CASE REPORTS

Retained bile duct stones in a patient with Billroth II gastrectomy: extracorporeal shock wave lithotripsy and papillary dilatation via T tube

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Abstract

A postoperative T tube cholangiogram after cholecystectomy in a 62 year old patient showed two retained calculi of 14 mm diameter each. Endoscopic sphincterotomy was not possible because of previous Billroth II gastrectomy. The stones were disintegrated by electromagnetically generated extracorporeal shock waves. The T tube was replaced by a balloon catheter and the papilla of Vater was dilated allowing passage of stone fragments. We conclude that retained bile duct stones can be removed without sphincterotomy or percutaneous extraction by extracorporeal shock wave lithotripsy and papillary dilatation. This method should be considered especially in patients with Billroth II gastrectomy.

Retained common bile duct stones after cholecystectomy continue to be a problem in 2 to

5% of the patients who have undergone surgery, despite the common use of operative cholangiography.¹ There are two possible ways to extract retained stones: (a) via the T tube channel using a Burhenne basket and (b) via endoscopic retrograde cholangiopancreatography and sphincterotomy. In patients with Billroth II gastrectomy, however, endoscopic sphincterotomy carries a higher risk and fails in at least 35%.²

We report the successful combination of extracorporeal shock wave lithotripsy (ESWL) and papillary dilatation via the T tube channel in a patient with retained bile duct stones and Billroth II gastrectomy.

Case report

A 62 year old man was wounded 45 years ago by a shot through the stomach for which he underwent surgery. Seven years later a Billroth II gastrectomy was performed for duodenal ulcers. Subsequently, biliary colic with jaundice led to cholecystectomy with common duct exploration in March 1989. A postoperative T tube cholangiogram (Fig 1) showed two retained calculi (14 mm each) in the common bile duct. Endoscopic sphincterotomy was impossible and attempts to dissolve the stones with EDTA and mono-octanoin failed. The patient was therefore referred to our hospital four weeks after cholecystectomy.

The density of the stones, measured by computed tomography, was 47 HU suggesting that they consisted of cholesterol.³ It was decided to disintegrate them by ESWL using the Lithostar lithotripter (Siemens, Erlangen, West Germany). The bile ducts were opacified via a T tube and the stones were located by fluoroscopy. Three ESWL sessions were undertaken and 2500 shock waves were applied to each stone at an energy level of 18.1 kv. Because the second treatment session had to be interrupted due to pain despite intravenous opiate analgesia, the third treatment was performed with ketamin anaesthesia. Altogether 5000 shock waves were applied.

The stones disintegrated and most of the fragments disappeared spontaneously while rinsing the bile duct with standard electrolyte solution via the T tube. Some small fragments remained, however (Fig 2). Using a J tipped

Figure 1: Postoperative cholangiogram via T tube showing two retained bile duct calculi.

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Figure 2: Stone fragment after three sessions of extracorporeal shock wave lithotripsy treatment (altogether 5000 shock waves) using a Lithostar lithotripter (Siemens, Erlangen, FRG).

guide wire, the T tube was replaced by a balloon catheter (Vygon, Aachen, FRG), which was passed through the papilla of Vater into the duodenum (Fig 3). The position of the balloon in the papillary segment was confirmed by fluoroscopic control. The catheter consists of a double lumen tube with a total length of 195 cm and outer diameter of 1.5 mm. The banana shaped balloon has a length of 4 cm and a diameter of 1.5 cm after full insufflation with air or water. The free end of the catheter distal to the balloon amounts to 4 cm. The sphincter was dilated by inflating the balloon to its full diameter by 10 ml air for 20–30 seconds. This was repeated four times. After this procedure the contrast medium quickly passed through the papillary segment and the small fragments disappeared into the duodenum by rinsing the bile duct with 0.9% saline. The final x ray examination confirmed that the bile duct was free of stones and the catheter was removed (Fig 4).

Discussion

After cholecystectomy, the usual treatment of bile duct stones is endoscopic sphincterotomy. In patients with Billroth II gastrectomy, however, endoscopic treatment fails in at least 35%.² Shortly after cholecystectomy, the T tube offers another possible method of treating retained stones. Burhenne reported on the percutaneous extraction of retained biliary tract stones through the T tube sinus tract in 661 patients.⁴ For this procedure, a time interval of five to seven weeks after cholecystectomy is necessary for the formation of the sinus tract wall. Moreover, only stones up to 6–8 mm in diameter can be

Figure 3: Balloon dilatation of the papilla of Vater; the tip of the catheter is positioned deeply in the duodenum. The inflated balloon is located between both radiopaque points.

Figure 4: Cholangiogram after extracorporeal shock wave lithotripsy and balloon dilatation: the bile duct is free of stones or fragments.

extracted. Larger stones require fragmentation, which can be achieved either mechanically with a basket⁵ or by local application of shock waves.⁶

Meanwhile, reports using ESWL on bile duct stones with electrohydraulically,⁷ electromagnetically,⁸ and piezoelectrically⁹ generated shock waves have been published. Johlin treated large retained stones with ESWL and extracted the remaining fragments either through the T tube channel or via endoscopic sphincterotomy.¹⁰ One of the major problems after ESWL is the removal of the fragments, especially in patients with Billroth II gastrectomy. The combination of ESWL and percutaneous extraction of the fragments was also reported by Becker.¹¹ Darzi¹² dissolved the fragments after ESWL with methyltertbutylether.

Papillary dilatation^{13–15} carries a lower risk than sphincterotomy and percutaneous extraction. In this patient all fragments of the retained bile duct stones passed through the papilla of Vater after ESWL and papillary dilatation, supported by rinsing the bile duct with electrolyte solution. Anaesthesia with Ketamin for ESWL treatment is unusual. In none of the 24 other patients with bile duct stones treated in our unit was Ketamin application necessary for ESWL (about 30 sessions). Compared with alternative treatments, ESWL in combination with papillary dilatation carries a minimal risk only. This method should be considered, especially in patients with Billroth II gastrectomy.

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