Stent Placement in Perihilar Cholangiocarcinoma

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Perihilar or hilar cholangiocarcinoma is an adenocarcinoma of the bile ducts arising from the main right or left hepatic ducts or their biliary confluence.[1] Perihilar cholangiocarcinoma is associated with a poor prognosis and a 5-year overall survival rate less than 10%.[2] Surgical resection is the only potentially curative treatment for perihilar cholangiocarcinoma.[1] Eighty to ninety percent of patients, however, are not surgical candidates and should be considered for palliative therapies, including biliary drainage, most commonly with endoscopic stents.[2-4] Percutaneous biliary drainage can be considered as well but is less comfortable for the patient, often requires an external drainage bag, and usually requires more maintenance than endoscopic stents. Palliative endoscopic biliary drainage leads to improved quality of life by relieving jaundice and its associated symptoms, such as diarrhea, sleep pattern disturbances, anorexia, and pruritus.[2,5,6] This review is focused on the utility of metal stents versus plastic stents (PSs) and unilateral stents versus bilateral stents in these patients.

Metal Stents Versus PSs

For more than 30 years, PSs have been used to provide endoscopic biliary drainage.[7-9] PSs are easy to insert, are removable, and are less expensive than self-expanding metal stents (SEMSs), although PSs are much narrower.[9] PSs are still widely used for perihilar cholangiocarcinoma, especially in pretransplant patients (Fig. 1). Unfortunately, PSs have a shorter period of patency than SEMSs, and clogging can progress to jaundice and/or cholangitis.[10] PS clogging is thought to be multifactorial and associated with bacterial contamination of undrained bile ducts.[9,11,12] PSs may be a viable option for patients with a short life expectancy (usually defined as less than 3 months). The prophylactic administration of antibiotics, the administration of ursodeoxycholic acid, and the utilization of wider PSs have been evaluated as ways of reducing PS clogging, but the benefits have been limited.[9,13,14]

SEMSs were developed to overcome the limitations of PSs.[9,15] In patients with hilar obstructions, uncovered SEMSs are generally used to prevent obstruction of the contralateral biliary system.[9] SEMSs have been found to have higher insertion and patency rates than PSs. SEMSs are typically placed in patients with unresectable disease (Fig. 2). Raju et al.[16] found that the median patency times were 1.86 months with PSs and 5.56 months with SEMSs ($P < 0.0001$) in patients with cholangiocarcinoma. On average, 4.60 and 1.52 reinterventions were performed for the PS and SEMS groups, respectively. In a study comparing biliary drainage in stents, SEMS patients had a higher rate of successful drainage than patients with PSs (70.4% versus 46.3%, $P = 0.011$).[17] In another study comparing SEMSs to PSs in cholangiocarcinoma, long-term stent failure (>30 days) occurred in 50% of the PS patients and in 18.2% of the SEMS patients, although the results did not reach statistical significance.[18]

SEMSs are associated with fewer adverse events than PSs. Adverse outcomes (stent occlusion, migration, cholangitis, perforation, and a need for unplanned endoscopic retrograde cholangiopancreatography/percutaneous transhepatic cholangiography) were measured in a study by Perdue et al.[10] Adverse outcomes occurred in 39.3% of the PS patients and in 11.8% of the SEMS patients ($P = 0.017$).

Unilateral Stents Versus Bilateral Stents

The need for bilateral stents versus unilateral stents in all patients with cholangiocarcinoma is debatable. Unilateral stent placement is sufficient in many cases because only 25% to 30% of the liver needs to be drained to relieve jaundice.[19] However, many centers today prefer bilateral stents because they are more effective in terms of biliary drainage and cumulative stent patency.

Abbreviations: PS, plastic stent; SEMS, self-expanding metal stent.

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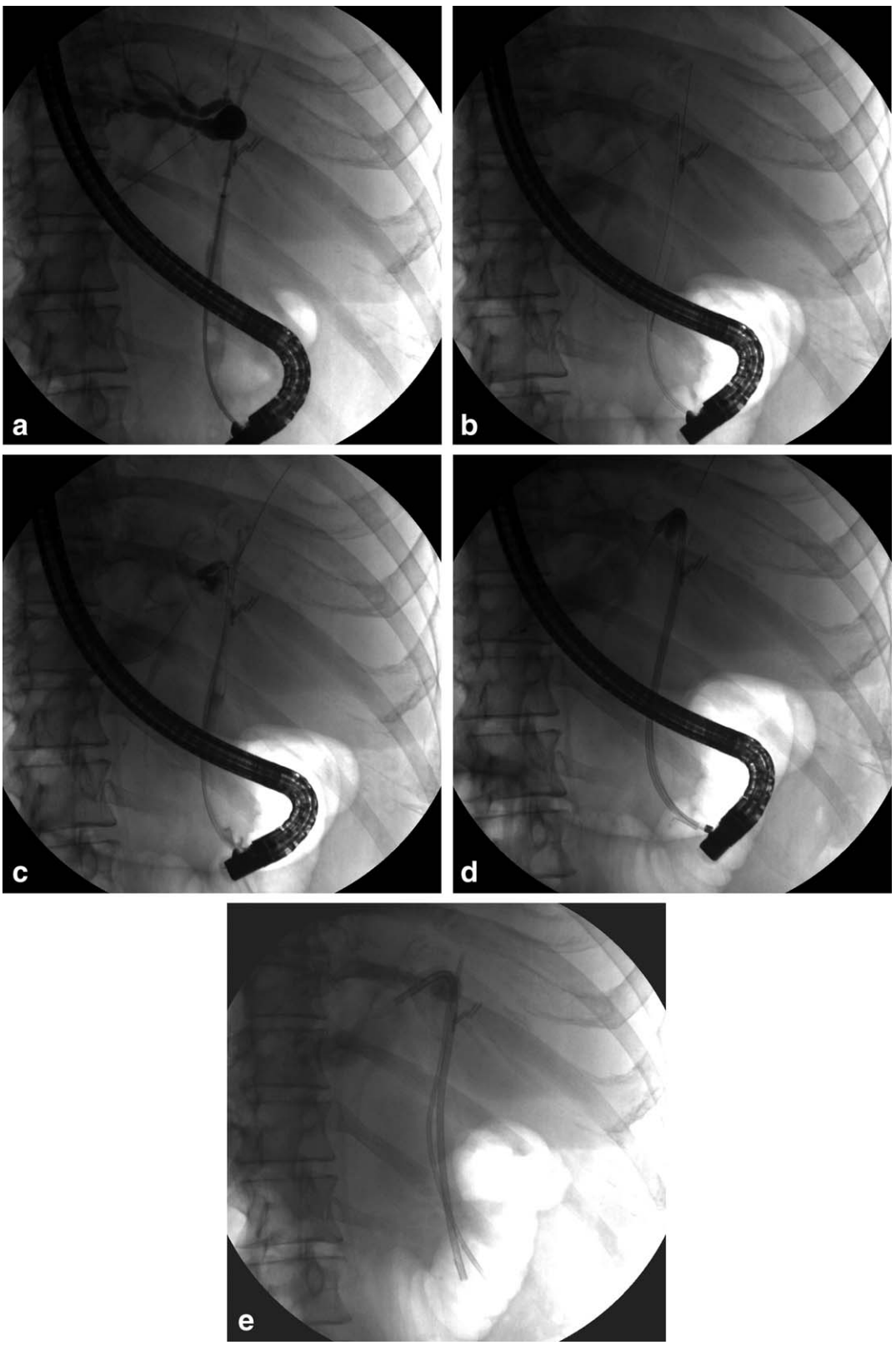

Figure 1 Bilateral PS placement for perihilar cholangiocarcinoma in a pretransplant patient. (A) An occlusion cholangiogram shows a tight hilar stricture. (B) With two separate guidewires, bilateral biliary access is obtained. (C) Contrast injection confirms good bilateral wire placement. (D) A long 8.5-Fr PS is placed into the left biliary system. (E) A long 7-Fr PS is placed into the right biliary system. The patient now has bilateral biliary drainage.

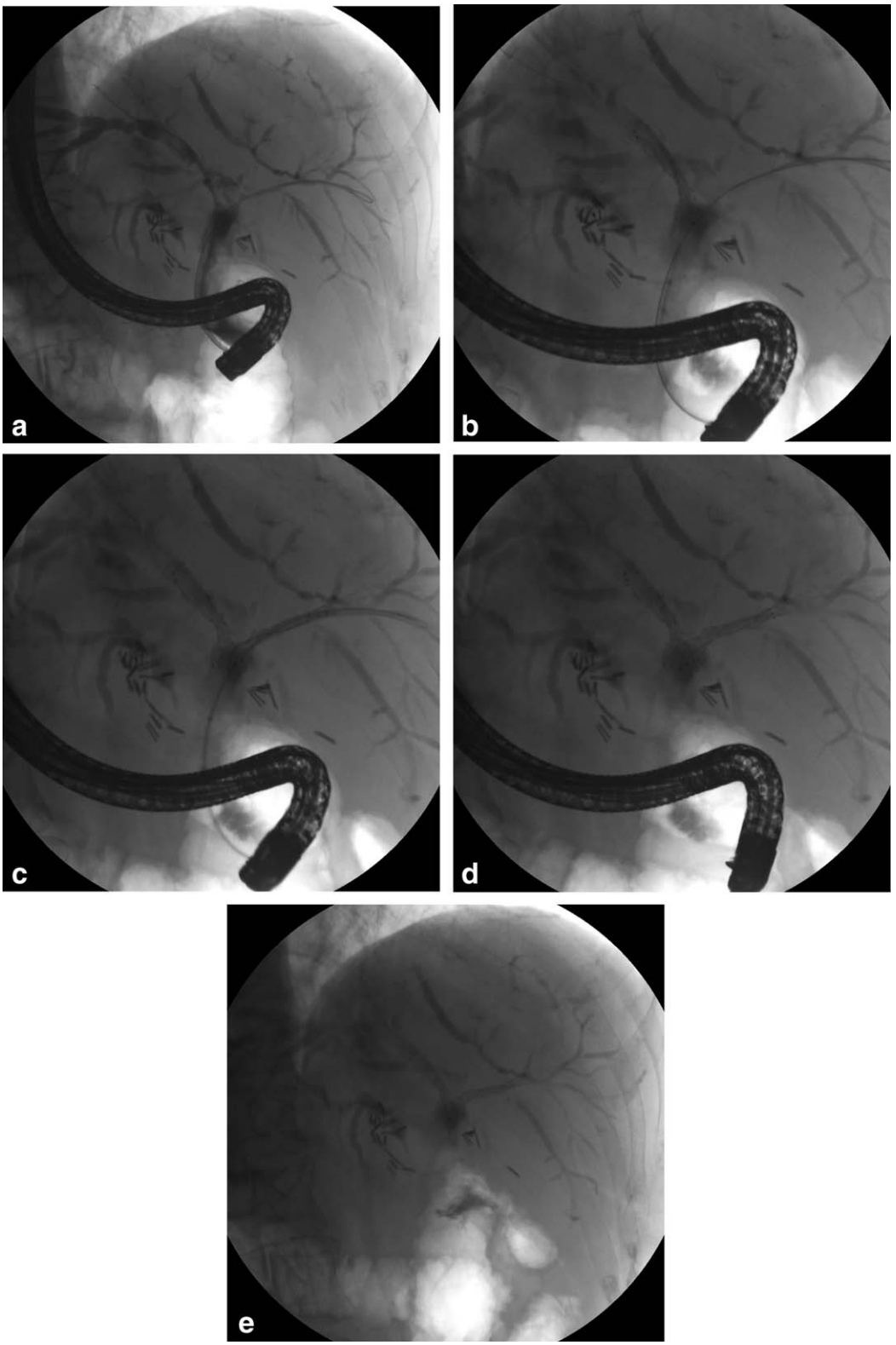

Figure 2 Bilateral SEMS placement in a patient with unresectable perihilar cholangiocarcinoma. (A) A cholangiogram reveals a malignant obstruction of the left hepatic duct, right hepatic duct, and bifurcation. Bilateral guidewire access is obtained. (B) An SEMS is deployed across the left hepatic duct. (C) An SEMS is deployed across the right hepatic duct. (D) The appearance of bilateral stents immediately after their deployment is shown. (E) The final appearance of the stents after endoscope withdrawal is shown (note the lower magnification).

A retrospective study of 106 patients by Vienne et al.[20] examined the volume of liver drainage with respect to outcomes. That study found that draining more than 50% of the liver volume, which frequently required bilateral stent placement, was associated with longer median survival for patients with hilar cholangiocarcinoma (119 versus 59 days, $P = 0.005$). The study also found that patients were less likely to develop cholangitis when the drained liver volume was more than 50% (55% versus 30%, $P = 0.03$).

In a study of 46 patients comparing bilateral and unilateral SEMSs, the cumulative stent patency period was significantly longer for the bilateral stent group (488 versus 210 days).[21] Superior cumulative stent patency rates with bilateral SEMS or PS placement were also seen in a retrospective study by Liberato and Canena[22] when they compared them to unilateral SEMSs or PSs. If bilateral stents are used, preprocedural imaging (computed tomography and/or magnetic resonance imaging with magnetic resonance cholangiopancreatography) is recommended in order to identify the dominant biliary system in the event that only one side can be drained.

Complications

Despite the advantages of SEMSs, these devices can become clogged by stones or become obstructed via tumor ingrowth or overgrowth.[10,13,22-24] A recent retrospective study by Siddiqui et al.[25] found that metal stent occlusion in cholangiocarcinoma was directly related to the stage of disease, with more advanced tumors resulting in faster SEMS occlusion. Age, sex, stricture length, and SEMS diameter and length were not associated with SEMS patency. Other complications of biliary stenting have included stent migration, pancreatitis, cholecystitis, cholangitis, perforation, fistula formation, and bleeding.[10,22,26,27]

Conclusions

Perihilar cholangiocarcinoma is associated with a poor prognosis. The majority of patients are not surgical candidates and require palliation. Biliary stenting is commonly used for the palliation of perihilar cholangiocarcinoma and is associated with improved quality of life. Currently, uncovered SEMSs and PSs are used for the endoscopic drainage of perihilar cholangiocarcinoma. In comparison with PSs, SEMSs are associated with fewer complications. Our general preference is to use metal stents in these patients because of their superior patency rates, although we use PSs in some patients in accordance with the overall clinical situation. Although unilateral stent placement provides sufficient drainage in many cases, bilateral stents are recommended when they are possible in order to maximize biliary drainage. ■

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