Endoscopic Bilateral Metallic Stenting for Malignant Hilar Obstruction Using Newly Designed Y Stent: Case Report

Malign Hiler Tıkanıklıkta Yeni Tasarlanmış Y Stent Kullanılarak Endoskopik Bilateral Metalik Stentleme

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ABSTRACT Palliative treatment of malignant hilar biliary obstruction (MHBO) is difficult. To circumvent this problem, a "Y-stent" has been designed which consists of two uncovered self–expanding metallic stents (SEMS): the first SEMS has a radiologically marked segment with wider mesh holes in its middle part, through which the second stent is delivered on the other side. We report three cases of MHBO, which were palliatively treated using this biliary Y-stent. From 2011 to 2012, three consecutive patients with unresectable MHBO of Bismuth type III or greater underwent placement of Y-Stent. Before Y-Stent placement, all the patients underwent endoscopic bilateral biliary drainage using two plastic stents. Technical success was achieved for all 3 patients. Stent occlusion did not occur up to date (more than a period of 220 days) except in one who died from heart failure. In conclusion the Y-stent appears to effective and safe for the management of MHBO.

Key Words: Stents; biliary tract neoplasms; klatskin's tumor

ÖZET Malign hiler biliyer darlıkların palyatif tedavisi zordur. Bu sorunu aşmak için, iki adet kapsız kendiliğinden genişleyen metalik stent (SEM) den oluşan bir "Y" stent tasarlanmıştır: birinci SEM'in orta kısmında radyolojik olarak işaretlenmiş, içinden ikinci bir stentin geçebileceği geniş bir örgü deliği mevcuttur. Bu yazıda, biliyer Y-stent kullanılarak palyatif olarak tedavi edilen malign biliyer darlıklı üç olgu sunuldu. 2011'den 2012'ye kadar, Bizmuth tip III veya daha yüksek malign hiler biliyer darlığı olan üç ardışık hastaya Y-Stent yerleştirildi. Y-Stent yerleştirilmesinden önce hastalara 2'şer adet plastik stent kullanılarak bilateral biliyer drenaj uygulandı. Üç hastada da teknik başarı sağlandı. Kalp yetmezliğinden ölen biri dışındakilerde bugüne kadar (220 günden daha fazla bir sürede) stent tıkanıklığı görülmedi. Sonuç olarak malign hiler biliyer tıkanıklığın tedavisinde Y-Stent etkili ve güvenli görülmektedir.

Anahtar Kelimeler: Stentler; safra kanalı tümörleri; klatskin tümörü

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Endoscopic biliary drainage using self-expandable metallic stents (SEMS) is considered the procedure of choice for palliation of unresectable malignant hilar biliary obstruction. Although the necessity of bilateral stent placement for patients with this disorder remains controversial, bilateral biliary drainage is necessary when unilateral drainage cannot relieve jaundice or when initial unilateral drainage is complicated by contralateral cholangitis. Nevertheless, endoscopic bilateral drainage using SEMS is challenging and demands technical expertise.[1-4]

Recently, new metallic stents specially designed for bilateral drainage to facilitate contralateral stent deployment through the interstices of the

first metallic stent have been reported.[5,6] The center of these stents is looser than the other parts, making them suitable for bilateral drainage with a second stent which is delivered on the other side (Figure 1).

We report here three cases of malignant hilar biliary obstruction, which were palliatively treated using this biliary Y-stent.

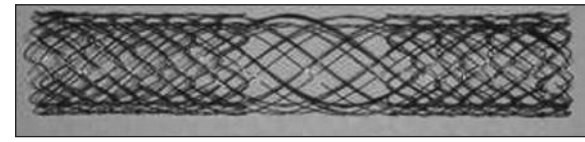

FIGURE 1: Niti-S biliary Y stent with central wide-open mesh.

CASE REPORTS

From October 2011 to February 2012, a total of three consecutive patients with unresectable malignant hilar biliary obstruction of Bismuth type III or greater underwent placement of Y-Stent. Prophylactic treatment with broad-spectrum antibiotics was initiated before the procedure and continued for 5 days thereafter. Full and informed consent was obtained from all patients.

CASE 1

A 76-year-old woman presented with jaundice of 6 weeks duration, and with weight loss and pruritus. Abdominal computed tomography (CT) confirmed the existence of a hilar mass, which was surgically unresectable. Endoscopic retrograde cholangiopancreatography (ERCP) revealed hilar cholangiocarcinoma with a Bismuth type III anatomical configuration. A 0.035-inch guide wire was negotiated into the left biliary system and a 14 cm plastic stent was placed over this guide wire. But the bilirubin level increased from 10 mg/dL to 14 mg/dL after stent placement. She underwent percutaneous transhepatic biliary drainage for right biliary system because we could not cannulate to right hepatic duct during ERCP. The bilirubin level decreased to 10 mg/ dL, but cholangitis, perihepatic fluid collection and small abscess developed. Another 14 cm plastic stent was placed to right biliary system during second ERCP (Figure 2a) but, the high level of bilirubin (10 gm/dL) persisted. For

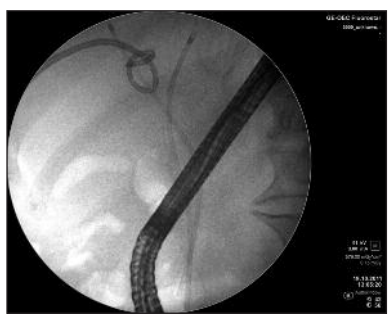

FIGURE 2a: Another plastic stent was placed to right biliary system during second ERCP.

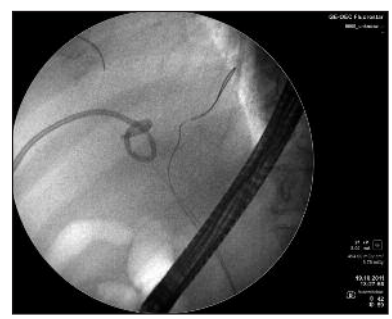

FIGURE 2b: Two guide wires were left into the right and left biliary system during the removal of plastic stents.

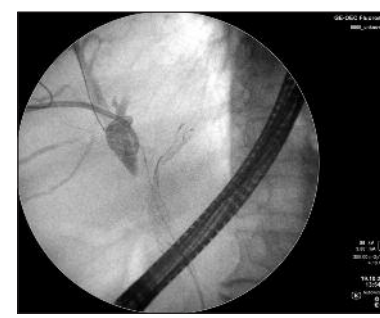

FIGURE 2c: First SEMS was deployed over left guide wire.

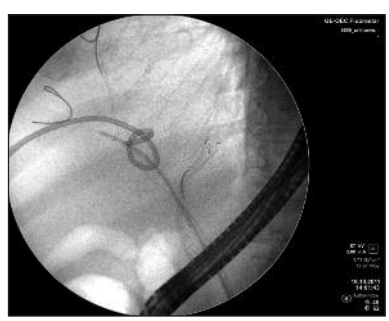

FIGURE 2d: A third guidewire passed through the gap in the first SEMS into the right ductal system.

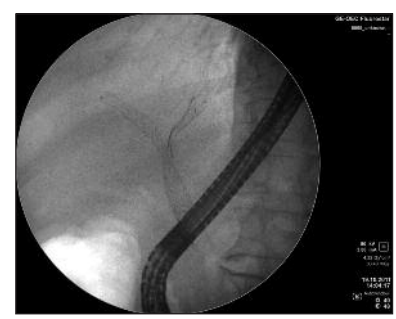

FIGURE 2e: Second SEMS was deployed in a "Y" fashion and drainage catheter was removed.

this reason we decided to metallic stent insertion. Two guide wires were negotiated into the right and left biliary system. The first SEMS was deployed over left guide wire, with the wider mesh holes positioned below the bifurcation. A third guidewire was then passed through the gap in the first SEMS into the right ductal system, over which the second SEMS was deployed in a "Y" fashion (Figure 2b, 2c, 2d, 2e) and percutaneous drainage catheter was removed. The bilirubin level decreased to normal level and infection disappeared after stent placement. Stent occlusion did not occur up to date (more than a period of 265 days).

CASE 2

A 46-year-old woman with a history of prior pelvic surgery due to ovary cystadenocarcinoma presented with jaundice of 2 weeks duration. Abdominal CT confirmed the existence of a hilar mass, which was surgically unresectable. ERCP revealed malignant hilar obstruction with a Bismuth type III anatomical configuration. Two plastic stents were placed to right and left biliary system. The bilirubin level decreased from 13 mg/ dL to normal level. After 4 months, the bilirubin level increased to 4.8 mg/dL. The plastic stents were replaced with the Y Stent (Figure 3a, 3b, 3c, 3d). The bilirubin level decreased to normal, again. Stent occlusion did not occur up to date (more than a period of 179 days).

CASE 3

A 72-year-old man with a history of inguinal hernia presented with jaundice of 1 week duration, and with fever and emesis. The bilirubin was found 11.4 mg/dL. Abdominal CT confirmed the existence of a hilar mass with malign ascites, which was surgically unresectable. ERCP revealed malignant hilar obstruction with a Bismuth type IV anatomical configuration. Two plastic stents were placed to right and left biliary system. The bilirubin level did not decrease below to 10 mg/dL and fever persisted. Therefore, the plastic stents were replaced with the Y Stent after 5 days (Figure 4a, 4b, 4c, 4d). The bilirubin level decreased from 10 mg/dL to 5 mg/dL and fever disappeared. Unfortunately, the patient died from heart failure after 4 days.

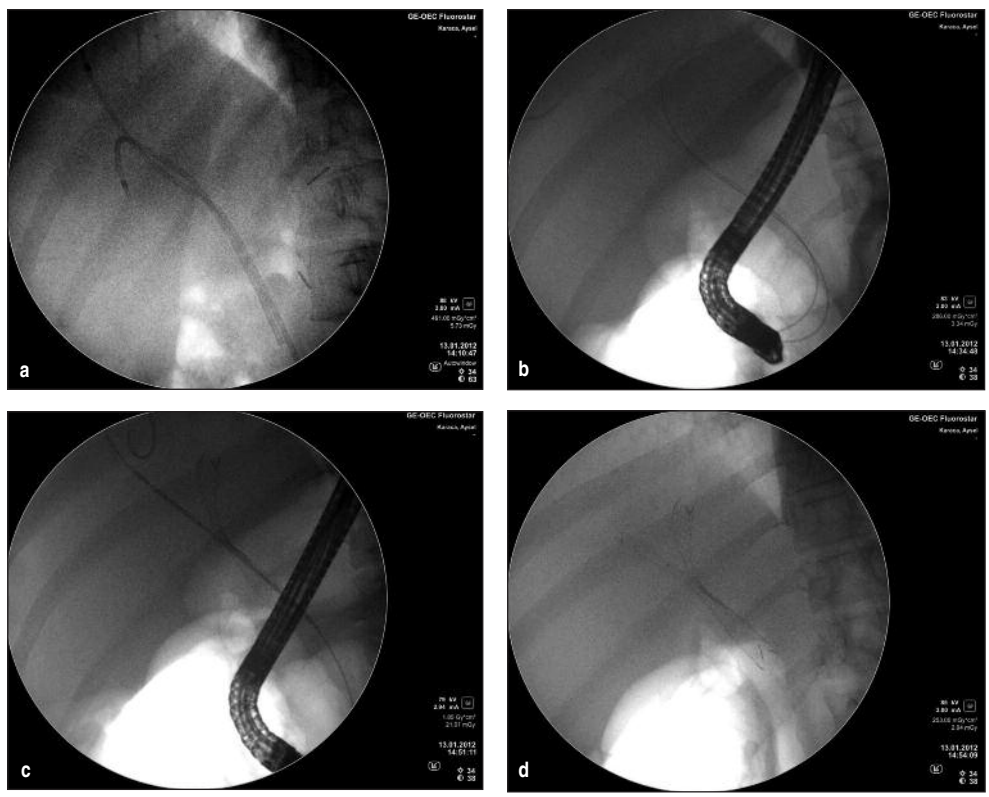

FIGURE 3a-d: The plastic stents were replaced with the Y Stent in Case 2.

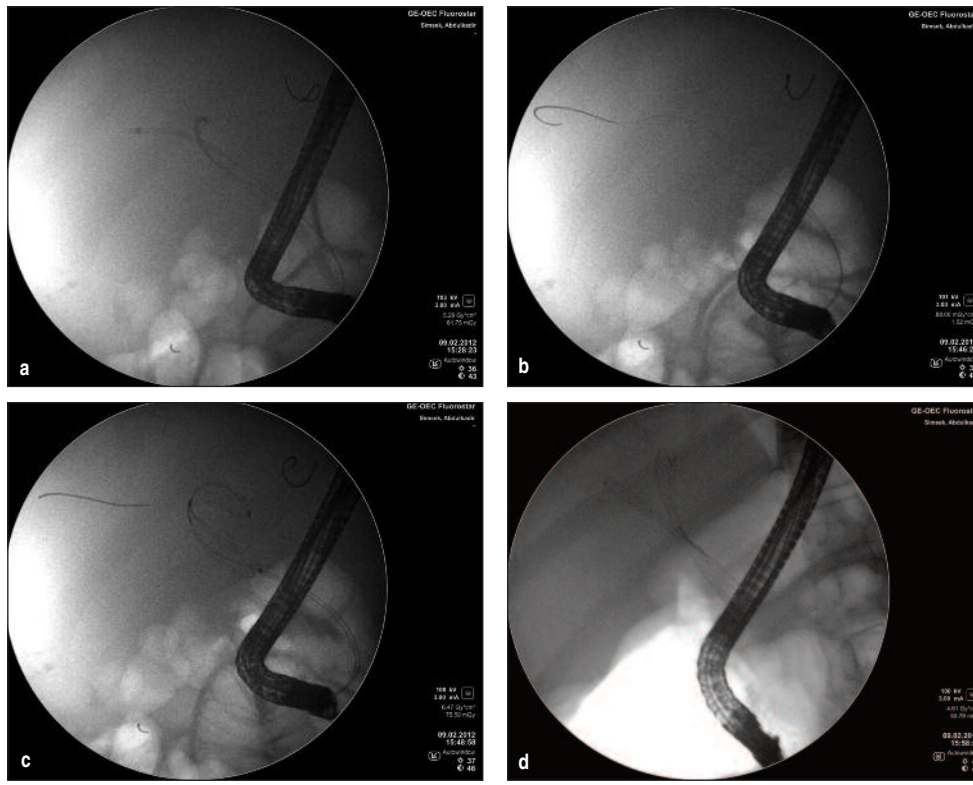

FIGURE 4a-d: The plastic stents were replaced with the Y Stent in Case 2.

DISCUSSION

Although the necessity for drainage of both liver lobes is still controversial in Bismuth type II, III, and IV strictures, bilateral drainage is more physiologic than unilateral drainage.[1,7-10] But the difficulty of insertion has, hitherto, limited its use.

Silverman and Slivka used a 7F Soehendra stent extractor to create an approximately 8F fenestration through the mesh of a preexisting stent.[11] However, it is difficult to cannulate to the desired contralateral duct through the preexisting SEMS with a guidewire. It also takes time to produce a fenestration and to increase the diameter of the fenestration, because of the tight weave of the stent material.

Bilateral drainage was most commonly accomplished through an endoscopic approach in parallel arrangement as in the studies by Dumas et al and Cheng et al.[12,13] It has some problems and difficulties, such as the potential entanglement of 2 guidewires; the fragility and dislodgement of the stents; and difficulty of exact positioning of both stents so that their ends are juxtaposed, ensuring complete drainage. These technical difficulties, relative complexity, and lower successful rate compared with unilateral stent insertion cause endoscopists to avoid bilateral biliary-stent insertion.[2]

Recently, a newly designed Y-shaped stent with 8-mm interstices in the middle portion of the stent was introduced for stent-in-stent placement of bilateral metal stents in patients with malignant hilar biliary strictures in a single-center pilot study.[14] The central open mesh facilitates insertion of the second stent into the contralateral bile duct. Y-stents shorten relatively less (10%) than other metal stents (15%-30%). Thus, accurate deployment is achieved, and misplacement rarely occurs. When placement of bilateral metal stents fails, the central mesh of the first stent also aids insertion of the second stent into the contralateral bile duct through a transhepatic approach. Because the distal portions of 2 stents are located in the same space, the common hepatic and bile duct, a large luminal diameter throughout the biliary system is

obtained without any dislodgement of the first stent or disruption of the secondary delivery system. The occlusion rates for Y-stents were reportedly 25% with a median patency of 217 days by the endoscopic approach and 18% with a median patency of 170 days by the T-configured percutaneous approach.[5,14] Similarly, in our patients, stent occlusion did not occur up to date (more than a period of 220 days).

More recently, the occlusion rate for the crosswired BONASTENT (Standard Sci Tech Inc., Seoul, Korea) without the wide wire mesh design was reported to be 6%, with a median patency of 150 days.[15] This newly designed metal stent has a nitinol wire with a high degree of flexibility and elasticity, a narrower stent mesh, a thin delivery shaft and good pushability. In this study, however, median patency was found lower than Y-stent, although occlusion rate was better.

Y-stent and BONASTENT were limited in positioning because the central portion of the stent had to be placed at the hilar bifurcation. Furthermore, these stents are not suitable for unilateral biliary drainage because of their wider mesh holes. To overcome this disadvantage, a uniform large cell stent (LCD Stent) with sufficient radial force for both uni-and bilateral drainage has been developed. Unfortunately, overall stent occlusion rate was 50% in a new LCD-stent study, although median stent patency period was 202 days.[16]

It seems that, there are a lot of advantages and disadvantages of the new stents used for bilateral biliary drainage. In our patients, Y-shaped stent had a high success rate and comparable stent patency duration, thus we think that this technique is feasible for most therapeutic endoscopists and allows bilateral internal drainage of the both ductal systems via an endoscopic approach in most patients.

CONCLUSION

In conclusion, although Y-stent appears to effective and safe for the management of malignant hilar biliary obstruction, the interstices in the confluent portion may be vulnerable to tumor ingrowth or overgrowth because of the wide wire mesh design. We think that more studies are needed, because of the limited number of patients and the short-term follow-up.

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