete study of the biliary tree, except for fistulas caused by complete ligature of choledochus: however, patients with these fistulas

are candidates for surgery. In all other patients bilio-cutaneous fistulas, an 86% success rate is reported [3,6].

Some authors [3] suggest inserting an endoprosthesis instead of the nasobiliary tube because of physiologic duodenal bile drainage. Other authors [14] report a 100% success rate with use of sphincterotomy associated with a nasobiliary tube.

FIGURE 2 First trans-nasobiliary tube cholangiography (5th post-ERCP day): the biliary fistula of the VIIIth segment is still evident.

CONCLUSIONS

Operative endoscopy and nasobiliary drainage provide excellent results and is supported by a breadth of international literature, which suggests that endoscopic operative techniques must be the treatment of choice for postoperative and traumatic external biliary fistulas. Moreover, endoprotheses can be used when nasobiliary tube aspiration is not functioning, espe-

cially in fistulas caused by neoplastic involvement of the biliary tract.

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FIGURE 3 Second trans-nasobiliary tube cholangiography (12th post-ERCP day): the contrast material leakage is not evident anymore.

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