CASE REPORT

A New Method for One Stage Bilateral Internal Drainage in Klatskin Tumor with Biliary Obstruction

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Klatskin tumors and other hilar lesions often require stent insertion for relief of biliary obstruction. Plastic stents result in incomplete drainage and are easily obstructed. Self-expandable metallic stents are too expensive and difficult to exchange. We designed a special two-tailed plastic stent for this clinical condition and circumvented the above setbacks. We placed our novel stent into a patient with obstructive jaundice secondary to Klatskin tumor, in whom we already had employed techniques such as percutaneous transhepatic cholangiography plus drainage and endoscopy biliary drainage; neither of which proved effective. Following placement of this novel stent, bile and debris drainage increased tenfold with prompt resolution of clinical symptoms and elevated serum bilirubin. Furthermore the stent remained patent until the patient expired two months later. We also designed the stent so that it would be suitable for repeat irrigation, bilateral drainage, and easy exchange. In conclusion, this novel stent merits further study for bypassing hilar lesions and relieving bile outflow obstruction.

Key words: **Klatskin tumor , hilar cholangiocarcinoma , bilateral biliary drainage**

Klatskin tumors are cholangiocarcinomas localized at the bifurcation of the common hepatic bile duct in the liver hilum. Such tumors are rare but they constitute approximately 30% of extrahepatic cholangiocarcinomas [1]. The clinical presentations include obstructive jaundice, cholangitis, sepsis and shock. Early stent insertion and bile drainage is the most effective palliative treatment for avoiding such complications. Management options include percutaneous transhepatic cholangiography and drainage (PTCD), endoscopic retrograde biliary drainage (ERBD), and endoscopic nasal biliary drainage (ENBD). The choice of therapeutic procedure depends on the clinical situation.

Unresectable hilar malignant strictures with

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obstructive jaundice are best managed by drainage of both liver lobes through bilateral PTCD. Unfortunately, many patients cannot undergo this procedure due to practical and clinical considerations such as poor location for tube insertion, a great vessel near the dilated duct, lack of obvious intrahepatic dilatation, and presence of coagulopathy or ascites. We present a new endoscopic method for successful internal drainage of both liver lobes by insertion of a novel stent via the intrahepatic ducts. This stent was constructed using a short P-duct tube (5-Fr, 7cm, Olympus) introduced to the side slit (knife cutting edge) of a long ENBD tube (7Fr, 250cm tube, Olympus) (Figures 1-4). It was inserted by using two guide wires and a flexible endoscope (Fugi ED-450XL8, Fujinon) into the Klatskin tumor of a patient with bilateral biliary obstruction unsuitable for PTCD. Due to its successful clinical outcome in our patient, we would like to present a detailed case report.

CASE REPORT

A 57 y/o female patient was admitted on May 14, 2005 due to progressive jaundice, tea-colored urine, and pale colored stools for 14 days prior to admission. She had been blind since childhood due to an unknown cause, and her only other medical history was essential hypertension, which had been under control for 20-30 years. On physical examination, the patient's consciousness was clear and she appeared to have general malaise and icteric sclera and skin. Her neck was supple and without jugular engorgement and lymphadenopthy. Her breathing sounds were clear, her abdomen was soft, and she had no tenderness or rebounding pain. Her bowel sounds were normal and there was no peripheral edema. Laboratory values on admission included aspartate aminotransferase of 192 U/L, alanine aminotransferase of 356 U/L, direct bilirubin of 12.1 mg/dL, and total bilirubin of 13.9mg/dL, hemoglobin of 14.5g/dL and white blood cells of 6,600/ul, platelets of 82,000/ul, and a prothrombin time of 22.9 seconds. Negative HBsAg and anti-HCV serology was noted. Abdominal ultrasonography showed liver cirrhosis, a hilar tumor, and bilateral intrahepatic duct dilatation with splenomegaly.

Magnetic resonance cholangiopancreatography with contrast enhancement was performed on May 14, 2005. This confirmed bilateral biliary obstruction, a Klatskin tumor and liver cirrhosis (Figure 5). The patient's clinical picture worsened and her total bilirubin level progressed from 13.9mg/dL to 16.5mg/dL 2 days after admission. Endoscopic retrograde cholangiopancreatography (ERCP) and ERBD was performed May 18, 2005. Unfortunately, the patient's bilirubin level persistently progressed to 24.2 mg/dL 3 days later. ERCP

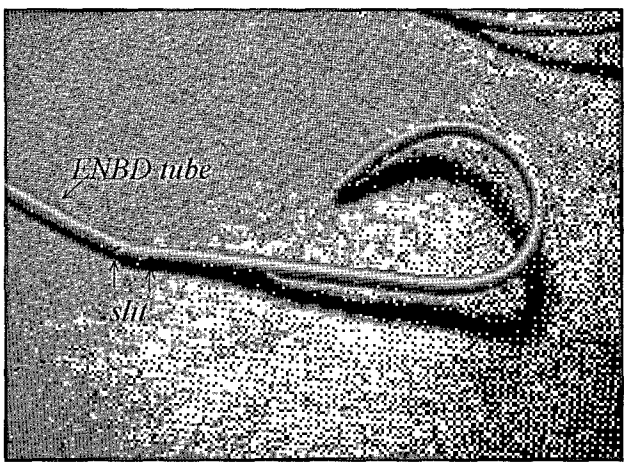

Fig.1

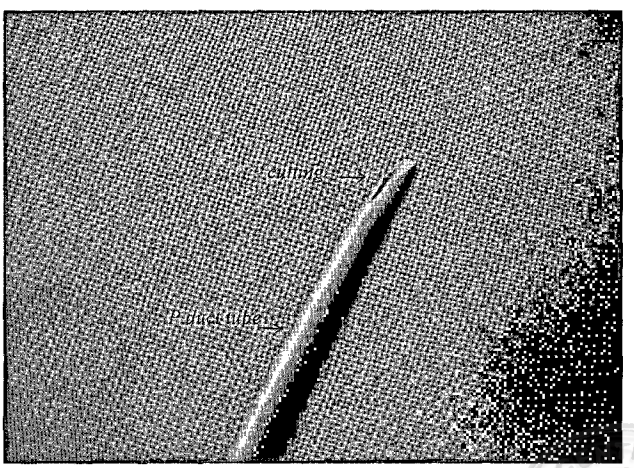

Fig.2

and ENBD were repeated on May 21, 2005. During ENBD, the tube was frequently irrigated, but there was little bile drainage, except for some debris. Consequently the patient's symptoms worsened corresponding to a further rise in serum bilirubin to 26.2 mg/dL 2 days later, and her blood pressure started to drop. Given failure of current treatment and further consideration, we decided to construct a novel stent using the 5-Fr P duct tube and one 7-Fr ENBD tube. First, we cut two slits with a sharp knife on the upper end side hole of the ENBD tube (Figure 1). Second, we made an oblique cut in the upper end of the P-duct tube from the lower slit hole to the upper slit hole of the ENBD tube and fixed the top of the P-duct tube just beyond the slit to avoid ENBD tube obstruction (Figures 3 and 4). Fourth, we then inserted this novel stent using a flexible endoscope and two guide wires (Figures 6 and 7). After stent insertion, we injected contrast media, which showed bilateral intrahepatic duct patency.

With this stent in situ, the bile drainage volume increased from 45mL per day to 300-500mL per day, and patient's bilirubin level started to be regress from 26.2mg/dL and 20.7 mg/dL three days later. The patient's discomfort and appetite improved, and color returned to her stool. After her condition stabilized, she was transferred to Chang Gung Memorial Hospital, Kaohsiung, Taiwan for liver transplantation. Unfortunately, she was not a suitable candidate for liver transplantation and died 2 months later due to progressive hepatic failure. The special stent remained patent and continued to function for more than 2 months, until the patient expired.

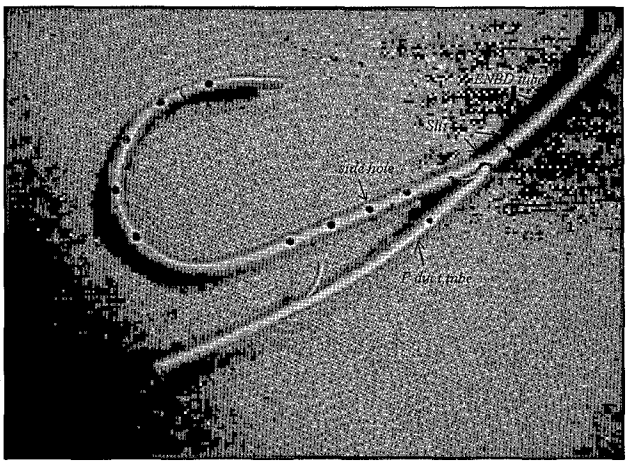

Fig.3

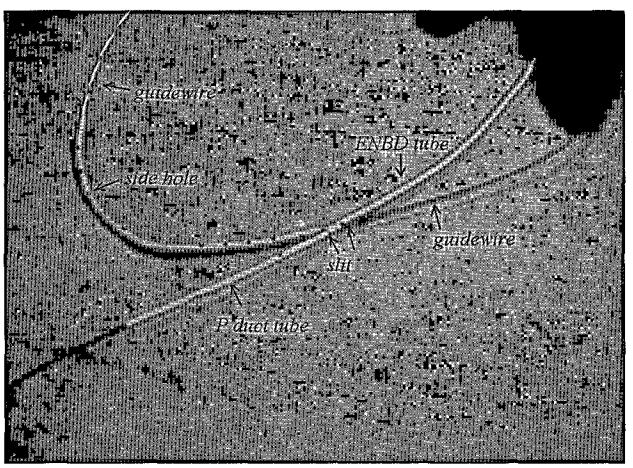

Fig.4

DISCUSSION

Cholangiocarcinoma localized at and obstructing the bifurcation of the common hepatic bile duct obtained the name Klatskin tumor from Gerald Klatskin, who in 1965 described 13 cases and characterized this type of choliangiocarcinoma [2]. Patients died more from the biliary obstruction than from the tumor itself. Thus, for unresectable hilar tumors complicated by bilateral lobe

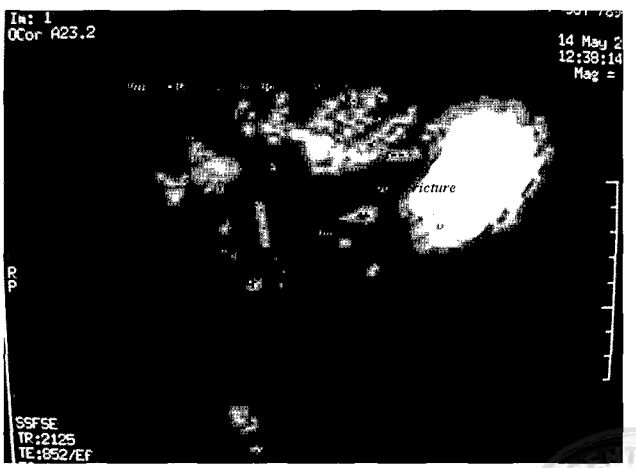

Fig.5

biliary obstruction, treatment of the latter is critical to the patient's short-term survival and quality of life.

Endoscopic or percutaneous bile drainage possess different advantages and disadvantages, depending on the clinical situation. Endoscopic biliary drainage is the preferred primary treatment among patients with unresectable malignant biliary stricture, mainly because it is simpler and less invasive than the percutaneous route [3]. Due to failure of one-way ERBD and ENBD from repeated obstruction and inadequate drainage, we were forced to solve the problem with this new method as detailed above.

In 1992, Kubota et al. used percutaneous transhepatic cholangioscopy for bilateral internal drainage of biliary hilar malignancy [4]. The percutaneous route was not suitable for our patient due to her low platelet count, coagulopathy and ascites. In 2003, Schiefke performed self-expandable metallic stent placement for 13 Klatskin tumor patients using a flexible endoscope [5]. Although he reported a success rate of 100%, the cost was extremely effective and the stents could not be repeatedly irrigated. Thus, these stents were not suitable for our patient. In another paper published in 1994 by Hu et al, 288 patients with hilar tumors who underwent endoscopic biliary drainage were analyzed [6]. The total effective rate was 67.0% and one of the conclusions was that jaundice could be relieved if more than about 40% of the liver was drained. The double stents for the left and right intrahepatic duct enlarged the drainage area and improved the therapeutic effectiveness. In 1998, Dumas mentioned that plastic stents often result in incomplete drainage and subsequent cholangitis [7]. We believe that the reason for incomplete drainage of the plastic stents may be due to inadequate irrigation and resultant tube narrowing and obstruction.

Fig.6

Fig.7

In conclusion, the stent we designed is suitable for patients with Klatskin tumors and other causes of induced hilar stricture and obstructive jaundice. The advantages of the stent include low cost, repeated irrigation, bilateral lobe drainage, endoscopic route, and no penetrating wound. The stent merits further investigation for treatment of patients with Klatskin tumors and hilar biliary stricture.

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Klatskin tumor 合併雙側膽管阻塞使用新的雙側引流管

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Klaskin tumor及其它膽管癌經常會造成膽管的狹窄及阻塞需要放置支架引流，一般常使用的塑膠支架經常會不完整引流甚至阻塞，金屬支架則價錢昂貴且不易更換，因此我們特地設計可雙邊引流塑膠支架以解決上述問題，我們將此支架放置於一名Klaskin tumor的女性病人，這病人因凝血功能異常及腹水不適合經皮穿肝引流，內視鏡引流包括內引流及經鼻膽引流經常容易被壞死組織阻塞而達不到充份的引流效果，而這病人換成新設計的引流管雙側同時引流配合不時的灌注清洗，病人的膽汁引流量從每天45cc增加到每天300-500cc，病人的黃膽指數迅速下降而整體狀況大幅改善，這引流管持續正常引流直到病人兩個月後因肝衰竭過逝，這引流管的特性不僅容易清洗，雙側引流並且容易更換，非常適合這類的病人，臨床上仍需更多病人使用以改進。

關鍵字：Klaskin tumor、肝門膽管癌、雙側膽管引流