T-tube access for endoscopic sphincterotomy: a variant of combined percutaneous and endoscopic approach

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Selective deep cannulation of the common bile duct (CBD), which is essential for successful endoscopic sphincterotomy, may not be possible in all patients. Three patients with retained CBD stones with T-tube in situ in whom selective deep cannulation failed, underwent successful sphincterotomy using a combined percutaneous and endoscopic procedure through the T-tube. CBD stones were then extracted with a Dormia basket. In situ T-tube can provide percutaneous access for combined approach in patients with retained CBD stones in whom endoscopic cannulation is not successful. [Indian J Gastroenterol 1999;18:29-30]

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Endoscopic sphincterotomy (ES) is an established method for the treatment of the common bile duct (CBD) stones. Selective and deep cannulation of the CBD during endoscopic retrograde cholangiography (ERC) is a prerequisite for ES. However, despite the use of additional devices designed to facilitate CBD cannulation in difficult cases, the success rate of selective CBD cannulation does not exceed 90%-95% even in tertiary centers.

We describe three patients with retained CBD stones following cholecystectomy in whom in situ T-tubes were used to provide percutaneous access for performing ES after all attempts at standard endoscopic cannulation had failed.

Case Reports

Case 1: A 55-year-old woman presented with recurrent biliary colic for 1 year. There was no history of jaundice, fever, weight loss or anorexia. Clinical examination revealed smooth hepatomegaly. Liver function tests were normal. Ultrasonography showed multiple gallstones and thickened gall bladder wall. She underwent cholecystectomy, CBD exploration and T-tube placement. Postoperatively, T-tube cholangiogram revealed a single CBD stone. At ERC, cannulation of the CBD failed. Subsequently, under fluoroscopic guidance, a 0.035 inch Terumo guidewire (Shibuya-ku, Tokyo) was passed through the T-tube and negotiated across the papilla into the duodenum. The guidewire was then brought out of the biopsy channel of a side-viewing endoscope (TJF-10; Olympus, Japan) using a Dormia basket. Deep cannulation of the CBD was performed by advancing a 5F standard catheter (Microvasive; Watertown, MA) over the Teruma guidewire. The Terumo guidewire was then exchanged with a 430 cm 0.035 inches Zebra exchange guidewire (Microvasive). A cannulotome was advanced over the Zebra guidewire into the CBD and a 1.0 cm sphincterotomy was performed. The retained CBD stone was then extracted with a Dormia basket (Fig). The T-tube was removed the next day after check cholangiography through the T-tube showed a clear CBD.

Case 2: A 49-year-old woman was referred with high-grade fever, upper abdominal pain and jaundice for 20 days after laparoscopic cholecystectomy done at another hospital. On examination she was found to be icteric and febrile (40°C), with mild hepatomegaly. Investigations revealed serum bilirubin 4.2 mg/dL, AST 62 IU/L, ALT 42 IU/L and alkaline phosphatase 16 KAU. Ultrasonography showed a dilated CBD (12 mm) with a stone at the lower end, and fluid in the peritoneal cavity. At ERC, deep cannulation of the CBD failed due to the impacted stone. Cholangitis did not improve after IV piperacillin. Laparotomy was performed and 2.5 liters of bilious fluid

Fig: Cholangiogram through T-tube showing impacted stone at lower end of CBD (left). Terumo guidewire is caught with Dormia basket (center) and brought out of biopsy channel. Cholangiogram after successful extraction of stone following sphincterotomy (right)
was drained from the peritoneal cavity. The CBD was severely inflamed and friable and contained pus; therefore, removal of the stone was not attempted. A T-tube was placed in the CBD. T-tube cholangiogram revealed an impacted stone at the lower end of the CBD with no flow of contrast into the duodenum. Sphincterotomy and stone extraction with Dormia basket was carried out using the combined approach as described in Case 1.

Case 3: A 59-year-old woman was referred for a retained CBD stone detected after cholecystectomy. T-tube cholangiogram showed an impacted stone at the lower end of the CBD with no flow of contrast into the duodenum. Liver function tests revealed elevation of serum alkaline phosphatase by two times the normal. Deep cannulation of the CBD failed on ERC because of the impacted stone. Using a combined approach as described in Case 1, sphincterotomy with Dormia extraction of CBD stone was done successfully.

Discussion

Identifiable causes of failure of CBD cannulation include previous gastric surgery, peripancreatic diverticulum, impacted stone at the lower end of the CBD and papillary stenosis. Occasionally, it is simply not possible to cannulate the CBD selectively, despite the use of ball-tipped, cone-tipped, or tapered cannula, cannula over guidewire, and a variety of guidewires. Two of our patients had impacted stone at the lower end. These patients are candidates for alternative approaches, which include percutaneous, combined percutaneous-endoscopic, or further endoscopic attempts using precut papillotomy.

The choice between a precut procedure and the percutaneous approach largely depends on the personal preferences and expertise of the endoscopists. We preferred T-tube access over precut papillotomy as the former is safe and less traumatic while the latter is associated with morbidity (2.6%-20%) and mortality (0%-1%). The success of selective cannulation of the CBD even after a precut papillotomy varies from 53% to 88%. Combined approach has been used widely to place endoprostheses for palliation of malignant biliary obstruction. Combined endoscopic and radiologic technique was first described by Mason and Cotton for patients with choledocholithiasis who had failure of cannulation at ERC due to papillary stenosis. Ponchon et al performed sphincterotomy in 16 patients with CBD stones, guided by a 5F catheter which was inserted into the CBD on a metal guidewire via a percutaneous transhepatic route. Long et al reported successful endoscopic sphincterotomy by antegrade transhepatic catheterization in 5 patients. They inserted an open Dormia basket into the sphincter and pulled the sphincterotome into the CBD with the help of the basket. These approaches involve the creation of a percutaneous transhepatic route with its associated risk.

We succeeded in removing the retained CBD stones by combined approach using T-tube access in all the 3 cases without any complication. Use of an in situ T-tube for providing percutaneous access is a safe and simple procedure. We suggest that such an approach should be undertaken whenever selective and deep cannulation fails in a patient with a T-tube in situ.

References


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