

## —Report on Experiments and Clinical Cases—

## Successful Removal of a Stone and an Expandable Metallic Stent from the Biliary Tract of a Patient with Acute Occlusive Pyogenic Cholangitis

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### Abstract

We removed a biliary stone and the metallic stent placed two years previously in a patient with benign biliary strictures.

An 80-year-old woman who had been implanted with an expandable metallic stent (EMS) to prevent obstruction by a large common bile duct stone about two years before as an emergency measure in another hospital, was afflicted with acute occlusive pyogenic cholangitis (AOPC) and hospitalized in our hospital. After treating the AOPC, we successfully removed the EMS with a cholangioscope and normal biopsy forceps through the percutaneous transhepatic channel under fluoroscopy.

The type of the EMS was Accufulex<sup>®</sup> stent. To remove it was easier than expected. Once it started to unravel, it was removed from the common bile duct within a few minutes. (J Nippon Med Sch 2000; 67: 380—383)

**Key words:** expandable metallic stents, removal of stents, cholangioscopy, percutaneous transhepatic biliary drainage, acute occlusive pyogenic cholangitis

### Introduction

Recently many authors have investigated the use of EMS in the biliary tree to treat benign or malignant strictures<sup>1-9</sup>. In the case of benign strictures, long-term stents patency is the most important factor to be considered<sup>5</sup>, because patients have long life expectancies and the stents tube, once positioned, cannot be removed, and surgical repair is generally not feasible<sup>5,6</sup>.

There are arguments both for and against the indication of EMS for benign strictures. The tide of opinion is still discreet<sup>10,11</sup>. Mostly it is considered only for poor risk cases<sup>7,8</sup>.

On the other hand, most benign biliary strictures are regarded as iatrogenic<sup>12</sup>. Endoscopic cholecystectomy, which is considered to be the major cause of biliary tract injury, is very popular nowadays<sup>12</sup>.

We report here the removal of biliary metallic stents placed in a patient with benign biliary strictures, including the technical problems encountered.

### Case Report

An 80-year-old Japanese woman, who developed abdominal pain, fever and jaundice, was hospitalized in our hospital. The patient had been given a self expanding metallic stents to prevent biliary obstruction

by a remaining large stone as an emergency measure about 2 years before in another hospital, because the operative lithotomy was not indicated for heavy congestive heart failure.

At admission, her white blood cell count was 11,300/ $\mu\text{I}$ , red blood cell count was  $448 \times 10^4/\mu\text{I}$ , hemoglobin was 14.0 g/dl, platelet count was  $17.1 \times 10^4/\mu\text{I}$ , aspartic aminotransferase (AST) was 62 IU/l, alanine aminotransferase (ALT) was 107 IU/l,  $\gamma$ -glutamyl transpeptidase was 296 IU/l, total bilirubin was 8.1 mg/dl, and direct bilirubin was 6.28 mg/dl.

The patient was treated by percutaneous transhepatic biliary drainage (PTCD) and antibiotics, under diagnosis of AOPC. The PTCD and cholangiogram revealed that there was a large stone on the EMS positioned over the sphincter. The type of the EMS was Accuflex<sup>®</sup> stent (8 mm diameter) (**Fig. 1**).

After general condition of the patient had improved, we tried to break the stone with a crusher catheter through the PTCD channel, but we failed in this attempt, because the basket wire was caught in the edge of the stents. Then we crushed the stone by extracorporeal shock-wave lithotripsy (ESWL) and removed the fragments of the stone by percutaneous transhepatic cholangioscopy (PTCS) and with a basket catheter. The stone was 98% cholesterol.

The EMS was not buried under the mucous, except for a small part of the stents wire, which cut slightly into the mucous. On the other hand, some fibrin-like fluff stuck to the inside of the stents wall (**Fig. 2**).

The removal of the EMS was performed after complete removal of the stones was confirmed. We removed the EMS with a cholangioscope and normal biopsy forceps through the transhepatic channel under fluoroscopy. First, we grasped a wire at the end of the round hem of the EMS. Then we drew it into the channel of the endoscope in order to unravel the knitted wire (**Figs. 3, 4**). The EMS was finally pulled out through the endoscope channel, leaving the endoscope in the common bile duct. Once it started to unravel, we achieved removal within a few minutes.

While removing the EMS, the biopsy forceps slipped off the wire, and the wire was cut several times by rubbing it against the rim of the channel of the cholangioscope. However it was easy to operations by, grasping the end of the wire again (**Fig. 5**).

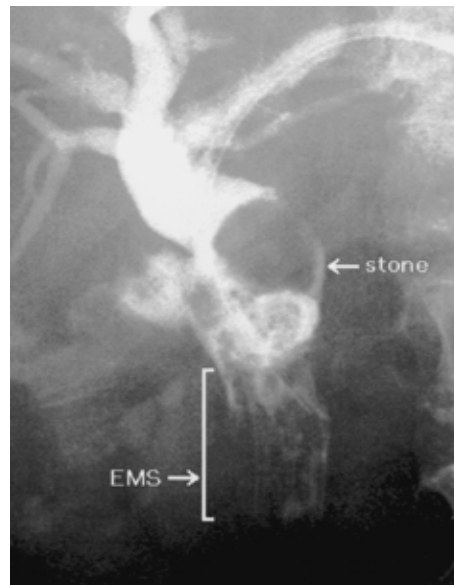


Fig. 1 Cholangiography on 8 days after PTCD puncture. A large stone was on the EMS positioned over the sphincter. The type of the EMS was Accuflex<sup>®</sup> (8mm diameter).

While pulling it out from the buried mucous slight bleeding was observed, but this did not prevent completion of the procedure (**Fig. 6**).

## Discussion

Most relapses of biliary strictures are considered to be caused by sludge and biliary stones formed from the EMS core<sup>2,5,7</sup>. However, in this case, the AOPC was caused by retained stones or recurring stones. Neither was caused by the EMS itself.

Although the EMS had been left for a long time in the common bile duct, it was not buried in mucous. On the other hand, some fibrin-like fluff stuck to the inside of the stent wall (**Fig. 2**). It seemed to shove the contrast medium from the stents, and the X-ray cholangiography seemed to show that the stents was buried in mucous (**Fig. 1**).

Prevention is most important for iatrogenic biliary strictures. Unfortunately, when biliary strictures occur, we need to consider operative repairs or application of a stent tube for the strictures. Still it was not reported sufficient experience of EMS for benign biliary strictures.

In this case, the type of the EMS was Accuflex<sup>®</sup> stent. As has been mentioned, the etiology of obstruc-

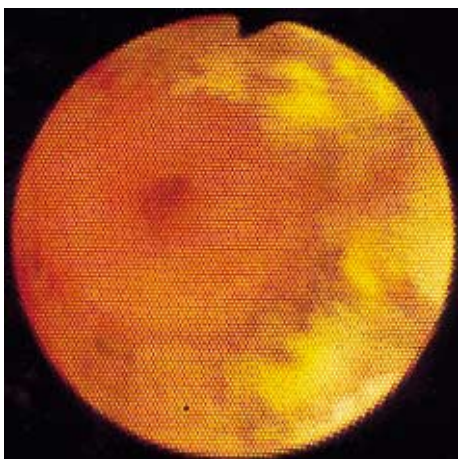


Fig. 2 PTCS picture after removal of bile duct stones. Inside of the EMS wall was mossy with some fibrin-like fluff.

tion was a common bile duct stone. Practical application of this removing technique should be limited to cases of ordinary relapses of biliary strictures. However the removal was much easier than we expected, even though the stents tube had been in place for 2 years. This is thought to be an important factor in considering the indication of EMS for benign biliary strictures and in selecting the type of EMS.

Part of this article was presented at the 67th Kanto Area Congress of Japan Gastroenterological Endoscopy Society.

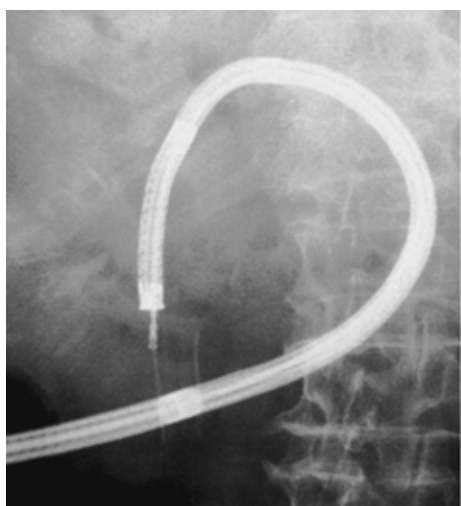


Fig. 3 A hem of the EMS was grasped by normal biopsy forceps to start removal of the stent.

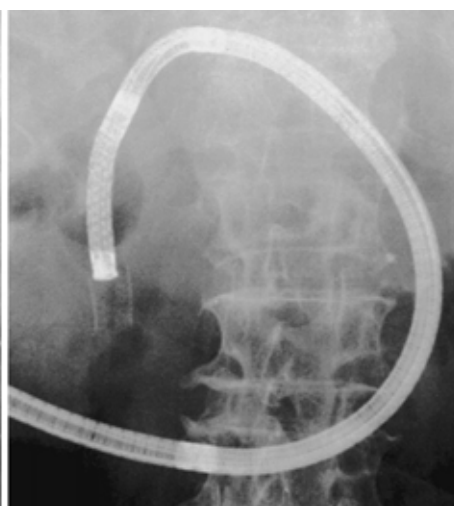


Fig. 4 The wire was drawn into the channel of the endoscope in order to unravel the knitted wire.

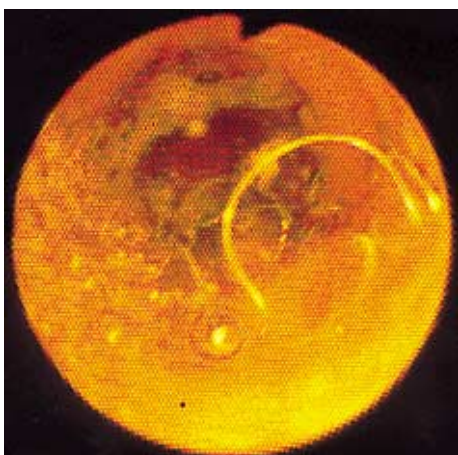


Fig. 5 A fragment of the wire left in the bile duct. It was easy to resume the extraction by grasping the end of the wire again.

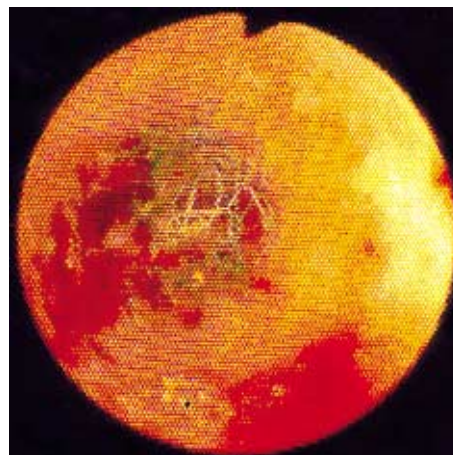


Fig. 6 Slight bleeding observed. It did not prevent the procedure. Once the EMS started to unravel, we could remove it within a few minutes.

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