Delayed Severe Hemobilia Due to Bilio-venous Fistula After Percutaneous Transhepatic Biliary Drainage: Treatment With Covered Stent Placement

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Biliovenous fistula occurs due to development of a communication between hepatic duct and portal vein branches and is a rare complication of percutaneous transhepatic biliary drainage (PTBD). Most of them are self-limiting and only occasionally they need interventional management. Placement of biliary stent graft is a viable option. We present here a case of a 56-year-old male with carcinoma of gall bladder presenting with hemodynamic shock due to severe hemobilia after PTBD and treated successfully by biliary covered stent placement. (J CLIN EXP HEPATOL 2016;6:241–243)

Percutaneous transhepatic biliary drainage (PTBD) is a standard treatment for improvement of liver functions and relief of jaundice in patients of malignant biliary obstruction.¹ The technique has a technical success rate of more than 90% and clinical success rate of more than 75%.^{2,3} Complications associated with the procedure are seen in about 10% of patients and severe hemorrhage is seen in about 2.3% cases.^{4,5} The etiology of severe after PTBD include arterio-biliary fistula, porto-biliary fistula, pseudoaneurysms and deranged coagulation parameters.^{6,7} Biliovenous fistula is a rare complication, seen in less than 0.5% cases, with few cases reported in literature.^{4,8–12} These cases are either managed conservatively or by radiological interventions in the form of balloon occlusion, coiling or covered stent placement depending on patient's hemodynamic status.^{4,8–11} We report a case of 56-year-old male with carcinoma of gall bladder, who developed bilio-venous fistula 3 weeks after PTBD and presented with features of hemodynamic shock and was managed by placement of biliary covered stent.

CASE REPORT

A 56-year-old male patient presented to gastrointestinal surgery out patient clinic with history of jaundice and pain abdomen for 2 months. Clinical examination revealed icterus. Per-abdominal examination was unremarkable. Ultrasonography was done, which showed a mass replacing the gall bladder with dilatation of bilobar intrahepatic biliary ducts. Subsequently, contrast enhanced computed tomography (CT) scan was done, which showed a heterogeneously enhancing mass replacing the gall bladder and involving the primary biliary and right secondary biliary confluence and right hepatic artery. Since, the volume of segments 2 and 3 of liver was small, surgery was deferred. The patient was referred for biliary drainage. Left sided PTBD was done and an 8.3-F ring biliary catheter (Cook, Bloomington) was inserted for initial internal/external drainage. One week later, the external end of the catheter was capped to allow internal drainage of bile. After two weeks, the patient presented to the emergency department with short history of blood leaking from the sides of catheter. On examination, the patient's blood pressure was 100/76 mmHg, pulse was 112/min and respiratory rate was 12/min. His liver function tests showed total bilirubin of 4.6 mg/dL, serum albumin of 1.5 g/dL, alkaline phosphatase of 350 IU, aspartate transaminase of 147 IU, alanine transaminase of 47 IU, prothrombin time was 22 s (control: 11 s) and platelet count was 88,000/ μ L. The patient was given two units of blood. The patient was referred to interventional radiology for further management.

Cholangiogram was done through the ring biliary catheter to look for the source of hemorrhage. It showed communication of the left hepatic duct with left branch

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Abbreviations: CT: computed tomography; IU: international units; PTBD: percutaneous transhepatic biliary drainage
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Figure 1 Cholangiograms performed through ring biliary catheter in antero-posterior (A) and lateral (B) views in subtraction mode showing opacification of entire portal venous system (short white arrows) with possible site of bilio-venous fistulous communication (long black arrow).

of portal vein (Figure 1). The study also showed blocked left secondary biliary confluence due to tumor progression. Since the patient was in shock, immediate intervention was planned. A covered stent of size 10 mm × 100 mm—Fluency Plus (Bard, Covington, Georgia) was inserted through the catheter to cover the rent between the left hepatic duct and portal vein (Figure 2A). Subsequent cholangiogram showed complete occlusion of the fistula (Figure 2B). The ring biliary catheter was inserted through the stent to allow drainage of segment 2 and 3 ducts and to maintain access for future interventions. The patient's vital parameters improved and his blood pressure reached 124/78 the next day. Clear bile was seen draining externally from the catheter after 24 h. The patient developed mild cholangitis subsequently, which was managed by antibiotics. Ultrasonography done three days later showed mass in the right lobe of liver without any dilatation of intrahepatic bile

ducts. The patient was discharged two weeks later in stable condition.

DISCUSSION

Hemobilia, occurring after PTBD has various causes including bleeding from tumor, deranged coagulation parameters and rarely communication with hepatic artery or portal vein and pseudoaneurysm.^{6,7} In patients with biliary malignancy, biliovenous fistula may develop as a result of catheter or biliary stent eroding into the portal vein or by tumor invasion.¹⁰ When there is such vascular communication, radiological intervention becomes necessary. The type of intervention depends on the severity of hemorrhage.⁹

For minor hemorrhage due to bilio-venous fistula, where patient is hemodynamically stable, we often close

Figure 2 (A) Placement of stent graft (arrows) across the bilio-venous fistulous site. (B) Cholangiogram in subtraction mode performed after stenting showing complete block of the fistula.

the external end of the internal/external drainage catheter to create a tamponade effect and this controls the hemorrhage as portal vein is a low pressure system. Increasing the size of the catheter may also help.⁸ Similarly, temporary balloon occlusion is also useful in controlling the bleeding.⁸ In cases of larger fistula with severe bleeding causing hemodynamic instability, immediate closure of the fistulous communication becomes necessary.^{9,11} The cause of fistula in such a situation is difficult to identify as it can result from either tumor invasion or catheter erosion into the vein or both. A contrast enhanced CT scan may be performed to identify the exact cause.⁹ However, in both the cases, management will be same.

The options for treating such a fistula include stent graft placement in the bile duct/hepatic duct or in the branch of portal vein, coil embolization of fistula and portal vein embolization.¹⁰ All these three options were discussed in our case. Portal vein stenting and portal vein embolization would need gaining access to the vein and placing the stent, which would delay hemostasis. Further, there is a risk of liver infarct with portal vein embolization as the status of left hepatic artery was not known.¹⁰ Coil embolization of the fistulous tract was difficult as the fistula was very short in length and not well localized. Since the patient had deranged coagulation parameters and the communication with the left portal vein was closer to the bifurcation, biliary stent placement was decided as the optimal treatment. The stent graft should be placed in such a way that there is a margin of 1–2 cm on either side of the fistulous communication. The risks of covered stent placement in biliary system include isolation of other non-drained ducts, which may cause cholangitis, occlusion of pancreatic duct which may cause pancreatitis and stent migration.^{10,13} In our patient, the PTBD catheter was draining only ducts of segments 2 and 3 as the disease had already involved primary and bilobar secondary biliary confluence and hence there was no increase in risk of ductal isolation. This was confirmed by doing ultrasonography 3 days after stent placement. Our patient did not develop pancreatitis.

In conclusion, biliovenous fistula is a very rare complication of PTBD and most may settle by conservative management. In cases of severe hemobilia due to the fistula,

placement of stent graft in the biliary system is an effective treatment option.

CONFLICTS OF INTEREST

The authors have none to declare.

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