DOUBLE-BALLOON ENTEROSCOPY THROUGH A ROUX-EN-Y LIMB FOR REMOVAL OF MIGRATED METALLIC STENT : REPORT OF A CASE

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The self-expandable metallic stent is increasingly being used for management of malignant biliary strictures and sometimes for benign strictures. Although the migration rate of metallic stents is very rare, removal of migrated metallic stents is a technical challenge if patient has received a biliary Roux-en-Y operation.

A patient who had received Roux-en-Y operation due to common bile duct transection received self-expandable metallic stents insertion for benign stricture of hilum. Unfortunately the self-expandable metallic stents migrated soon after insertion. We had tried push type enteroscopy for metallic stents removal but that failed. Finally we successfully removed the migrated metallic stents with double balloon intestinal endoscope.

Migration of self-expandable metallic stents in the Roux-en-Y intestinal loop is a very rare condition and is difficult to resolve. We removed the migrated metallic stent with double balloon enteroscopy and found a new indication of double balloon enteroscopy.

Key words: **Double balloon enteroscope , Roux-en-Y anastomosis, migrated metallic stent**

Benign bile duct strictures remain one of the most difficult problems encountered by the hepatobiliary surgeon. The vast majority of bile duct strictures occur as a complication of cholecystectomy. The essential first step of management consists of delineation of the proximal biliary anatomy. Current management techniques include either operative biliary reconstruction or nonoperative balloon dilatation by either the percutaneous transhepatic or endoscopic routes. The best form of surgical reconstruction of the biliary tree is a biliary-enteric anastomosis from the proximal bile duct to a Roux-en-Y limb of jejunum. Roux-en-Y choledochojejunostomy (RYCJ) is frequently used for biliary bypass surgery especial for the biliary benign stricture. The commonest complication of choledochojejunostomy for the management of biliary strictures is recurrent cholangitis and later developed ischemic stricture of the Roux-en-Y intestinal loop [1]. Under these

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conditions, insertion of self-expandable metallic stents is suitable for relief of biliary stenosis. Although the migration rate of metallic stents is rare, complications still occasionally occur. We here present a case with migrated metallic stents successfully removed by double balloon enteroscope through the Roux-en-Y limb. This is the first reported case for removal of metallic stents with double balloon enteroscope through Roux-en-Y limb.

CASE REPORT

A 67 year-old male patient with past history of perforated peptic ulcer post partial gastrectomy with Billroth's II anastomosis, and had suffered from gall stone related acute cholecystitis and accepted laparoscopic cholecystectomy in March 2004. The common bile duct was accidentally transected during cholecystectomy. So he was transferred to our hospital for choledochojejunostomy.

After choledochojejunostomy, the patient suffered from recurrent cholangitis and jaundice and needed repeated percutaneous transhepatic cholangiodrainage (PTCD) tube irrigation and revision. The following cholangiography showed obvious progressive hilar stricture and dilatation of bilateral intrahepatic ducts. The attacks of acute cholangitis increased during this period.

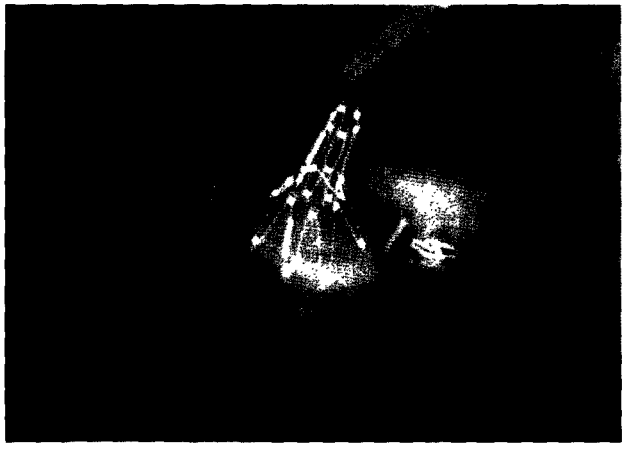

Figure 1. normal position of metallic stents under cholangiography

The patient agreed to accept insertion of metallic stents due to recurrent cholangitis. The surgeon performed insertion of Z metallic stents (Cook-Z stents GZS-12-6.0-CF USA) through the PTCD route in September 2005 (fig1). The patient suffered from severe abdominal pain and fever the day following the Z metallic stents insertion. Follow up cholangiograms showed that the inserted metallic stents had migrated distally to the tip of Roux-en-Y intestinal loop (fig2). We tried to remove the stent with endoscope.

First we performed endoscopy for removal of migrated metallic stents with conventional push type enteroscopy (Olympus SIF230 Japan) but failed. The cause of failure was the sharp angle between the Roux-en-Y limb and jejunum and the

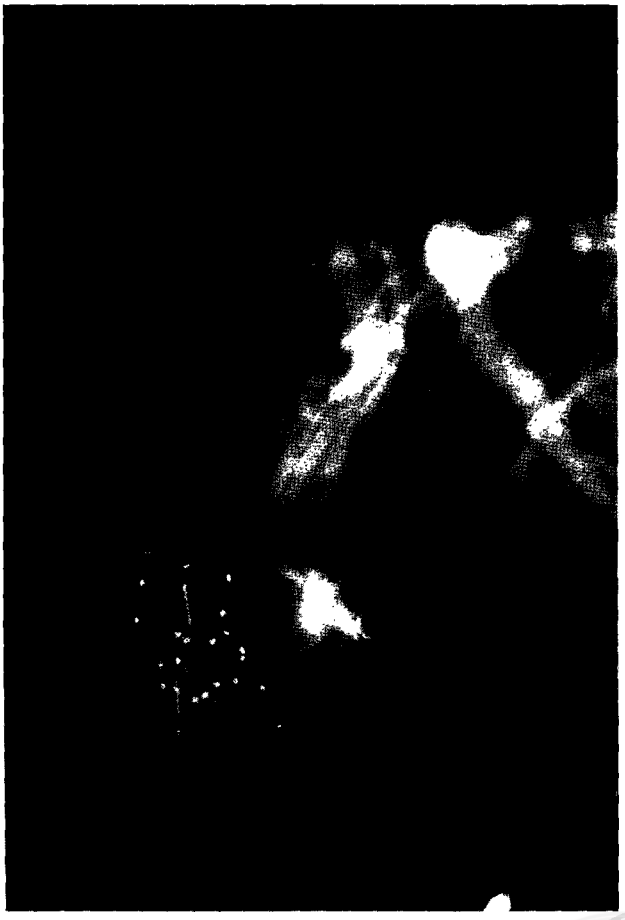

Figure 2. migrated metallic stents under cholangiography one day later after insertion

Figure 3. double balloon enteroscope approach the migrated metallic stents

conventional enteroscopy could not pass through the anastomosis of choledochojejunotomy due to approach of the migrated stent. After realizing the cause of conventional enteroscopy failure, we performed double balloon enteroscopy (Fujinon EN450T5 Japan) to remove metallic stent again. We pushed the double balloon enteroscope through the anastomosis of choledochojejunostomy and successfully approached the migrated metallic stent within the tip of Roux-en-Y limb (fig3). Finally we removed the migrated metallic stent successfully with the basket (MTW endoskopie 03113603 German). The whole procedure for removing the migrated stent (fig4) took about two hours.

We followed the patient's condition for one week. Mild tarry stool passage had been complicated. After using proton pump inhibitor , the patient felt better and then discharged.

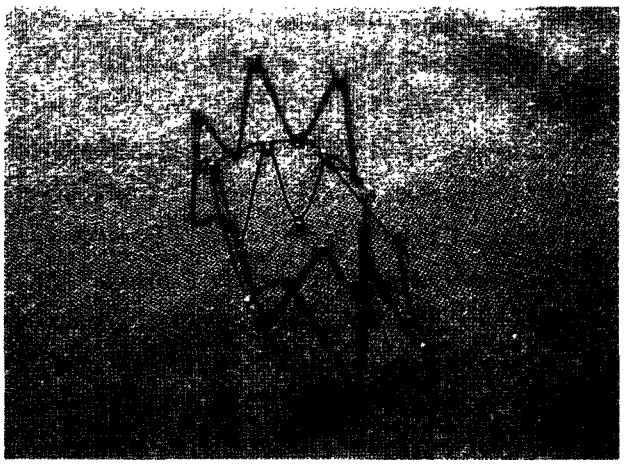

Figure 4. removed metallic stent

DISCUSSION

Of all the complications of laparoscopic cholectecystomy, bile duct injury is the most serious one. Heise M et al had mentioned that 73% of patients are common bile duct (CBD) injuries among the total cases and 15% of patients with a complete transection of the CBD require surgical reconstruction [2]. Conzo et al described fifty-one patients with bile duct injuries following laparoscopic cholecystectomy. The most frequent lesions were main bile duct partial or total transection. The T-tube positioning and Roux-en-Y hepato-jejunostomy were the procedures most frequently performed. The complication rate in patients treated with the T-tube was significantly higher than those treated with hepatico-jejunostomy. Roux-en-Y hepato-jejunostomy remains the procedure of choice for these injuries [3].

DiFronzo et al had mentioned that biliary-enteric anastomosis has been associated with significant complications of early bile leak, cholangitis, and late stricture formation. Complications occurred in 14.1 per cent of patients. The mean follow-up was 13.1 months in all patients [4]. Malhotra described the commonest complication of hepatico-jejunostomy for the management of biliary strictures is recurrent

cholangitis. The stricturous intestinal loop was excised with re-anastomosis with new Roux-en-Y loop [5].

Rohde L et al reported their experience with surgical treatment of 39 patients with biliary strictures of iatrogenic origin. Patients were grouped according to the level of obstruction as described by Bismuth, and the type of repair was based on this classification. Overall, 29 patients (83% of those 35) presented good results. Factors related to the prognosis that must be emphasized are surgeons' individual experience and skills, location of the stricture and diameter of the anastomosis [6]. So operation is the main method. Our patient accepted insertion of Z metallic stent because he refused surgery.

The self-expanding metallic stents (SEMS) can be implanted easily and revolutionized both benign and malignant biliary strictures[7]. The clinical trials have shown that occlusion remains the most common problem with SEMS. Other possible complications include migration and gastric outlet obstruction. Although the possibility of migration of SEMS has been predicted but the occurrence rate has not been reported. Wamsteker, MD et al had explained the mechanism. The coating on covered stents likely prevented embedding within the tumor, which may make the stents prone to migration [8].

Regarding the removal of migrated SEMS, Kahaleh had concluded that removal of uncovered Wallstents required a combination of techniques and the removal of covered Wallstents with snare is relatively simple and safe [9]. Matsushita had mentioned using an open-biopsy-forceps technique for endoscopic removal of these migrated stents in 4 patients. Although ulceration was evident in the duodenal wall but no other complication or adverse event was observed [10]. If the migrated SEMS is in the tip of Roux-en-Y intestinal limb, the above methods are not suitable. The only modality which can pass through the Roux-en-Y anastomosis is the double balloon enteroscope. Yamamoto used the double-balloon technique to access the afferent duodenal loop in a patient with Roux-en-Y gastrojejunostomy. He had performed endoscopic mucosa resection (EMR) of an early cancer in the terminal part of afferent loop with the double-balloon technique in this patient [11]. The Roux-en-Y anastomosis is a popular method of surgical reconstruction of GI tract. This operation has the disadvantage that it makes endoscopic examination of the afferent loop extremely difficult when using conventional push type endoscopes . We had tried to approach the migrated SEMS with conventional endoscope (Olympus SIF 230 Japan) but failed. So we used double-balloon enteroscopy for the removal of migrated metallic stents in the Roux-en-Y intestinal loop. The double-balloon enteroscope consists of an endoscope which can mount a balloon at its distal end and an over tube with balloon. The double-balloon enteroscope was inserted with an overtube and the scope could easily approach the migrated stents if the overtube could pass through the Roux-en-Y anastomosis and then we removed the stents with basket successfully. The double-balloon endoscopy features not only good insertability, but also good maneuverability even after it is inserted distally. For these reasons, I think the double-balloon enteroscopy is good for removal of migrated metallic stent in Roux-en-Y intestinal loop.

In summary , the CBD injury is an occasional complication during performance of laparoscopic cholecystectomy. Choledocojejunostomy is the documented method for the CBD injury but occasionally complicated with stenosis. Although SEMS can overcome the stenosis but removal of migrated SEMS is a difficult challenge. The double-balloon enteroscopy may be the only modality for removing the migrated SEMS in the tips of Roux-en-Y intestinal loop.

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應用雙氣囊小腸鏡取出膽管空腸吻合術空腸端移位的金屬支架—一病例報告

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67歲男性病人因膽結石接受腹腔鏡膽囊摘除術不幸傷到總膽管造成斷裂，之後急做膽管空腸吻合術以空腸來接合膽管。病人術後2個月後即反覆膽管炎發作，長期以來均需經皮穿肝膽管引流來緩解症狀，膽道影像顯示膽管空腸吻合處明顯狹窄，故置入金屬支架緩解，但金屬支架在置入隔天即移位並造成膽管阻塞，在使用傳統小腸鏡取出失敗後我們改用雙氣囊小腸鏡成功的取出空腸端移位的金屬支架，證明要用內視鏡進入膽管空腸吻合術空腸端，雙氣囊小腸鏡是唯一選擇，這也是使用雙氣囊小腸鏡成功取出空腸端移位金屬支架的第一個病例。

關鍵詞：雙氣囊小腸鏡，膽管空腸吻合術，移位的金屬支架