

Unilateral Multiple Metallic Stent-in-stent for a Case of Hilar Biliary Cancer: An Alternative Stenting Strategy

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ABSTRACT

The stenting strategy has been discussed in cases with unresectable hilar bile duct cancer (HBDC). We describe here a case of HBDC, 4 cm in size, invading the right portal vein and hepatic artery, which was only treated with repeated metallic stent placement, and the patient survived for a long period (51 months). Against Bismuth type-IV hilar biliary stricture, our strategy was to maintain the drainage of the largest, viable hepatic area (>50% of total liver) by unilateral multiple stent-in-stent.

Key Words: Cholangitis, hilar biliary cancer, metallic stent, prognosis, stent-in-stent

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There has been much debate about the strategy of stenting-plastic or metallic, unilateral or bilateral, and partial stent-in-stent or side-by-side-in cases of unresectable hilar bile duct cancer (HBDC);^[1-9] however, the efficacy of unilateral stent-in-stent has hardly been considered. We herewith report a case with advanced HBDC treated by endoscopic multiple metallic stenting in unilateral stent-in-stent fashion, and the patient survived for a markedly long period with this approach.

CASE REPORT

An 80-year-old female was referred to Shizuoka Cancer Center for investigation and treatment of jaundice. On computed tomography (CT) [Figure 1], a 40-mm ill-enhanced tumor was located at the hepatic hilum, widely attached to the hepatic artery and portal vein (mainly in the right lobe), with multiple lymphadenopathies. CT volumetry^[10] showed

a larger volume in the left lobe (left: 621 ml, right: 582 ml). The patient refused surgery, chemotherapy, and percutaneous transhepatic biliary drainage (PTBD) due to her age and quality of life considerations; therefore, the strategy employed was to rescue the largest, viable hepatic areas^[3] by simple stenting. Endoscopic retrograde cholangiography (ERC) demonstrated severe stenosis at the superior common bile duct, but the left hepatic duct was successfully delineated after probing with the guidewire (Bismuth type-IV) [Figure 2a]. After the forceps biopsy, which confirmed adenocarcinoma, and balloon dilation, an uncovered expandable metallic stent (EMS) was inserted [Figure 2b]. This procedure has stabilized the patient's condition for nearly 2 years with complete resolution of jaundice [Table 1]. Afterward, endoscopic perampullary EMS was repeatedly placed to expand the biliary lumen against the tumor's ingrowth. Each of the initial three stents lasted for at least 5 months, after which stent patency was shortened. Plastic stents were sometimes examined, but they failed within a few weeks. For more than 4 years, she mostly stayed at home with good performance status except for the short admissions for biliary stenting. Additional drainage to the right lobe was not needed. However, the seventh EMS [Figure 2c] was effective for only 50 days, and PTBD was finally performed. Soon after PTBD, there was a rupture of esophageal varices, associated with the cancer involving the portal veins. Although variceal ligations were successful, the patient gradually weakened and succumbed 51 months after diagnosis.

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DISCUSSION

The choice of stenting has been an issue in cases with unresectable HBDC, either plastic or metallic, and unilateral or bilateral. While using multiple EMSs, another decision that needs to be taken is on the stents' formation, side-by-side or partial stent-in-stent. With these devices in stenting and even with photodynamic therapy, median survival of the unresectable HBDC was reported to be 4-16 months.^[2-8] In this case, we gave weight to the patient's quality of life and chose to keep drainage from the left liver, a largest, viable hepatic section, by multiple metallic stent-in-stent fashion. This strategy seemed to increase the survival of the patient up to a 51 months after the diagnosis.

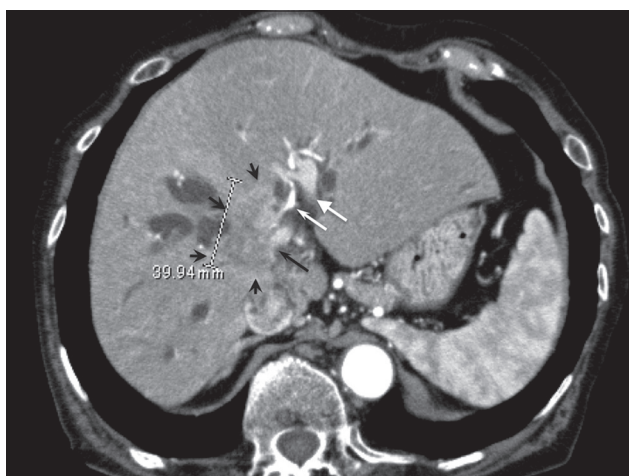


Figure 1: Computed tomography showing a bulky low-density mass at the hepatic hilum predominantly in the right lobe (arrowheads), involving the right portal vein (black arrow), and attached to the left hepatic artery (white arrow) and nearly intact left portal vein

Advantages in using EMS against plastic stent in unresectable HBDC have been reported in recent studies done on a large number of cases.^[7,9] In retrospective studies, EMS showed a longer period of patency and a lower incidence of complications,^[6,9] including cholangitis, stent occlusion, migration, and perforation, compared with plastic stent. Higher rate of successful drainage and longer period of survival in the use of EMS were also proven by a prospective randomized study.^[7] In our case, the plastic stent lasted only a few weeks, whereas the EMS worked for 3-5 months. Today, plastic stent is treated as an option when patient's survival is to be predicted less than 3 months.^[11]

Several studies have compared the outcome between unilateral and bilateral stenting in cases with HBDC; however, no definitive conclusion has been obtained so far. In a study, bilateral stenting revealed a higher patency rate.^[6] Meanwhile, another study demonstrated a higher rate of cholangitis and no merit in bilateral stenting compared with unilateral stenting.^[12] Besides, in either style of bilateral metal stents, side-by-side or partial stent-in-stent, technical problems exist for the stenting itself and also for the management of subsequently evolving complications. Actually, unilateral metal stent has been advocated by some studies as being sufficient and straightforward and its use avoids the more complex and risky procedures of bilateral stenting.^[13,14]

Prediction of drainage effectiveness is necessary to choose which area should be drained in cases with HBDC. Vienne *et al.* retrospectively studied 107 cases of malignant hilar strictures and demonstrated that draining >50% of the liver volume is a predictor of good drainage effectiveness with fewer occurrences of cholangitis and longer survival period.^[3] In our case, the volume of left lobe accounted

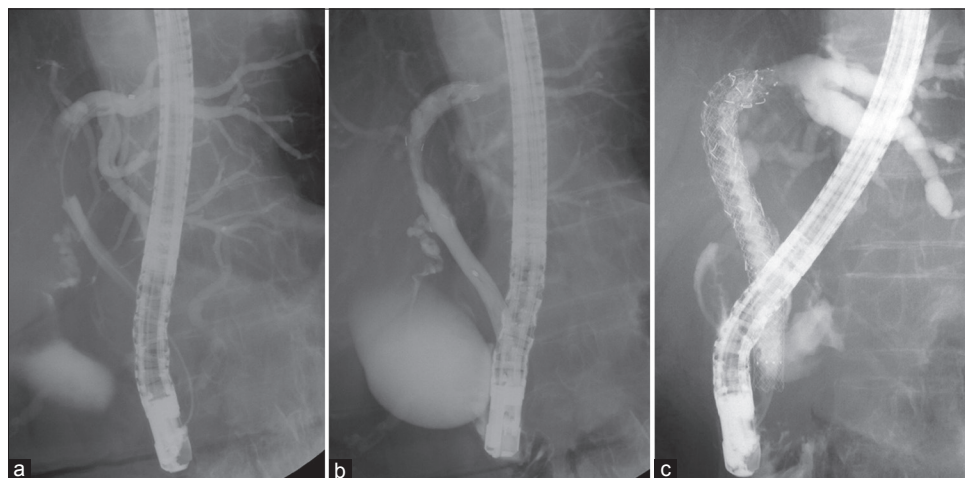


Figure 2: (a) Endoscopic retrograde cholangiography showing complete obstruction of the right hepatic duct and a long segment of stenosis between the left hepatic duct and the upper common bile duct (Bismuth type-IV). (b) An initial uncovered expandable metallic stent (EMS) was used. (c) Seventh EMS placed in multiple stent-in-stent fashion at 50 months after the insertion of the first EMS

Table 1: Stents used in the present case by stent-in-stent fashion

Turn	Type of stent	Size		Balloon dilation	Patency
		Caliber	Length (cm)		
1	UEMS [#]	10 mm	6	+	1 year 10 months 3 weeks
2	UEMS [#]	10 mm	6	+	10 months
3	UEMS [#]	10 mm	6	+	5 months 2 weeks
4	PS	7 Fr	10	-	3 weeks
5	UEMS [#]	10 mm	8	+	3 months
6	PS×2	7 Fr	10	+	1 week
		8 Fr	8		
7	UEMS [§]	8 mm	8	-	3 months
8	UEMS [¶]	8 mm	8	+	2 months 3 weeks
9	UEMS [‡]	8 mm	8	+	1 month 3 weeks

UEMS: Uncovered expandable metallic stent ([#]Niti-S large cell, Taewoong, Gimpo-si, South Korea; [§]WallFlex™, Boston Scientific, Natick, MA, USA; [¶]X-Suit NIR®, Olympus, Tokyo, Japan; [‡]Zeo stent plus, Zeon Medical, Tokyo, Japan), PS: Plastic stent

for >50% of the total liver and the large vessels flowing in the left lobe were almost free from cancer invasion, suggesting sufficient drainage effectiveness would be obtained only with the unilateral stenting. As a result, we completely followed the algorithm of palliative biliary drainage proposed by Asia-Pacific Working Group for hepatobiliary cancer.^[11]

However, the difference between the present case and the past reports was in the choice of rescue procedure when the stent was occluded. In the literature reports, plastic stents had been inserted through the EMS; however, we restricted the use of plastic stents to a few occasions and simply repeated EMS placement for seven times by stent-in-stent fashion. By using balloon dilation, stenotic biliary lumen was successfully expanded and EMS could be deployed without stress. Stent migration and compression of the portal vein are considered as possible complications. Cost effectiveness should also be explored in future studies with a large number of cases.

In conclusion, when drainage volume is assessed to be enough, unilateral multiple metallic stent-in-stent can be a choice of endoscopic stenting strategies in cases with Unresectable hilar biliary cancer.

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