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Two Effective Cases of Expandable Metallic Stents (EMS) Placed in Patients with Posttraumatic Extrahepatic Biliary Duct Strictures

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We had good results from using expandable metallic stents (EMS) in two patients with posttraumatic extrahepatic biliary duct strictures. A transpapillary biliary stenting (TBS) was performed on one patient, and a percutaneous transhepatic biliary stenting (PTBS) was performed on the other patient. In both cases, cholangitis and obstructive jaundice were cured. Both methods of stenting were performed safely with low invasion. Therefore, EMS is an effective treatment means for benign biliary duct strictures including posttraumatic biliary duct strictures.

Introduction

Expandable metallic stents (EMS) is frequently used for reducing jaundice in patients with inoperable malignant biliary duct strictures. This has been reported to be advantageous for improving QOL[1)~3)]. EMS was recently used for two patients with extrahepatic biliary duct strictures that developed after traumas, and there were good results. The cases were as follows.

Cases

Case 1: Transpapillary biliary stenting (TBS)

Patient: Male aged 52 years

Case history: The patient's chest and abdomen were caught between a wall and a crane truck while working on April 13, 1999. The patient was taken to our hospital by ambulance in a state of severe shock. The patient suffered from multiple traumas (hemopneumothorax on both sides of the body, flail chest, hepatic injury, and open fractures of both humeri). The injuries were treated as follows. For the abdominal region, the right hepatic lobe was excised for the hepatic injury (IIIb)[4)] (Fig. 1). The postoperative course was satisfactory, and the patient was released from the hospital on June 22. Then, the patient began to develop fevers from around September, and repeatedly developed fevers and moderate jaun-

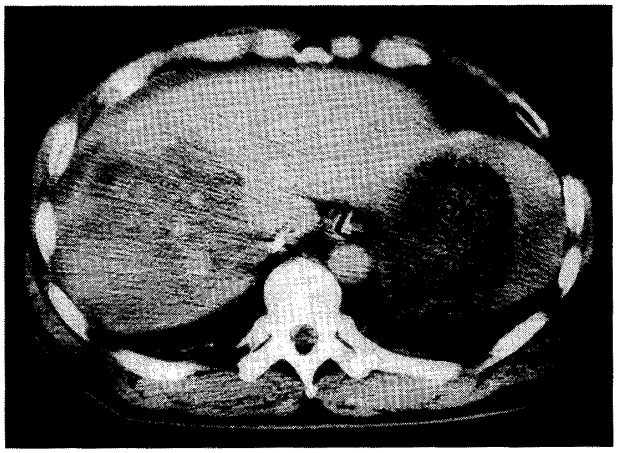

Fig. 1 Abdominal CT at the time of the trauma
IIIb-type hepatic injury: deep injury complex type

dice once every two months. The patient was diagnosed with cholangitis due to the posttraumatic biliary duct stricture, and was re-admitted on February 16, 2000. A common biliary duct stricture was observed in the magnetic resonance cholangio-pancreatography (MRCP) (Fig. 2), and an endoscopic retrograde cholangio-pancreatography (ERCP) was performed (Fig. 3) which was immediately followed by a transpapillary biliary stenting (TBS; Boston Scientific; Biliary Wallstent 8F Placehit 10 mm in diameter and 50 mm in length, Biliary Balloon Dilatation Catheters 24F 4 cm) (Fig. 4). After performing the TBS, the development of the fevers and jaundice was alleviated. It has been 11 months since the TBS was performed, but no complications have been observed (Fig. 5).

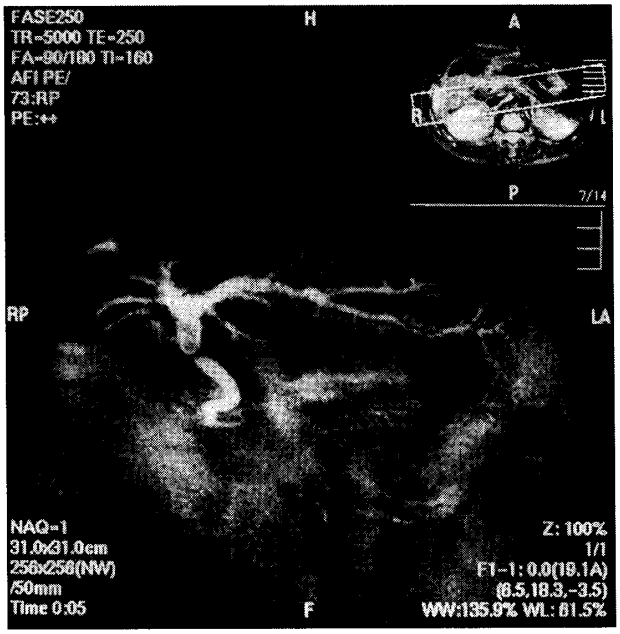

Fig. 2 MRCP (common biliary duct stricture)

Case 2: Percutaneous transhepatic biliary stenting (PTBS)

Patient: Male aged 55 years

Case history: The patient fell off the bed of a truck (from a height of about 3 meters) while lying on his belly on April 4, 2000, and severely hit his abdomen. An emergency operation for the traumatic stomach rupture and the pancreatic in-

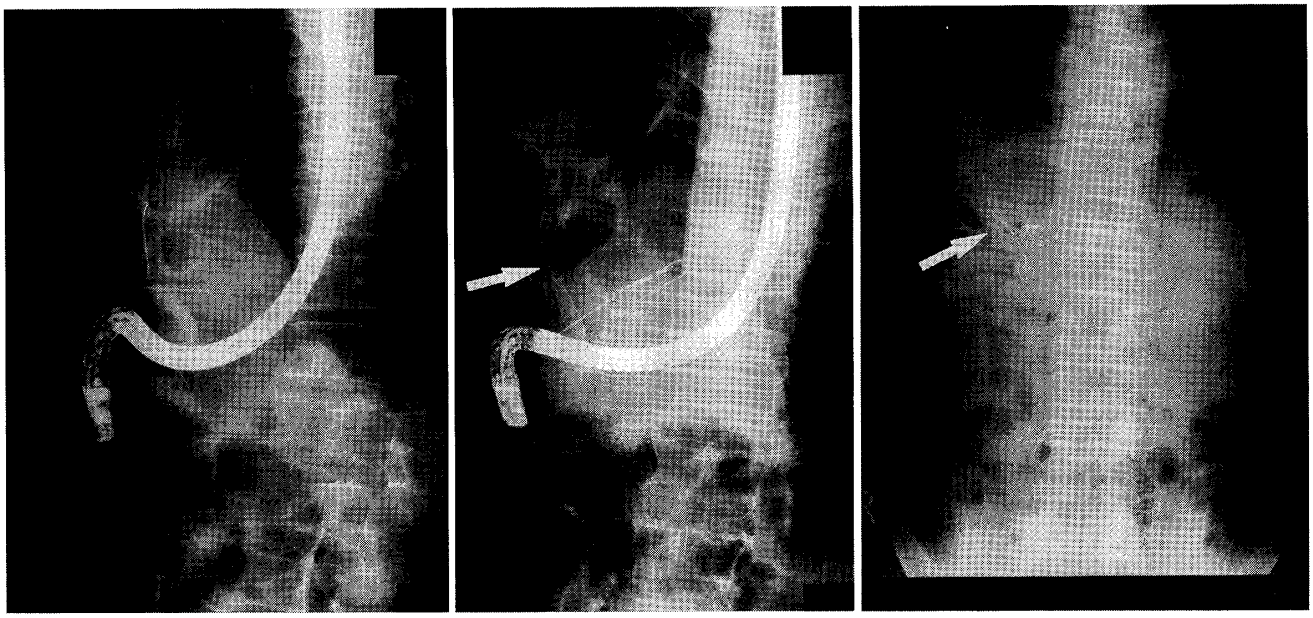

Fig. 3 Fig. 4 Fig. 5

Fig. 3 ERCP (marking on the site of the common biliary duct stricture)
Fig. 4 Placing of the stent (immediately after placing the EMS)
Fig. 5 Simple X-P on the abdominal site after 10 months.
The stent is good for expansion without migration.

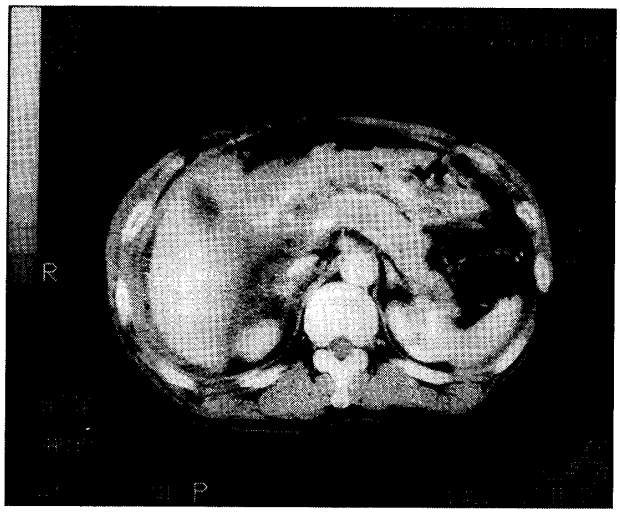

Fig. 6 CT at the time of suffering the trauma
Abdominal free-air, and a pancreatic injury were suspected.

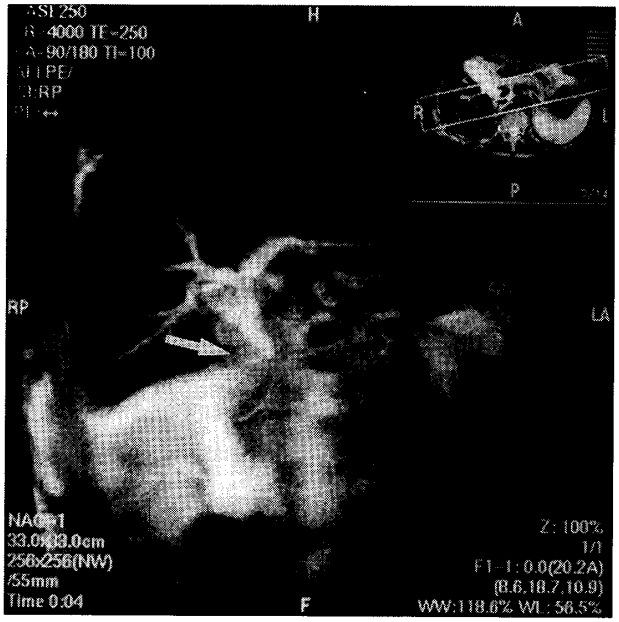

Fig. 8 MRCP (the stricture of the common biliary duct, and high flexion)

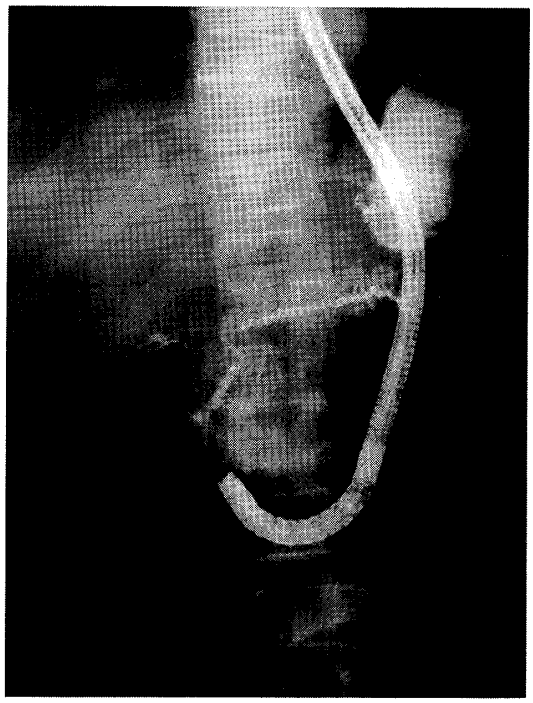

Fig. 7 ERCP
The pancreatic duct alone was radiographed, but the common biliary duct could not be observed.

jury I-type[5] was performed on the same day with subtotal gastrectomy B-II "reconstruction, and suture at the head portion of the pancreas" (Fig. 6). Even though the patient developed obstructive jaundice from April 9 on, this was relieved with conservative treatment. The patient was released from the hospital on June 9. Then, the patient developed fevers and jaundice once every two weeks and was re-admitted on July 28. Conservative treatment with fasting, intravenous drips, and antibiotics was performed, and at the same time a variety of examinations were carried out. From the findings of ERCP (Fig. 7), MRCP (Fig. 8), and percutaneous transhepatic cholangiodrainage (PTCD) (Fig. 9), the patient was diagnosed with posttraumatic biliary duct stricture, and given percutaneous transhepatic biliary stenting (PTBS) (7Fr introducer, SCHNEIDER Biliary Wallstent with 9 mm in diameter and 59 mm in length) (Figs. 10, 11). The patient made satisfactory progress after the operation. It has been six months since the operation, but no complications from placing the EMS have been observed.

Discussion

Extrahepatic biliary duct injuries due to blunt traumas are comparatively rare[6]. Furthermore, it is extremely rare that patients are diagnosed

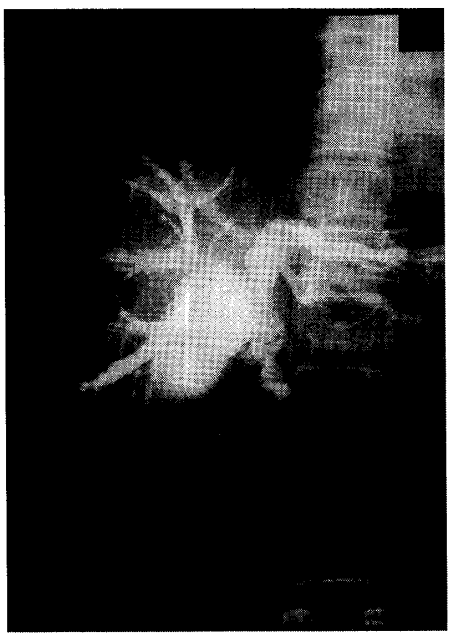

Fig. 9

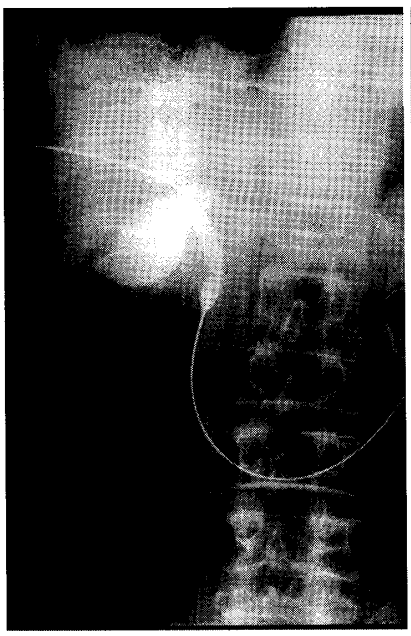

Fig. 10

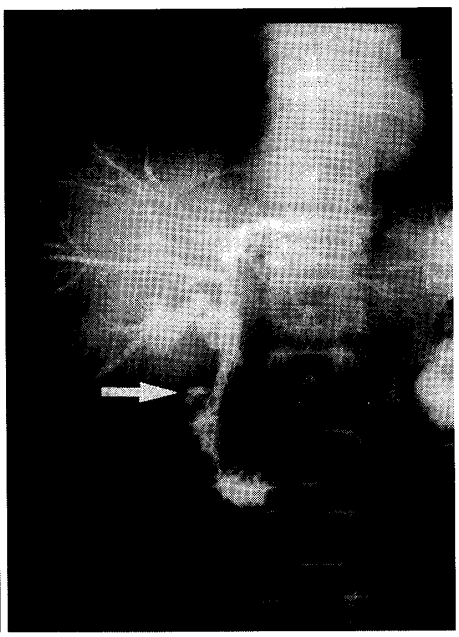

Fig. 11

Fig. 9 PTCD (expansion of the intrahepatic biliary duct/the common biliary duct, and the flexion of the common biliary duct)
Fig. 10 Placing of the stent (placing of the dilatation balloon by using the guide wire from the PTCD tube)
Fig. 11 Placing of the stent (immediately after placing the EMS)

with extrahepatic biliary duct injuries before surgery. In almost all cases, these injuries are found by chance when sectioning the abdomen to examine for other injuries of the intraperitoneal organs. When there are hematomas in the hepatoduodenal ligament, then biliary duct injuries are apt to be overlooked. Therefore intraoperative cholangiography should still be carried out to scrutinize the biliary tract system as much as possible even if biliary duct injuries are not macroscopically observed. In the case of emergency operations on patients with serious multiple traumas like those above, it is doubtful if time can be spared to perform the intraoperative cholangiography. Accordingly, we can only select treatment methods for individual cases.

Some theories including pressing, increasing internal pressure, and expanding have been reported as the cause of posttraumatic biliary duct strictures. We think that the two cases discussed above were due to the rupture of the mucous layer of the common biliary duct and the subsequent fiberization of the biliary duct.

The effectiveness of EMS has been demonstrated as a therapeutic means for inoperable malignant diseases in the organs. The safety of placing stents in human bodies for a long period of time has not yet been established, however, and so the application of EMS to benign diseases should be made with care. In these two cases EMS was a safe therapeutic means with low invasion, and no complications from the EMS placement were observed. Therefore, we think that this treatment method can be an effective therapeutic means for posttraumatic biliary duct strictures.

The features of the two methods implemented required us to devise how to perform these methods. It seems that the percutaneous transhepatic biliary stenting is superior to the transpapillary

biliary stenting in reliability, but the former has many problems including the danger of causing fistulae, complicated handling of drainage tubes, pains after treatment, and reduction in QOL due to the restriction of body movement[7][8]. On the contrary the transpapillary biliary stenting can be performed immediately after the ERCP and is superior in quickness[9][10]. In carrying out the percutaneous transhepatic biliary stenting, it is important to advance the wire by adjusting the position of the catheter so as to advance the guide in the running direction of the stricture site. In the second cases mentioned above, therefore, it was very effective that the puncture was made as far as possible in a straight line from the site of the biliary obstruction. Furthermore, the EMS was positioned by using an endoscope in combination. This made it possible to adjust the minute position of the exposed part from the duodenum papilla to the inner cavity of the duodenum, and enabled us to safely carry out the treatment.

Later complications due to the placement of stents including migration, cholangitis, and liver abscess have been reported[11][12]. It is also necessary, from the long-term point of view, to pay attention to carcinogenicity. We think that it will be our task in the future to develop the means to easily remove stents that become unnecessary or cause serious complications after placement.

Conclusion

The expandable metallic stents (EMS) were placed in two patients with posttraumatic extrahepatic biliary duct strictures. This treatment was carried out safely and with low invasion. EMS is an effective means for treating benign bile duct strictures. (That may be permitted depending on the situation-severe adhesion for post-operation, for example)

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外傷後の肝外胆管狭窄に Expandable Metallic Stents（EMS）留置が有効であった2例

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外傷後肝外胆管狭窄の2例に expandable metallic stents（EMS）を使用し良好な結果を得たので報告する．経乳頭的ステント留置術を1例，経皮経肝的ステント留置術を1例に施行したところ，2例とも胆管炎，閉塞性黄疸は治癒した．両方法とも低侵襲で安全に施行でき，外傷後胆管狭窄など良性の胆管狭窄に対する有効な治療手段と考えられた．