

5

■ E R C P ■

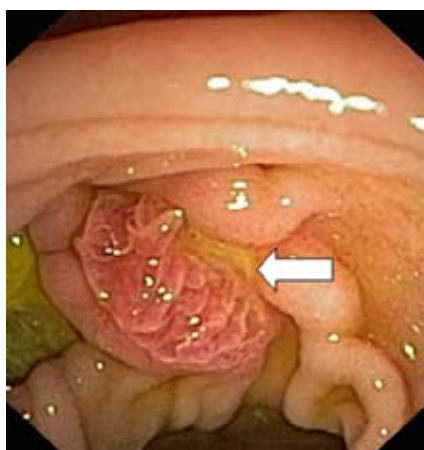
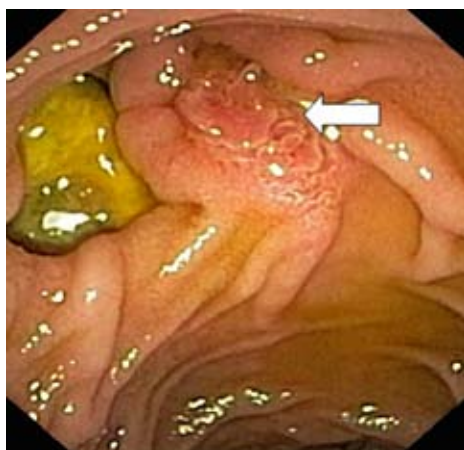
ERCP

Case 1

Chatchai Kriengkirakul, MD.

Rungsun Rerknimitr, MD.

A 76-year-old male, previously diagnosed with acute cholangitis from CBD stone. ERCP (standard sphincterotomy with balloon extraction) was done. Four hours later, post ERCP procedure, he developed an angina chest pain. Cardiologist gave him heparin and aspirin. Later, he presented with melena. EGD with side-view duodenoscopy was done as shown.



In this case, endoscopy showed post sphincterotomy ulcer without active bleeding (white arrow) and a periampullary diverticulum containing food residue.

Diagnosis:

Ampullary ulcer (from post sphincterotomy) without active bleeding.

Discussion:

Post sphincterotomy bleeding occurs infrequently (2.1%) but carries a significant impact on the morbidity of the patient¹. Avoiding the use of anticoagulant and antiplatelet agents are the standard practice to reduce the risk for bleeding. The new micro-processor controlled electrosurgical unit has been proven as a tool for further reduction of the bleeding rate². However, the unavoidable bleeding is still easily controlled by just diluted epinephrine injection, unlike non-variceal bleeding ulcer, the typical post-sphincterotomy bleeding cases are rarely require other advanced endoscopic modes of therapy³. Nevertheless, the endoscopist still

needs to familiar with the side-viewing endoscope since the feeling of using the accessories through the channel may be somewhat different from the standard end-viewing scope.

References

1. Pungpapong S, Kongkam P, Rerknimitr R, Kullavanijaya P. Experience on endoscopic retrograde cholangiopancreatography at tertiary referral center in Thailand: risks and complications. J Med Assoc Thai 2005;88:238-46.
2. Perini RF, Sadurski R, Cotton PB, Patel RS, Hawes RH, Cunningham JT. Post-sphincterotomy bleeding after the introduction of microprocessor-controlled electrosurgery: does the new technology make the difference? Gastrointest Endosc 2005;61:53-7.
3. Ferreira LE, Baron TH. Post-sphincterotomy bleeding: who, what, when, and how. Am J Gastroenterol 2007; 102:2850-8.

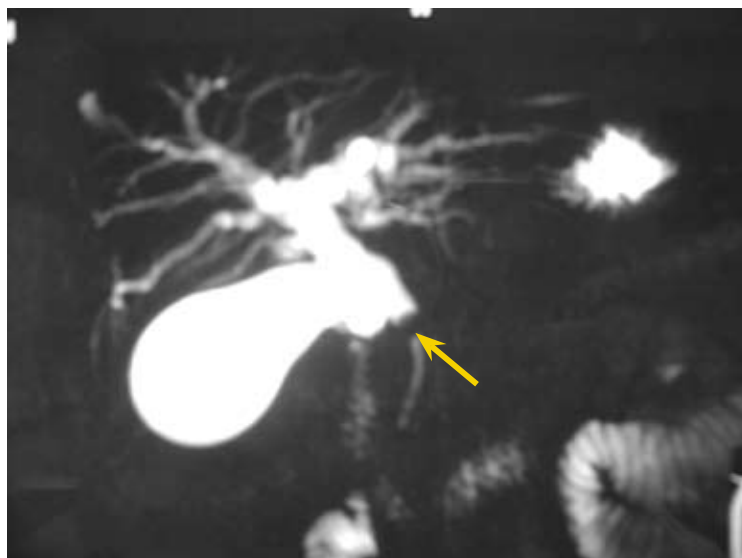


Case 2

Rapat Pittayanon, MD.

Rungsun Rerknimitr, MD.

A 29-year-old Thai woman suffered from obstructive jaundice for one month. No fever or weight loss was detected. Liver function test showed markedly elevated serum bilirubin (24.8 mg/dl). Magnetic resonance cholangiopancreatography (MRCP) revealed round radiolucent filling defect (green arrow), most likely representing a stone situated at the junction of cystic duct and mid-part of common bile duct and this stone caused proximal upstream ducts dilation including gallbladder, common bile duct and intrahepatic duct. In addition, a relatively narrow downstream common bile duct was noted and this represented the original size of common bile duct.



Diagnosis:

Type 1 Mirizzi syndrome.

Discussion:

Mirizzi syndrome type 1 regards the external compression of the common bile duct from any causes¹. Magnetic resonance cholangiopancreatography (MRCP) provides a noninvasive alternative test to endoscopic retrograde cholangiopancreatography (ERCP) for the diagnosis of Mirizzi syndrome, as well as, a simple pictorial display than other non invasive techniques such as CT scan and ultrasonography². However, in certain situations, ERCP can be a definitive treatment for Mirizzi's syndrome type 1 especially for unsuitable surgical candidates³.

References

1. Csendes A, Diaz JC, Burdiles P, Maluenda F, Nava O. Mirizzi syndrome and cholecystobiliary fistula: A unifying classification. Br J Surg 1989;76: 1139-43.
2. Becker CD, Grossholz M, Mentha G, de Peyer R, Terrier F. MR cholangiopancreatography: technique, potential indications, and diagnostic features of benign, postoperative, and malignant conditions. Eur Radiol 1997;7:865-74.
3. England RE, Martin DF. Endoscopic management of Mirizzi's syndrome. Gut 1997;40:272-6.



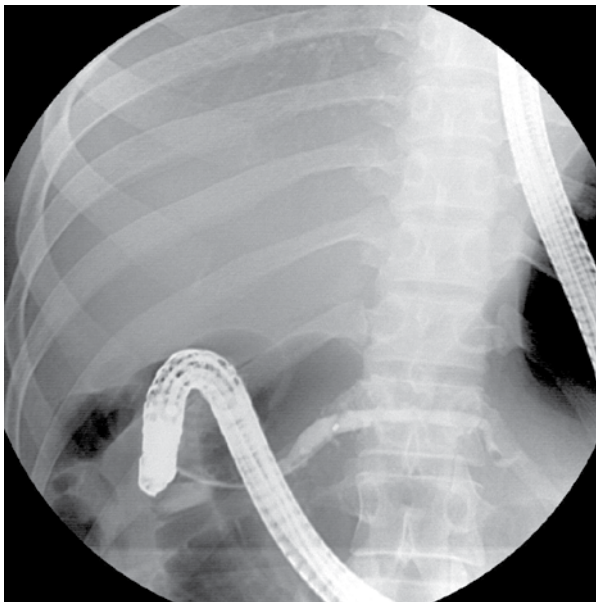
Case 3

Wiriyaporn Ridditid, MD.

Rungsun Rerknimitr, MD.

A 25-year-old woman with known underlying of pancreas divisum presented with recurrent acute pancreatitis for many times. A history of plastic stent insertion in pancreatic duct via minor papilla was documented 3 years ago and her symptom had been resolved temporary.

A repeat endoscopic retrograde cholangiopancreatography (ERCP) was done as shown.

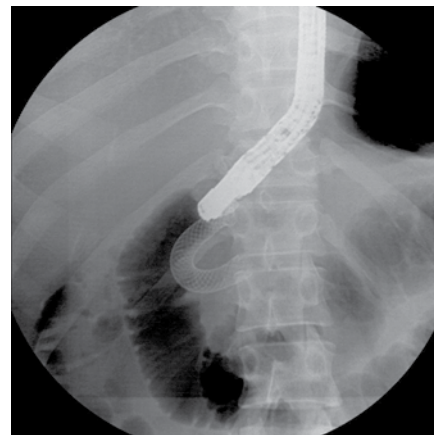
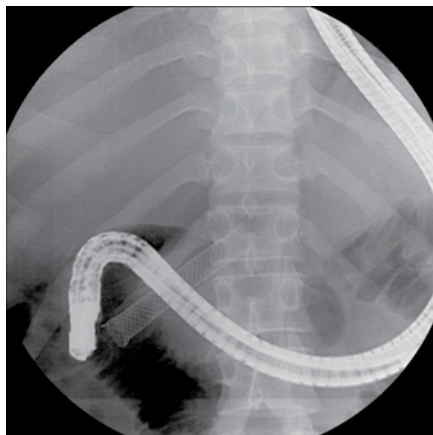




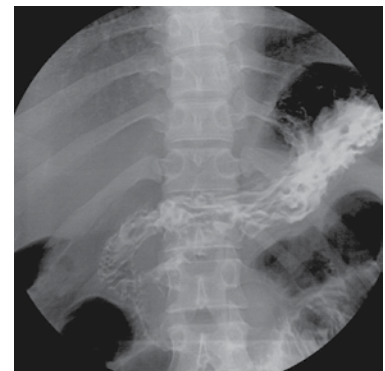
Pancreatogram via minor papilla revealed narrow proximal part of the dorsal pancreatic duct with upstream dilatation.

The diagnosis was pancreas divisum with chronic pancreatitis.

A fully covered self-expandable metallic stent (SEMS) (Wallflex, Boston Scientific, MA)) was placed in the dorsal pancreatic duct via minor papilla as shown.



Her symptom improved without complications. Three months later, a successful SEMS removal was performed as shown.



After stent removal, pancreatogram via minor papilla showed the improvement of dorsal pancreatic duct narrowing. The contrast in the pancreatic duct could easily drained into duodenum via minor papilla. She reported no more recurrent pancreatitis since.

Discussion:

Generally, endoscopic therapy with stenting in the dorsal pancreatic duct is an effective treatment for patients with pancreas divisum and chronic pancreatitis¹⁻³. Plastic stent insertion was performed in the previous studies. Recently, the series of three cases with chronic pancreatitis and pancreas divisum successfully treated with endoscopic placement of a covered SEMS in the minor papilla (Taewoong Medical Co., Seoul, South Korea)⁴ were reported. Interestingly, all three SEMS had passed spontaneously within 6 months after stent placement.

References

1. Fogel EL, Toth TG, Lehman GA, et al. Does endoscopic therapy favorable affect the outcome of patients who have recurrent acute pancreatitis and pancreatic divisum? *Pancreas* 2007;34: 21-45.
2. Vitale GC, Vitale M, Vitale DS, et al. Long-term follow-up of endoscopic stenting in patients with chronic pancreatitis secondary to pancreas divisum. *Surg Endosc* 2007;21:2199-202.
3. Liao Z, Gao R, Wang W, et al. A systemic review on endoscopic detection rate, endotherapy, and surgery for pancreas divisum. *Endoscopy* 2009;41:439-44.
4. Liao Z, Li ZS, Wang W, et al. Endoscopic placement of a covered self-expandable metal stent in the minor papilla in patients with chronic pancreatitis and pancreas divisum. *Endoscopy* 2009; 41 Suppl 2:E302-3. Epub 2009 Nov 17.

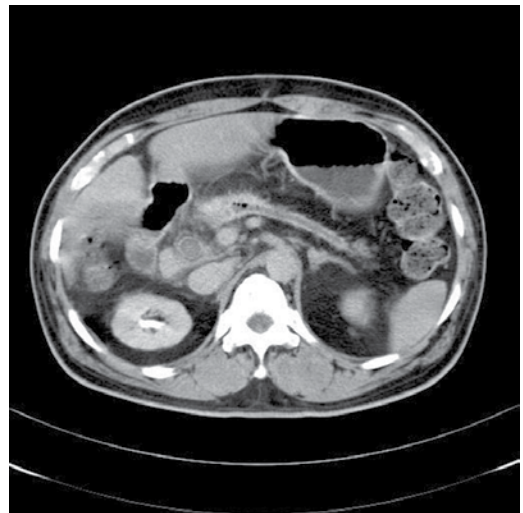
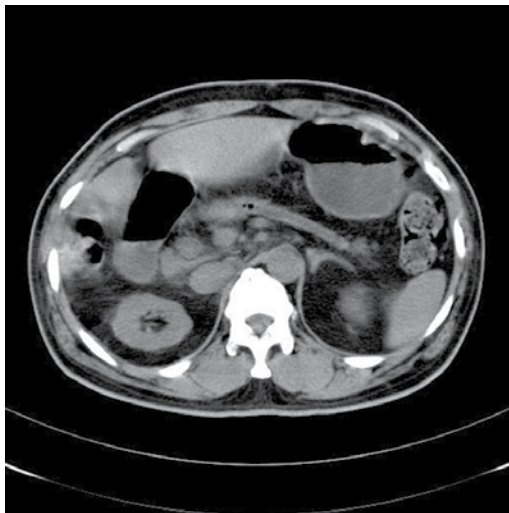


Case 4

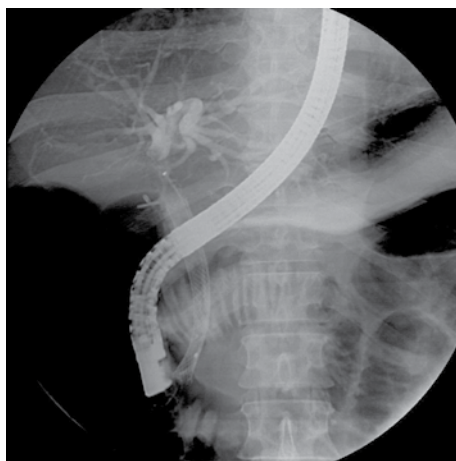
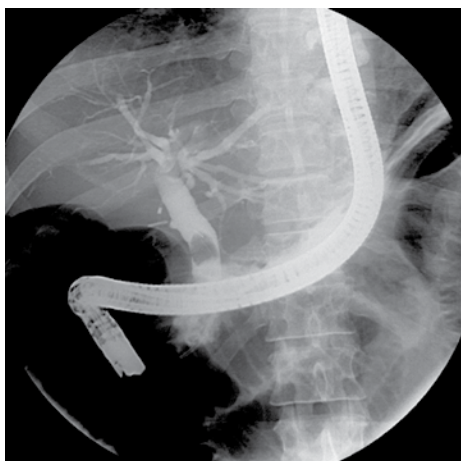
Wiriyaporn Ridditid, MD.

Rungsun Rerknimitr, MD.

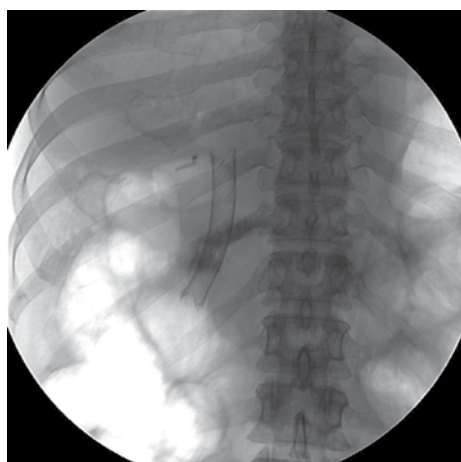
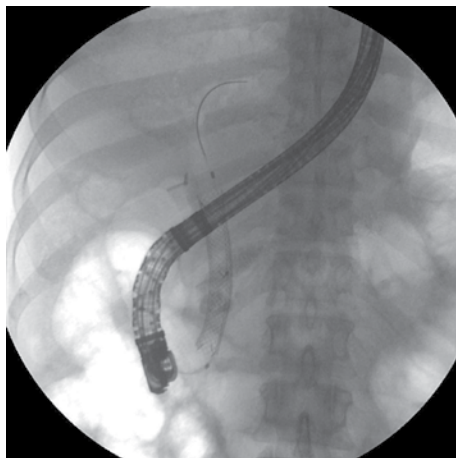
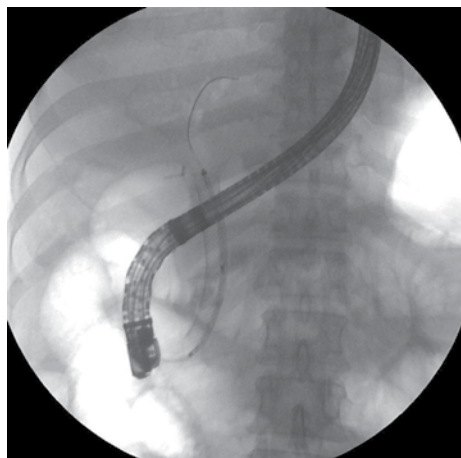
A 58-year-old man was scheduled for an endoscopic retrograde cholangiopancreatography (ERCP) with stent removal. Last year he presented with acute cholangitis. CT scan of the abdomen and ERCP showed chronic pancreatitis with distal biliary stricture and CBD stones as shown. Stone extraction by a balloon followed by an Partially covered self-expandable metallic stent (SEMS) (Wallstent) placement was successfully performed. His symptom resolved thereafter.

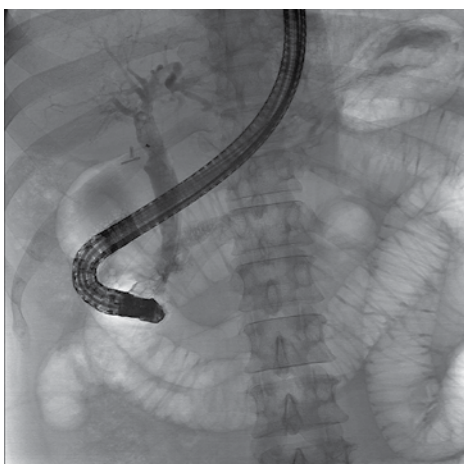
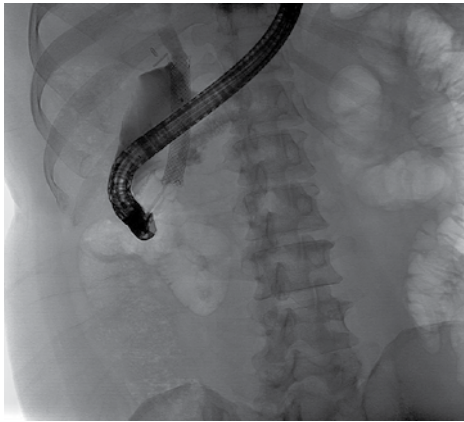


A



The elective ERCP was performed and multiple attempts of SEMS removal with a snare and rat-tooth forceps were unsuccessful. Then, a fully covered SEMS (Taewoong Medical Co., Seoul, South Korea) was inserted as a second stent to decrease the endoluminal tissue hyperplasia as shown.





Two months later, he was re-scheduled for an elective ERCP for stent removal. This time, ERCP and stent removals of both SEMS was successfully performed as shown without complications. After contrast injection, resolution of biliary stricture was seen.

Discussion:

Benign biliary strictures can be endoscopically managed by stenting. Plastic stents have been associated with multiple stent exchanges. Uncovered SEMS have been related to the endoluminal tissue hyperplasia. Partially covered SEMS have been linked to migration. Recently, there was a report of successful temporary placement of fully covered SEMS in those patients¹. In contrast to uncovered SEMS, covered SEMS removals could be easily performed by using a rat-tooth forcep or snare². In terms of unsuccessful stent removal, there were a few reports of alternative methods with stent extraction such as second covered SEMS placement to decrease mucosal hyperplasia, piecemeal extraction, and using a suture-cutting device³⁻⁵.

References

1. Mahajan A, Ho H, Sauer B, et al. Temporary placement of fully covered self-expandable metal stents in benign biliary strictures: midterm evaluation (with video). *Gastrointest Endosc* 2009;70:303-9.
2. Shin HP, Kim MH, Jung SW, et al. Endoscopic removal of biliary self-expandable metallic stents: a prospective study. *Endoscopy* 2006;38:1250-5.
3. Lahlal M, Gigot JF, Annet L, et al. Successful endoscopic extraction of a double uncovered expandable metal stent. *Endoscopy* 2009;41:E98-9.
4. Egan LJ, Baron TH. Endoscopic removal of an embedded biliary Wallstent by piecemeal extraction. *Endoscopy* 2000;32:492-4.
5. Levy MJ, Wiersema MJ. Endoscopic removal of a biliary Wallstent with a suture-cutting device in a patient with primary pancreatic lymphoma. *Endoscopy* 2002;34:835-7.



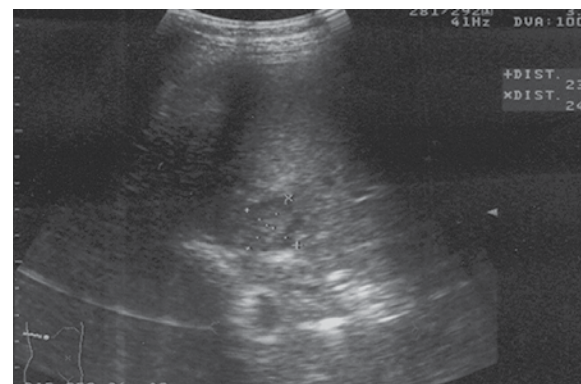
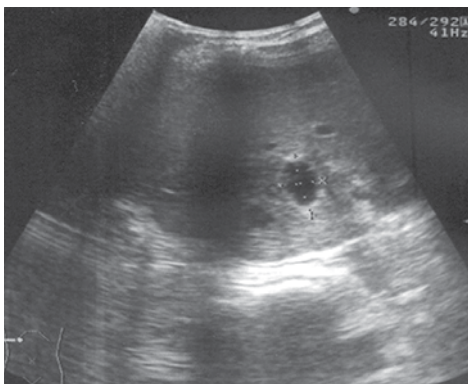
Case 5

Wiriyaporn Ridditid, MD.
Rungsun Rerknimitr, MD.



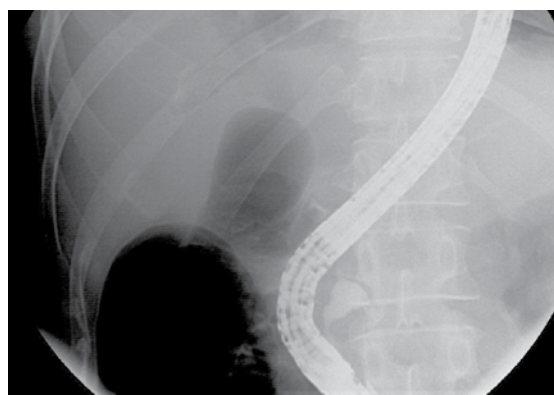
A 51-year-old woman presented with fever and right upper quadrant pain for 2 weeks. She had a history of biliary-enteric surgery 40 years ago. Liver function tests showed TB 2.8 mg/dL, DB 1.7 mg/dL, AST 114 IU/L, ALT 106 IU/L and ALP 388 IU/L.

Plain abdomen and upper abdominal ultrasonography were performed as shown.



Plain abdomen revealed aerobilia. Ultrasonography of the abdomen showed multiple well-defined anechoic lesions in the posterior segment of right hepatic lobe (segment VI and VII) with the size ranged from 1.1x0.6 cm. to 2.4x1.6 cm. A round isoechoic lesion with surrounding hypoechoic rim in the same area of those aforementioned lesions was measured about 2.3x2.4 cm.

Endoscopic retrograde cholangiopancreatography (ERCP) was done as shown.



ERCP demonstrated remnant cystic portion of the common bile duct with long common channel. Pancreatogram via major papilla was normal.

The diagnosis was infected remnant choledochal cyst and liver abscess. After antibiotics administration, her symptom resolved.

Discussion:

Ascending cholangitis is a late complication after surgical excision with biliary-enteric anastomosis in patients with history of choledochal cyst. Other late complications are pancreatitis, stones, and cholangiocarcinoma¹. About 77% of patients with previous cyst-

enterostomy, the bile was infected at the time of secondary cyst excision. It suggested that enteric anastomosis caused bacterial infection of the bile in the remnant of choledochal cyst².

References

1. Saing H, Han H, Chan KL, et al. Early and late results of excisions of choledochal cysts. J Pediatr Surg 1997;32:1563-6.
2. Kaneko K, Ando H, Seo T, et al. Bile infection contributes to intrahepatic calculi formation after excision of choledochal cysts. Pediatr Surg Int 2005;21:8-11.



Case 6

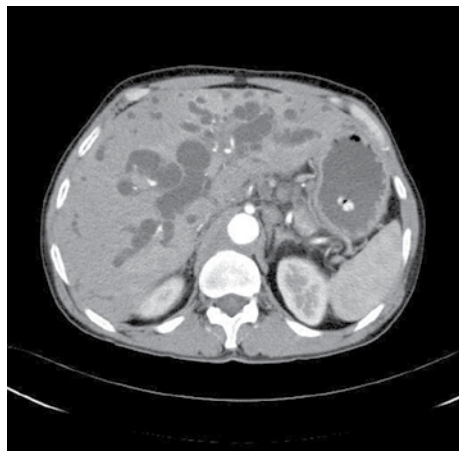
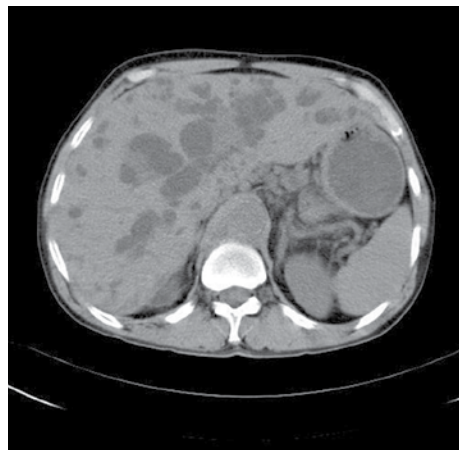
Wiriyaporn Ridditid, MD.

Akkawat Janchai, MD.

Rungsun Rerknimkitr, MD.

A 62-year-old man, presented with progressive jaundice and weight loss for 2 months.

CT scan of the abdomen was performed as shown.

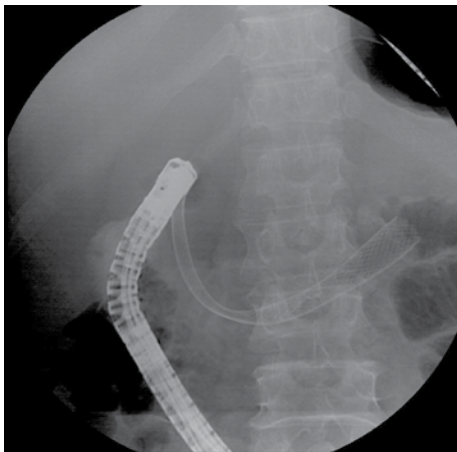


A

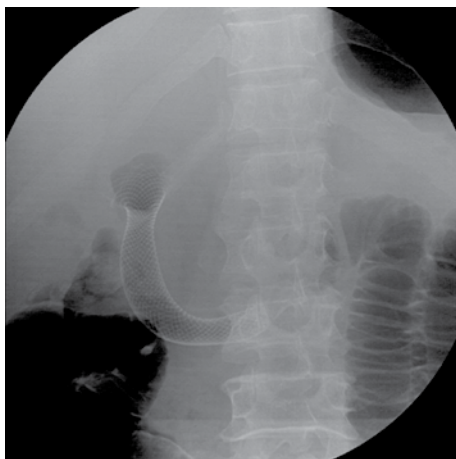
CT scan revealed a common bile duct with bilateral intrahepatic bile ducts dilatation. Pancreatic head mass with upstream pancreatic duct dilatation was seen.

The diagnosis was **pancreatic head cancer**.

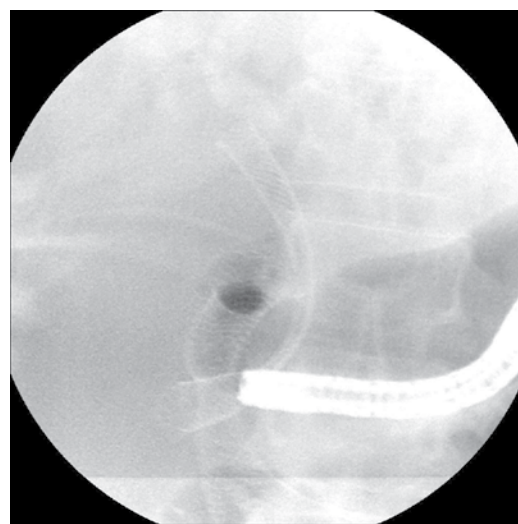
Endoscopic retrograde cholangiopancreatography (ERCP) was scheduled for biliary decompression by inserting a self-expandable metallic stent (SEMS). Endoscopic finding demonstrated narrow lumen of duodenum and a duodenoscope could not pass through the duodenal lumen due to tumor invasion. Then, duodenal stent (enteral Wallstent) was placed as shown. However, the duodenal stent obscured the viewing of the biliary orifice completely.



Therefore, uncovered biliary SEMS (Wallstent) was inserted by a Rendezvous technique as shown.



(Noted cholangiogram via percutaneous route was obtained)



Discussion:

Combined biliary and enteral SEMS insertions for malignant biliary and duodenal obstruction provide an alternative treatment for palliation in patients with unresectable pancreatic cancer. The clinical outcome is acceptable. Both of the procedures can be simultaneously performed by either endoscopic insertion or percutaneous placement¹⁻³. However, endoscopic stenting for combined malignant biliary and duodenal obstruction is recognized as a difficult technique since an endoscopic biliary SEMS insertion through the duodenal stent can be unsuccessful in 6-13%^{1,3}.

References

1. Kaw M, Singh S, Gagneja H. Clinical outcome of simultaneous self-expandable metal stents for palliation of malignant biliary and duodenal obstruction. *Surg Endosc* 2003;17:457-61.
2. Akinci D, Akhan O, Ozkan F, et al. Palliation of malignant biliary and duodenal obstruction with combined metallic stenting. *Cardiovasc Intervent Radiol* 2007;30:1173-7.
3. Moon JH, Choi HJ, Ko BM, et al. Combined endoscopic stent-in-stent placement for malignant biliary and duodenal obstruction by using a new duodenal metal stent (with videos). *Gastrointest Endosc* 2009;70:772-7.



Case 7

Salyavit Chittmittraprap, MD.

Wiriyaporn Ridditid, MD.

Rungsun Rerknimitr, MD.

A 63-year-old man with hepatocellular carcinoma (HCC) associated with alcoholic cirrhosis was admitted to the hospital for his liver biopsy and forth transarterial chemoembolization (TACE) session. He underwent prior 3 TACE sessions uneventfully. A new lesion adjacent to previous lesion was recently identified by a follow-up computerized tomography (CT) scan. Then a percutaneous ultrasonography-guided liver biopsy was done just before the 4th TACE session. One day after TACE, he developed fever with progressive jaundice. His bilirubin level rose from previous level of 1.0 to 7.9 mg/dL (<1 mg/dL) and continuously increased up to 21.9 mg/dL. Three days later, another CT scan showed a tiny hyperdensity spot obstructed distal common bile duct (CBD) with upstream dilated CBD and intrahepatic bile ducts. Distal CBD area demonstrated a target shape containing high density as lipiodol density found in the liver. This indicated biliary fistula from (Figure 1) post liver biopsy. Similar lesion was detected in the intestinal lumen as well (Figure 2). Those findings supported that biliary fistula developed secondary from percutaneous liver biopsy and caused bleeding into duodenum before causing biliary obstruction. Endoscopic treatment with standard sphincterotomy and balloon extraction revealed multiple old blood clots from CBD (Figure 3). Subsequently, bilirubin level decreased and his general condition improved. One month after ERCP and CT scan demonstrated aerobilia due to previous sphincterotomy, and that hyperdensity spot disappeared (Figure 4).

Diagnosis:

Post percutaneous liver biopsy induced biliary fistula with hemobilia and migration of lipiodol stain

Discussion:

New onset of jaundice in the setting of HCC portends bad prognosis and usually indicates poor liver reserve rather than biliary obstruction. Though there are treatable obstructive causes such as tumor growth within bile duct and tumor thrombus sloughing into bile duct¹. Biliary fistula is another rare complication of liver biopsy². Unfortunately, the precise diagnosis

cannot be entertained prior to an endoscopic retrograde cholangiopancreatography (ERCP)³ and the suspicion is only made based on the clinical ground of a new onset of cholangitis and the bleeding from duodenum. Generally, CT scan can only suggest the possibility of biliary fistula with hemobilia by showing an arterial filling tubular structure that located adjacent to the dilated biliary tree⁴ or evidence of aneurysm of the celiac trunk or its branches⁵. In our patient, it is unique that Lipiodol from the previous TACE is an incidental trace for arteriobiliary fistula.

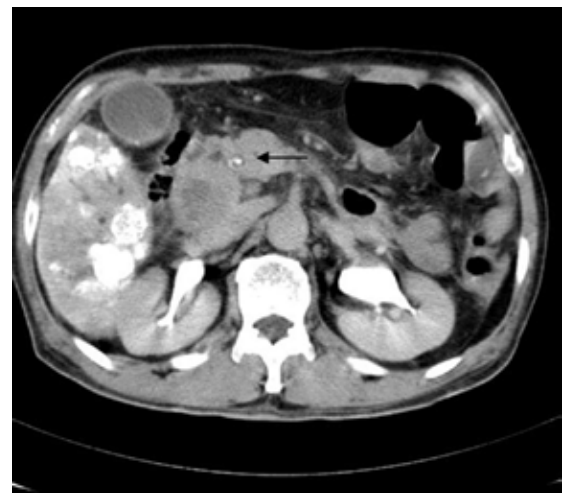


Figure 1 A tiny hyperdensity spot (black arrow) (lipiodol) obstructed distal common bile duct (CBD) with upstream dilated CBD and intrahepatic bile ducts.

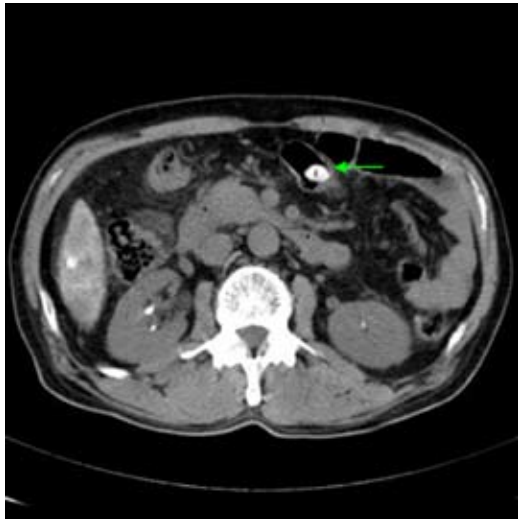


Figure 2 Pre contrast study CT scan demonstrating hyperdensity spot (green arrow) in the intestine.

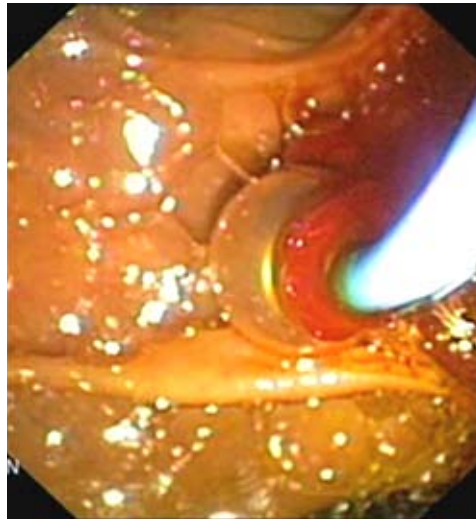
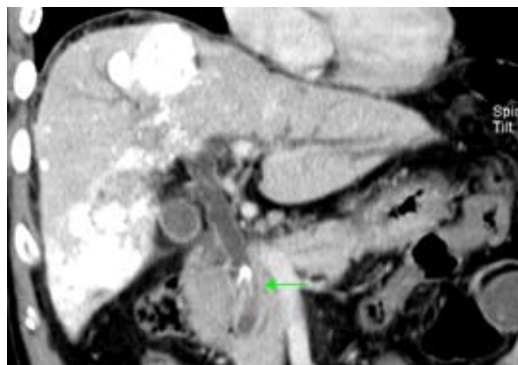


Figure 3 Demonstrating hemobilia during balloon sweeping of the CBD.



Figures 4 and 5 Showing pre and post lipiodol (green arrow) removal from CBD by ERCP. Of note, aerobilia (black arrow) occurred after a sphincterotomy.

References

1. Lun-Xiu Qin, Zhao-You Tang. Hepatocellular carcinoma with obstructive jaundice: diagnosis, treatment and prognosis. *World J Gastroenterol* 2003;9:385-91.
2. Rossi P SP, Gentileschi P, Sica GS, et al. Delayed symptomatic hemobilia after ultrasound-guided liver biopsy: a case report. *Hepatogastroenterology* 2002;49:1659-62.
3. Kroser J, Rothstein RD, Kochman ML. Endoscopic management of obstructive jaundice caused by hemobilia. *Gastrointest Endosc* 1996;44:618-9
4. Prata Martins F, Bonilha DR, Correia LP, et al. Obstructive jaundice caused by hemobilia after liver biopsy. *Endoscopy* 2008;40 Suppl 2:E265-6.
5. Traversa G, Zippi M, Bruni A, et al. A rare case of hemobilia associated with aneurysms of the celiac trunk, the hepatic artery, and the splenic artery. *Endoscopy* 2006;38 Suppl 2:E5-6.



Case 8

Phonthep Angsuwatcharakon, MD.

Pradermchai Kongkam, MD.

Rungsun Rerknimitr, MD.

A 45-year-old man with a history of rheumatic heart disease with post aortic replacement and cardiac cirrhosis was diagnosed with CBD stone by EUS and underwent ERCP with sphincterotomy and stone extraction. Ten days after ERCP, he developed acute anemia and passing melena. An end-view EGD was done.



Figures 1 and 2 Revealed post-sphincterotomy ulcer with active oozing from visible vessel (green arrow).

Hemostasis was achieved by a combination of adrenaline injection and argon plasma coaptation. Side-view duodenoscopy was performed on the next day to reassure the success hemostasis.

Diagnosis:

Post-sphincterotomy bleeding with visible vessel

Discussion:

Bleeding complication after endoscopic sphincterotomy can occur as immediate or delayed setting. The immediate bleeding is usually defined as the bleeding that observed during ERCP procedure, while the bleeding which occurs after that will be classified as delayed bleeding. The incidence of post sphincterotomy bleeding is reported between 4.2-10.3%^{1, 2}. The definite risk factors for post endoscopic sphincterotomy bleeding, which are significant by multivariate analysis in most studies, are coagulopathy; anticoagulant within 3



Figure 3 Reveals disappearance of the blood vessel on the sphincterotomy ulcer.

days of endoscopic sphincterotomy; cholangitis before ERCP; bleeding during initial endoscopic sphincterotomy; lower endoscopist ERCP case volume³. The associated factors, which are significant by univariate analysis in most studies, are cirrhosis; dilated CBD; periampullary diverticulum; precut sphincterotomy; and CBD stone³. Factors not significant by multivariate analysis in any study include aspirin or NSAID use, ampullary tumor, longer length of sphincterotomy, and extension of prior endoscopic sphincterotomy³. Most episodes of post sphincterotomy bleeding are spontaneously ceased. Therapeutic procedures are considered

References

in “endoscopically significant” immediate bleeding and “clinically significant” delayed bleeding⁴. Adrenaline injection at the apex of the sphincterotomy alone achieved hemostasis in majority of the cases (96-100%)⁴. One retrospective study compared adrenaline injection alone and combination with thermotherapy (bipolar, monopolar and APC) in post sphincterotomy bleeding showed initial hemostasis rates as 96.2% and 100%, rebleeding rates as 16% and 12.1%, requiring angiogramphic embolization rates as 11.5% and 3%⁵.

1. Kim HJ, Kim MH, Kim DI, et al. Endoscopic hemostasis in sphincterotomy-induced hemorrhage: its efficacy and safety. *Endoscopy* 1999;31:431-6.
2. Leung JW, Chan FK, Sung JJ, et al. Endoscopic sphincterotomy-induced hemorrhage: a study of risk factors and the role of epinephrine injection. *Gastrointest Endosc* 1995;42:550-4.
3. Freeman ML. Adverse outcomes of ERCP. *Gastrointest Endosc* 2002;56: S273-82.
4. Ferreira LE, Baron TH. Post-sphincterotomy bleeding: who, what, when, and how. *Am J Gastroenterol* 2007;102: 2850-8.
5. Tsou YK, Lin CH, Liu NJ, et al. Treating delayed endoscopic sphincterotomy-induced bleeding: epinephrine injection with or without thermotherapy. *World J Gastroenterol* 2009;15:4823-8.



Case 9

Phonthep Angsuwatcharakon, MD.

Rungsun Rerknimitr, MD.



A 68-year-old man, presented with postprandial right upper quadrant pain for several days, followed by shaking chills on the admission date. Physical examination revealed that he was febrile, had mildly jaundice with the complaint of mild tenderness at right upper quadrant. ERCP was done as shown.



The endoscopic pictures showed rounded, dark-green stone protruding from the ampulla of Vater. Needle knife was used to dissect the ampullary mucosa, then cholangiogram and balloon extraction of the stone were done. Finally, occluded-balloon cholangiogram revealed no more filling defect in the common bile duct.



Diagnosis:

Impacted common bile duct (CBD) stone.

Discussion:

The impacted CBD stone causes not only ascending cholangitis and pancreatitis but also in this situation it is difficult to perform a deep cannulation and standard papillotomy¹. Precut sphincterotomy with a needle knife has been reported to solve the failed standard cannulation in impacted CBD stone¹⁻³, the success rate of stone removal during the first ERCP session was

80%; 60% underwent precut followed by standard sphincterotomy and 20% underwent extended precut until the stone was expelled¹. However, 15% require another session of ERCP to remove the rest of stones because of bleeding in the first session, and 5% required surgery¹. Risk of injury to pancreatic duct in this situation was small because the pancreatic orifice was behind the stone and we can use stone as a cutting board to prevent injury to the pancreatic duct. Mild bleeding can occur as high as 20% in Leung's study, which may be related to edematous and congested papilla, but all were successfully controlled by endoscopic adrenaline injection¹.

References

1. Leung JW, Banez VP, Chung SC. Precut (needle knife) papillotomy for impacted common bile duct stone at the ampulla. *Am J Gastroenterol* 1990;85:991-3.
2. Binmoeller KF, Katon RM. Needle knife papillotomy for an impacted common bile duct stone during pregnancy. *Gastrointest Endosc* 1990; 36:607-9.
3. McAlister VC, Roy A, Passi RB. Harpoon extraction of a common bile duct stone impacted at the ampulla of Vater with needle-knife sphincterotome. *Gastrointest Endosc* 1993;39:111-2.



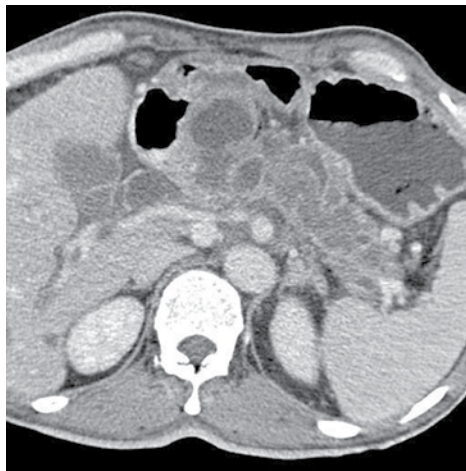
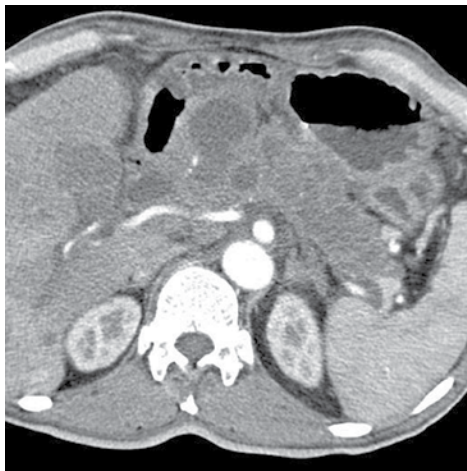
Case 10

Wiriyaporn Ridditid, MD.

Rungsun Rerknimitr, MD.

A 63-year-old man presented with progressive jaundice and weight loss for 2 months.

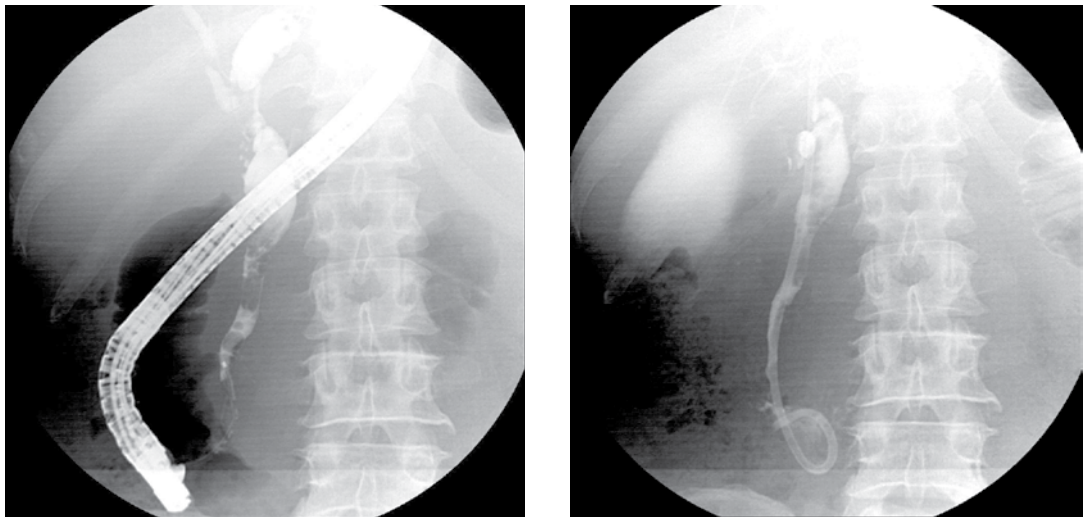
CT abdomen was performed as shown.



CT abdomen demonstrated solid-cystic lesion at pancreatic head with marked dilatation of the entire main duct with the presence of intraductal filling defects. Marked dilatation of proximal common bile duct was seen.

The differential diagnosis were intraductal papillary mucinous neoplasm (IPMN), mucinous cystic neoplasm (MCN), and ductal adenocarcinoma (DAC)

Endoscopic retrograde cholangiopancreatography (ERCP) was performed as shown.



Endoscopic finding revealed fish-eye appearance at ampulla. Endoscopic cholangiogram showed dilated biliary tree with distal and mid common bile duct containing amorphous filling defects. Balloon extraction revealed mucinous secretions. The diagnosis was IPMN with biliary obstruction. Plastic stent (double pigtail; 10 Fr 10 cm.) was placed in common bile duct. This patient was sent for a surgical evaluation later.

Discussion:

In patients with IPMN, biliary obstruction can occur. The pathogenesis of biliary obstruction can be explained by two reasons. First, direct extension of pancreatic cystic tumor into the bile duct wall resulting in biliary stricture is the most common factor. Second, the less common cause is mucin secreting tumor fistulizes into the bile duct and mucin accumulation results in distal biliary occlusion^{1, 2}. Generally, biliary drainage can be successful either by endoscopy or percutaneous drainage¹⁻³.

References

1. Sahani DV, Lin DJ, Venkatesan AM, et al. Multidisciplinary approach to diagnosis and management of intraductal papillary mucinous neoplasms of the pancreas. Clin Gastroenterol Hepatol 2009;7:259-69.
2. Belyaev O, Seelig MH, Muller CA, et al. Intraductal papillary mucinous neoplasms of the pancreas. J Clin Gastroenterol 2008;42:284-94.
3. Patel A, Lambiase L, Decarli A, et al. Management of the mucin filled bile duct. A complication of intraductal papillary mucinous tumor of the pancreas. JOP 2005;6:255-9.



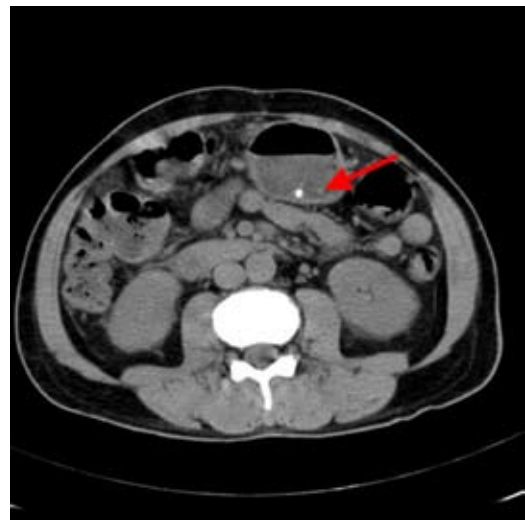
Case 11

Wiriyaporn Ridditid, MD.

Rungsun Rerknimitr, MD.

A 63-year-old man with history of chronic hepatitis B infection and hepatocellular carcinoma (HCC) presented with severe right upper quadrant pain with jaundice and fever at 3 weeks after transarterial chemoembolization (TACE).

CT scan of the abdomen was performed as shown.



A



CT scan of the abdomen demonstrated intraluminal Lipiodol-like material at the distal CBD with complete CBD obstruction measured about 1.1x0.8 cm., a few of lipiodol fragments were found in duodenal bulb, (red arrow) and gallbladder appeared distended.

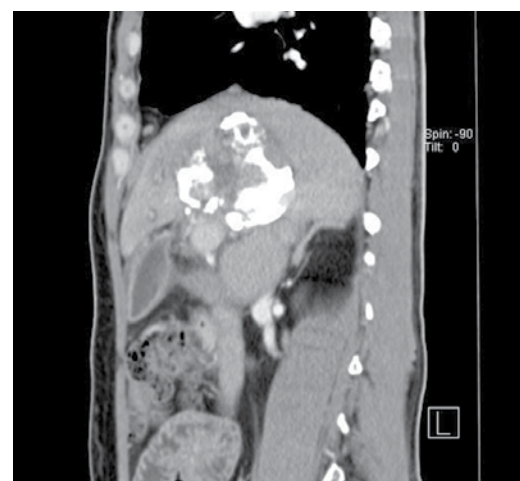
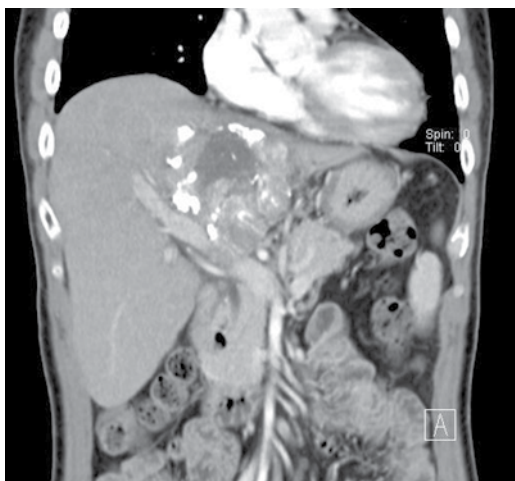
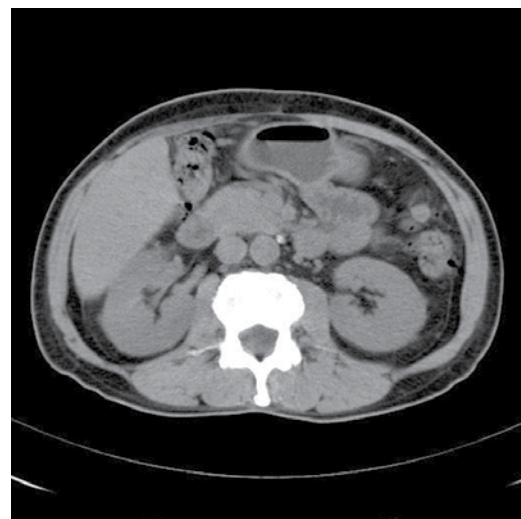
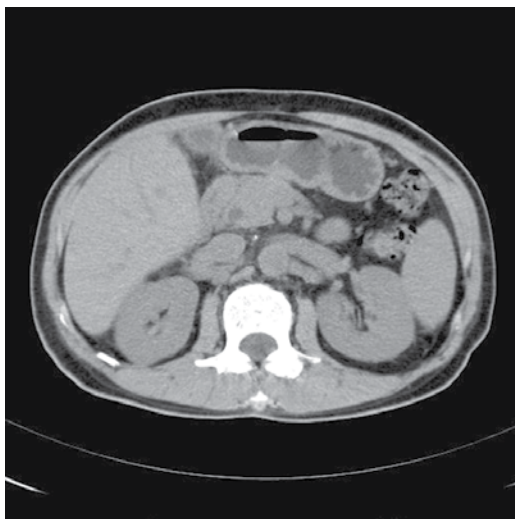
Endoscopic retrograde cholangiopancreato-graphy (ERCP) was done after 48 hours of the CT scan.



ERCP showed normal cholangiogram without filling defect. Lipiodal stain from TACE was also seen in the left lobe of liver.

The diagnosis was acute cholangitis resulting from necrotizing tumor or lipiodal fragment causing distal biliary obstruction.

Subsequently, the patient's symptoms were gradually improved. CT abdomen was repeated for a diagnostic confirmation. Lipiodal stain disappeared from distal common bile duct and duodenum as shown.



Discussion:

The most common side effects of TACE are transient fever and pain around 1-2 weeks after the procedure. Less common complications include hepatic infarction, liver abscess, and biloma. However, acute cholangitis owing to necrotizing tumor or lipiodal fragment after TACE is very rare¹⁻³.

References

1. Hiraki T, Sakurai J, Gobara H, et al. Sloughing of intraductal tumor thrombus of hepatocellular carcinoma after transcatheter chemoembolization causing obstructive jaundice and acute pancreatitis. *J Vasc Interv Radiol* 2006; 17:583-5.
2. Okuda M, Miyayama S, Yamashiro M, et al. Sloughing of intraductal tumor thrombus of hepatocellular carcinoma after transcatheter arterial chemoembolization. *Cardiovasc Intervent Radiol* 2009. [Epub ahead of print]
3. Choi KH, Cho YK, An JK, et al. Acute obstructive cholangitis after transarterial chemoembolization: the effect of percutaneous tranhepatic removal of tumor fragment. *Korean J Radiol* 2009;10:197-201.

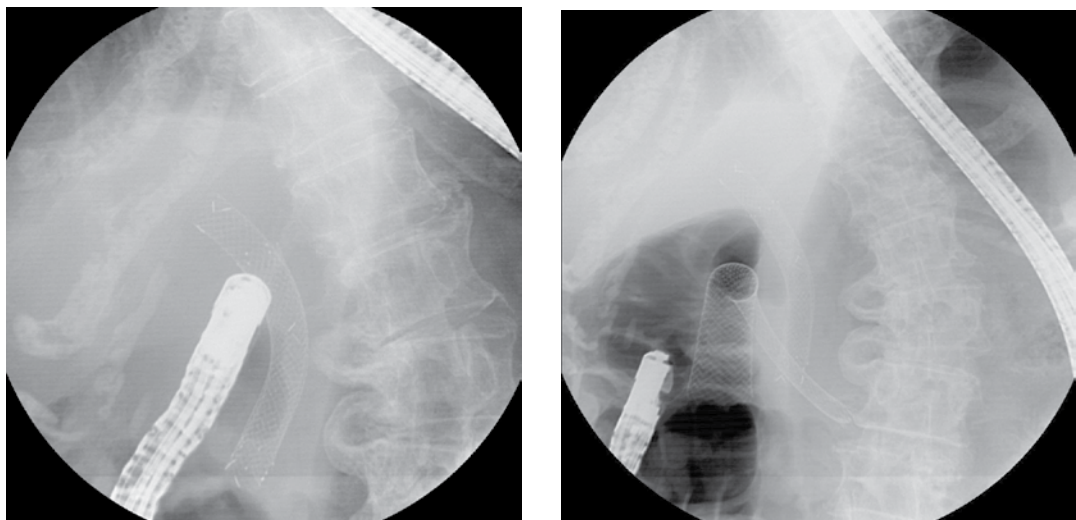


Case 12

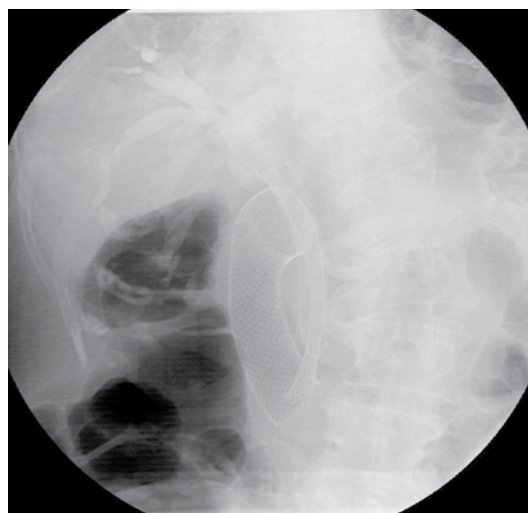
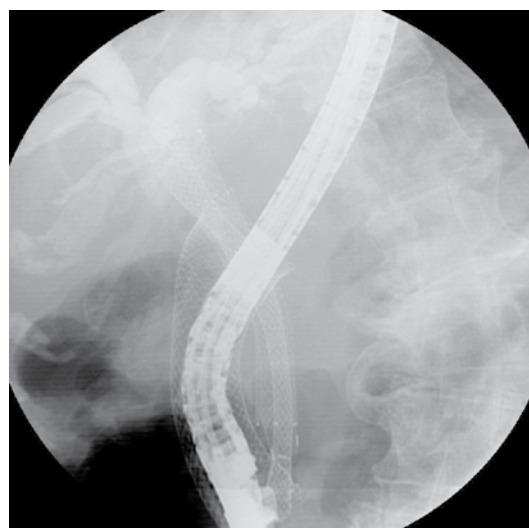
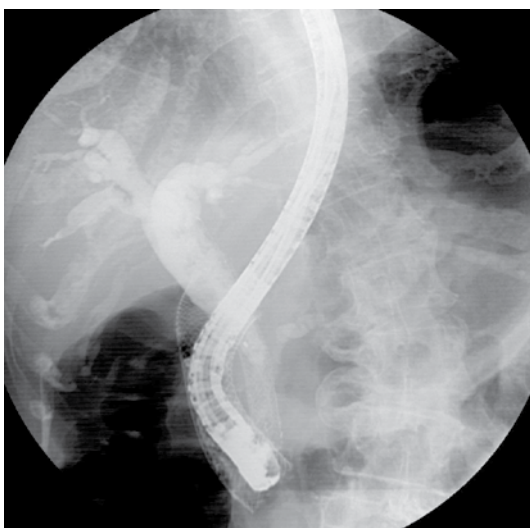
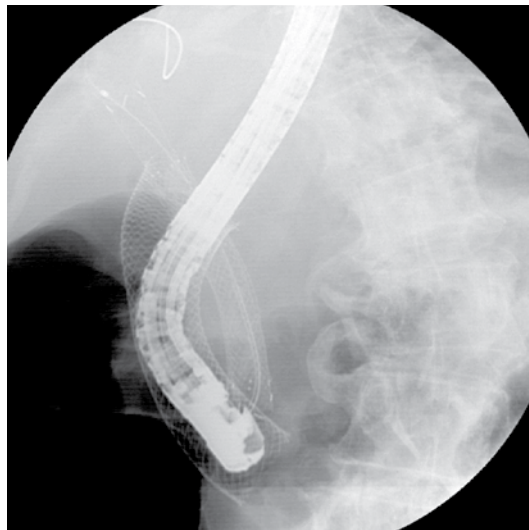
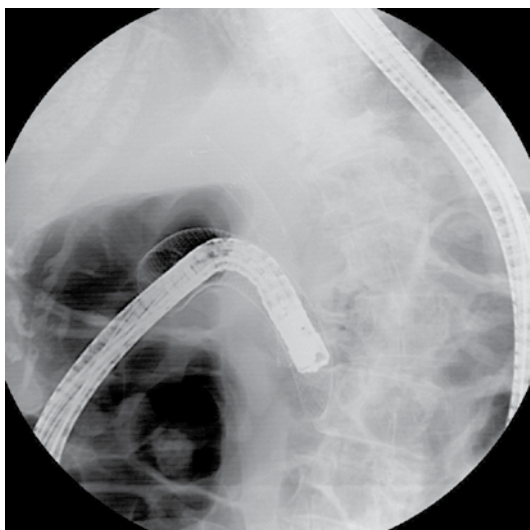
Wiriyaporn Ridditid, MD.
Rungsun Rerknimitr, MD.

A 70-year-old woman with a history of unresectable pancreatic cancer and post endoscopic biliary metallic stent insertion presented with progressive jaundice and fever for 2 weeks.

Endoscopic retrograde cholangiopancreatography (ERCP) was performed. Unfortunately, the duodenoscope cannot pass through duodenal lumen due to tumor invasion. Therefore, duodenal stent (9 cm.) was placed as shown.



After the duodenal stent placement, the mesh of the stent completely covered the biliary orifice. Endoscopic argon plasma trimming of the duodenal stent was done to allow the insertion of a biliary stent by using ERBE with flexible probes. The power was set at 70 watt. After that, the cholangiogram was successfully performed and showed tumor ingrowth within the previous biliary stent as shown. The new self expandable metallic stent (SEMS) was placed as a second stent.



Discussion:

To date, self-expandable metallic stent (SEMS) are widely accepted to be the treatment of choice for palliation in patients with unresectable malignant obstruction of the digestive tract. However, there are many complications of these prostheses such as stent occlusion, migration, pain, bleeding, and ulceration of the wall opposite to the prosthesis. Recently, argon trimming of metallic stents was reported as an efficient endoscopic procedure, allowing for an alternative correction of those complications^{1, 2}. In the previous data, ERBE (Elektromedizin GmbH, Tübingen, Germany, and ConMed, Utica, New York, USA) with flexible probe and 70-80 watt of the power setting were used. The end of the probe was positioned close to the stent. However, it should be kept as far as possible from the gastrointestinal wall in order to prevent mucosal damage during trimming.

References

1. Vanbiervliet G, Piche T, Caroli-Bosc FX, et al. Endoscopic argon plasma trimming of biliary and gastrointestinal metallic stents. *Endoscopy* 2005;37:434-8.
2. Christiaens P, Decock S, Buchel O, et al. Endoscopic trimming of metallic stents with the use of argon plasma. *Gastrointest Endosc* 2008;67:369-71.



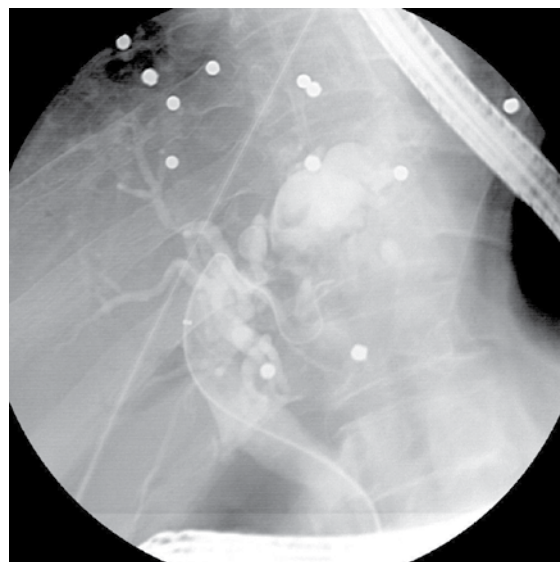
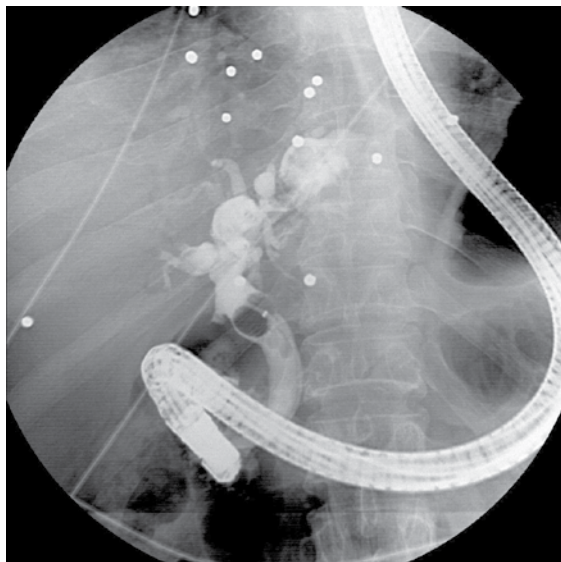
Case 13

Wiriyaporn Ridditid, MD.

Rungsun Rerknimitr, MD.

A 51-year-old man presented with right upper quadrant pain and fever for 3 days. Abdominal ultrasonography revealed mild common bile duct dilatation and marked left intrahepatic duct dilatation.

Endoscopic retrograde cholangiopancreatography (ERCP) was performed as shown.



ERCP demonstrated multiple filling defects in left intrahepatic duct which were distal to the short segment of the biliary stricture. The guidewire could not pass through the stricture.

The diagnosis was **left intrahepatic duct stricture with stones**.

Discussion:

It is known that intrahepatic biliary stones challenged the endoscopist as a difficult therapeutic procedure especially if the bile ducts are abnormal (stricture or dilatation). The primary goals of treatment are to get rid of recurrent cholangitis and to stop the progression of the disease which leads to intrahepatic cholangiocarcinoma¹. Surgery has a primary role in hepatolithiasis because multiple sessions of the endoscopic treatment are often required due to recurrent stones².

References

1. Mori T, Sugiyama M, Atomi Y. Management of intrahepatic stones. Best Practice & Research Clin Gastroenterol 2006;20:1117-37.
2. Cheon YK, Cho YD, Moon JH, et al. Evaluation of long-term results and recurrent factors after operative and nonoperative treatment for hepatolithiasis. Surgery 2009;146:843-53.



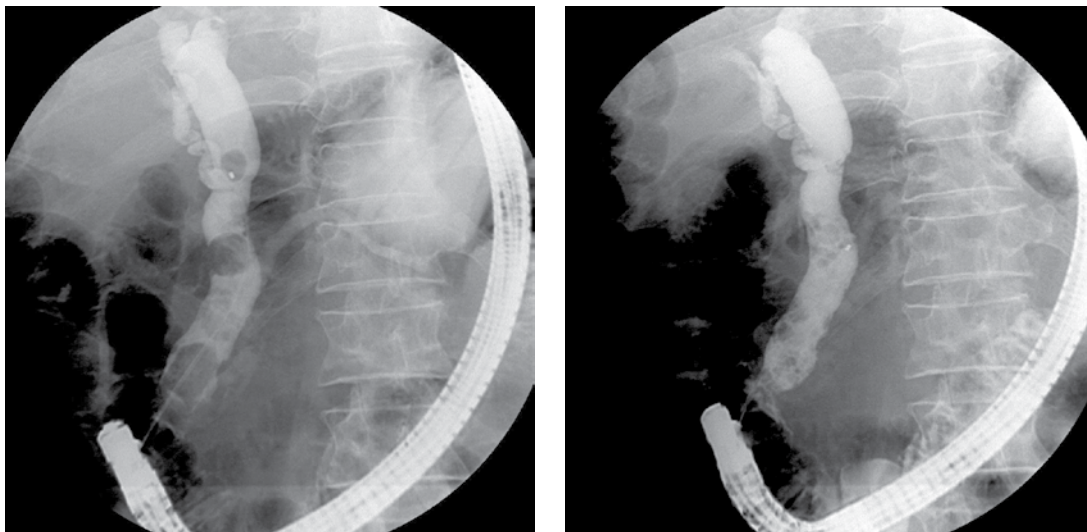
Case 14

Wiriyaporn Ridditid, MD.

Rungsun Rerknimitr, MD.

A 62-year-old with a history of post-Billroth II gastrectomy 20 years ago presented with fever, jaundice, and right upper quadrant pain for 2 days.

Endoscopic retrograde cholangiopancreatography (ERCP) was performed as shown. The duodenoscope was able to reach the papilla of Vater via the afferent limb. Cholangiogram revealed multiple filling defects in the common bile duct. Balloon extraction revealed multiple fragments of stones. Noted the position of the scope appeared different from the scope performed in the normal anatomy (Figures 1-2).



Figures 1-2 Awkward scope position in the afferent limb was observed. The cholangiogram revealed multiple CBD stones

The diagnosis was post-Billroth II gastrectomy with common bile duct stones causing acute cholangitis.

Discussion:

In patients with bile duct stones who have undergone Billroth II gastrectomy, the anatomical change results in technical difficulties in duodenal intubation and biliary cannulation. This type of gastric anatomy carries a lower success rate of therapeutic procedure and higher complications than the standard ERCP and frequently, either surgery or percutaneous approach is selected as an alternative approach. The reported success rate of reaching the papilla of Vater is 63–87%^{1, 2}. Biliary cannulation in patients with Billroth II gastrectomy must be done from a reversed position. Sometimes, using an attached cap at the tip of end viewing scope and using a swing-tip cannula (Olympus, Tokyo, Japan) are reportedly to be effective techniques for achieving biliary cannulation^{1, 2}.

References

1. Nakahara K, Horaguchi J, Fujita N, et al. Therapeutic endoscopic retrograde cholangiopancreatography using an anterior oblique-viewing endoscope for bile duct stones in patients with prior Billroth II gastrectomy. J Gastroenterol 2009;44:212-7.
2. Cicek B, Parlak E, Disibeyaz S, et al. Endoscopic retrograde cholangiopancreatography in patients with Billroth II gastroenterostomy. J Gastroenterol Hepatol 2007; 22:1210-3.



Case 15

Toomas Kariis, MD.

Rungsun Rerknimitr, MD.

A 51-year-old Estonian male patient with a history of benign biliary stricture from chronic pancreatitis presented with recurrent obstructive jaundice. He had undergone ERCP with plastic stent insertion to dilate the stricture twice (Figure 1). Unfortunately, the stricture recurred after stent removal (Figure 2). The third ERCP was performed to insert a fully covered metallic stent (Wallflex, Boston Scientific, MA) to achieve stricture resolution. A double pigtail 10 Fr. 5 cm. plastic stent (Wallstent, Boston Scientific, MA) was inserted into the metallic stent to prevent migration (Figures 3-4). There is a plan to remove these stents in the next 6 months to maintain the success of this treatment.



Figure 1 *The previous plastic stent failed to solve the stricture.*

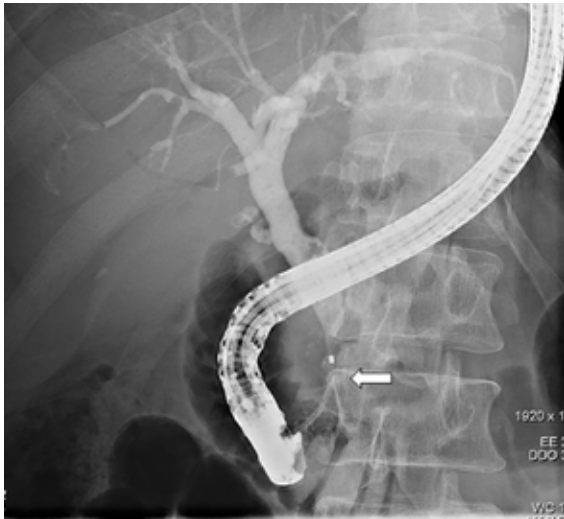


Figure 2 A distal common bile duct stricture (white arrow) was confirmed during the third ERCP.



Figure 3 One fully covered metallic stent and one double pigtail stent were inserted.



Figure 4 Endoscopic view of the double stenting.

Diagnosis:

Benign biliary stricture post metallic and plastic stenting

Discussion:

Benign biliary stricture is one of the complications of chronic pancreatitis¹. The stricture occurs due to the fibroelastic tissue of the post inflamed pancreas. Sometimes, stones, inflammatory mass, and pseudocyst may contribute as the causes for the extrinsic compression. However, these factors can be resolved spontaneously or after the causes

References

have been treated. Unfortunately, a lot of patients still have persistent biliary stricture despite the disappearance of all these conditions. Therefore biliary drainage by endoscopy or surgery may be required. The previous literatures did not show the impressive outcome of the plastic stent therapy^{2, 3}. Recently, the removable fully covered stent has been introduced as a new hope for this condition and the short-term resolution of the stricture after stent removal can be achieved in > 70% of patient^{4, 5}. However, stent migration is one of the concerns. The special treat in this case is the double pigtail stent. We hope that the pigtail stent may prevent metallic stent migration.

1. Judah JR, Draganov PV. Endoscopic therapy of benign biliary strictures. *World J Gastroenterol* 2007 14;13:3531-9.
2. Wilcox CM, Varadarajulu S. Endoscopic therapy for chronic pancreatitis: an evidence-based review. *Curr Gastroenterol Rep* 2006;8:104-10.
3. Delhaye M, Arvanitakis M, Bali M, et al. Endoscopic therapy for chronic pancreatitis. *Scand J Surg* 2005;94:143-53.
4. Isayama H, Nakai Y, Togawa O, Covered metallic stents in the management of malignant and benign pancreatobiliary strictures. *J Hepatobiliary Pancreat Surg* 2009;16:624-7.
5. Mahajan A, Ho H, Sauer B, Phillips MS, et al. Temporary placement of fully covered self-expandable metal stents in benign biliary strictures: midterm evaluation (with video). *Gastrointest Endosc* 2009;70:303-9.



Case 16

Thawatchai Akaraviputh, MD.

Somchai Leelakusolvong, MD.

Nonthalee Pausawasdi, MD.

Asada Methasate, MD.

Wichit Srikureja, MD.

Kazuo Ohtsuka, MD.

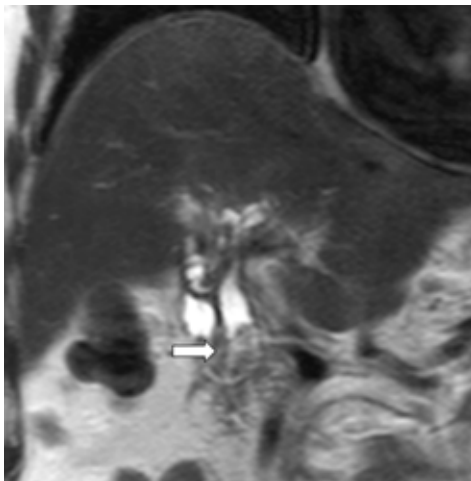


Figure 1 MRCP showed multiple filling defects (white arrow) with dilated CBD.

A 78-year-old male had a history of a perforated peptic ulcer 10 years ago and underwent a subtotal gastrectomy with Billroth II Roux-en-Y anastomosis and later he also underwent an open cholecystectomy for complicated acute cholecystitis. He presented to us with a history of acute ascending cholangitis. MRCP revealed extrahepatic biliary tract dilatation and multiple CBD stones (Figure 1). ERCP using a duodenoscope failed to reach the afferent limb. Single balloon enteroscope (SIF-Q180, Olympus Optical Co, Ltd, Tokyo, Japan) was subsequently used to reach the ampulla (Figure 2) and CBD cannulation was obtained with a 7-Fr Soehendra dilator. Cholangiogram showed marked dilatation of CBD with multiple CBD stones (Figure 3). Precut sphincterotomy was performed with an isolated-tip papillotome (Iso-Tome; MTW Endoskopie, Wesel, Germany) (Figure 4) as the standard catheter was too short for the scope length. CBD stones were completely removed using a combination of balloon catheter and Dormia basket without complications.

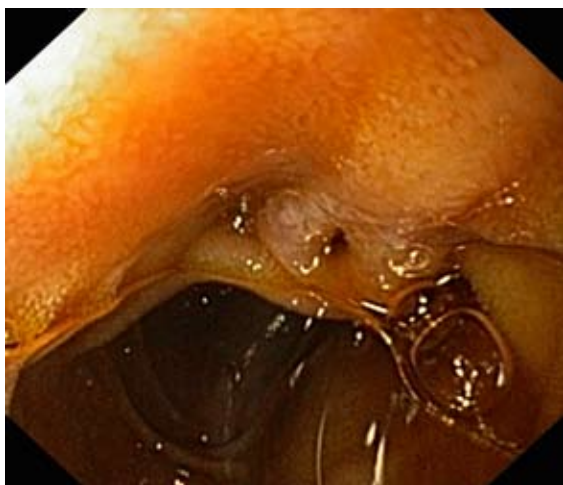


Figure 2 *The Single Balloon Endoscope at the ampulla.*

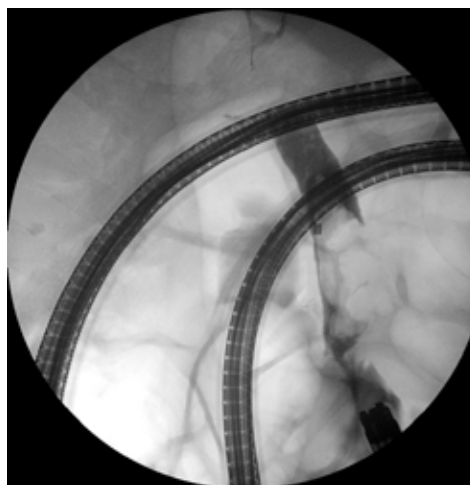


Figure 3 *Cholangiogram revealing multiple retained CBD stones situated inside a marked dilated CBD.*

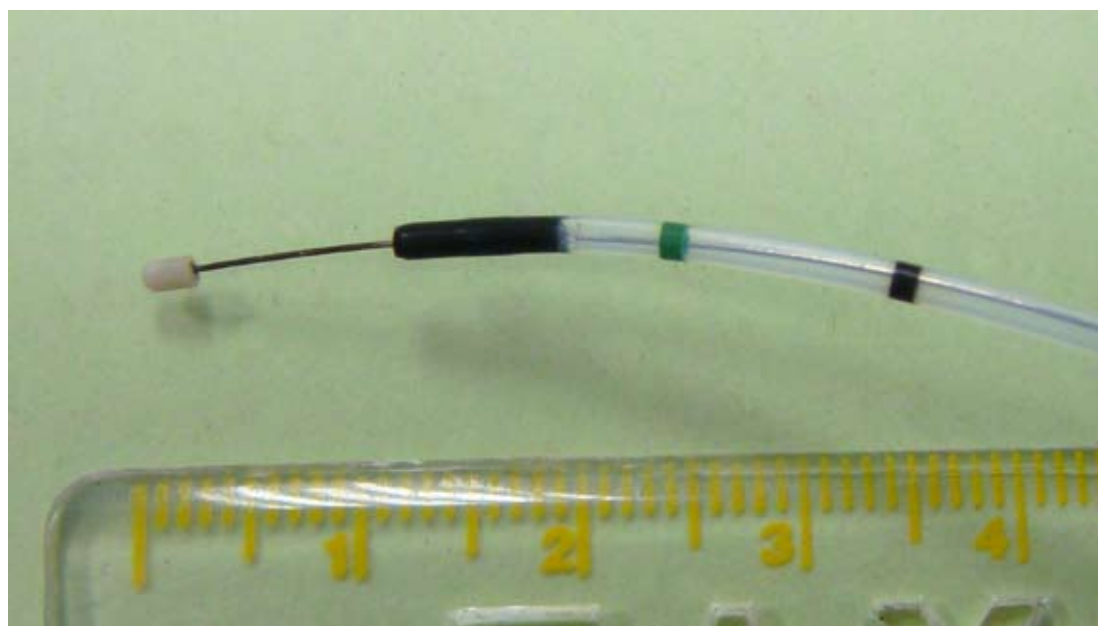


Figure 4 *Iso-Tome with semi-oval-shaped tip of epoxide adhesive used for precut sphincterotomy.*

Diagnosis:

Single balloon enteroscopy assisted endoscopic retrograde cholangiopancreatography and precut sphincterotomy as an inovative treatment for retained common bile duct stones in Billroth II gastrectomy patient.

Discussion:

In a patient with altered anatomic orientation such as Billroth II gastrectomy or Roux-en-Y anastomosis can be technically challenging when performing endoscopic retrograde cholangiopancreatography (ERCP) with a standard duodenoscope. Thus ERCP has a lower success rate in these patients¹⁻⁴. It may be easier to identify and advance through the afferent limb using end-viewing endoscope than side-viewing endoscope⁵. Single-balloon enteroscopy (SBE) may improve the success rate in identifying and biliary and pancreatic orifices which allows endoscopists to accomplish the intervention.

In conclusion, SBE-guided ERCP can be an alternative method for performing ERCP procedures in patients with altered anatomy. A cost-efficient analysis for the use of these accessory devices may be required to improve the care among this selected subgroup.

References

1. Bergmann JJ, Berkel A, Bruno MJ, et al. A randomized trial of endoscopic balloon dilatation and endoscopic sphinctertomy for removal of bile duct stone in patients with prior Billroth II gastrectomy. *Gastrointestinal Endoc* 2001;53:19-26.
2. Hintze RE, Adler A, Veltzke W, et al. Endoscopic access to papilla of vater for ERCP in patients with Billroth II or Roux-en Y gastrojejunostomy. *Endoscopy* 1997;29: 69-73.
3. Forbes A, Cotton PB. ERCP and sphincterotomy after Billroth II gastrectomy. *Gut* 1984; 25:971-4.
4. Osnes M, Rosseland AR, Aabakken L. Endoscopic retrograde cholangiography and endoscopic papillotomy in patients with a previous Billroth II resection. *Gut* 1986;27:1193-8.
5. Silvis SE. Endoscopic retrograde sphinctertomy. In : Silvis SE, ed. *Therapeutic Gastrointestinal Endoscopy*. New York: Igaku-Shoin 1984;198-240.



Case 17

Pradermchai Kongkam, MD.

A 64-year-old man, presented with right sided abdominal pain and fever for 1 day. His pain lasted about 2 hours. He had a history of heavy alcoholic drinking in the past. Past medical history was significant for diabetes and chronic alcoholic pancreatitis. He underwent a Puestow's operation 3 years ago as a treatment of chronic pancreatitis. Physical examination was remarkable for body temperature of 38 Celsius and mild tenderness at the epigastric area. Otherwise, the rest of examination was unremarkable. CBC; WBC 14,000 /ul, Neutrophils 85%, Lymphocyte 8.2%. LFT; total bilirubin 1.6 mg/dL, AST 22 U/L, ALT 22 U/L, Alkaline phosphates 101 U/L, Amylase 81 U/L, Lipase 21 U/L. EUS was scheduled for an evaluation of abdominal pain. It revealed a dilated main pancreatic duct with pancreatic ductal stone as shown in figure 1. ERCP was scheduled for evaluation of his jaundice. Cholangiogram revealed narrowing distal common bile duct (CBD) with upstream bile duct dilatation (figure 2). A plastic stent was successfully placed across the stricture (figure 3). His abdominal pain was much improving after this biliary stent was placed. To confirm all findings, subsequent CT scan nicely demonstrated calcification in pancreatic duct and parenchyma (figure 4). In addition, it satisfactorily showed a biliary stent in place transversely with surrounding pancreatic stone.



Figure 2 Cholangiogram demonstrated distal common bile duct narrowing with upstream bile duct dilatation. It also demonstrated calcification in the pancreatic head area.

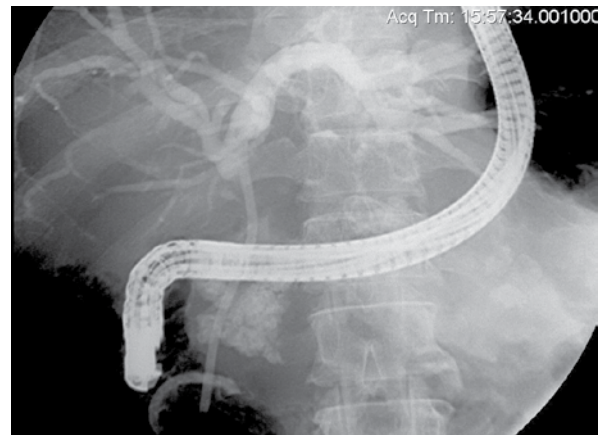


Figure 3 ERCP demonstrated a biliary plastic stent placed from intrahepatic bile duct through duodenum. It was successfully placed across the stricture.

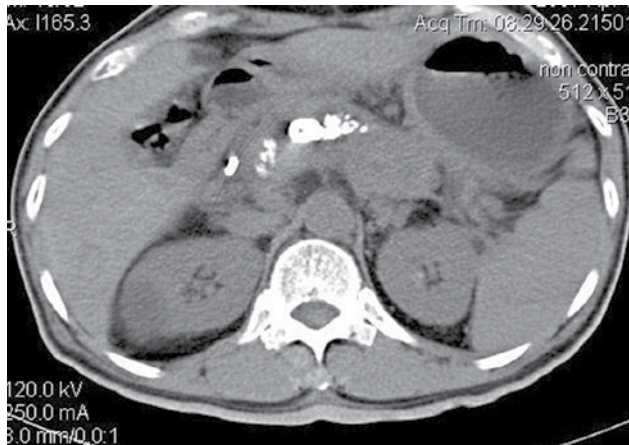


Figure 4 CT scan of the abdomen demonstrated calcification in the main pancreatic duct in area of neck and body.

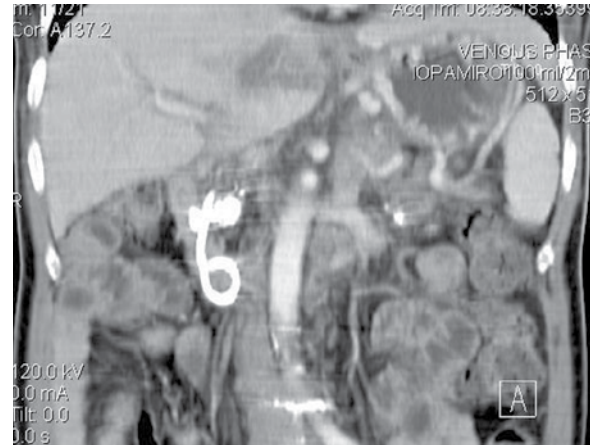


Figure 5 A coronal view of CT scan demonstrated a plastic stent was placed along common bile duct. It ran across calcification in the head of pancreas.

Diagnosis:

Biliary stricture from chronic pancreatitis

Discussion:

Abdominal pain is one of devastating problems for patients with chronic pancreatitis¹. Pancreatic pain may occur from many causes such as pseudocyst, pancreatic ductal obstruction or bile duct obstruction². In this case, since this gentleman had mild jaundice and was proven as secondary to the biliary obstruction by a cholangiogram. Biliary stent placement was helpful in relieving his pain. However, we have to address here that his pain might improve itself from his natural course³. Therefore, a careful following up for this patient is a crucial management. If the pain still persist or recur, other therapeutic options may be considered. These include endoscopic pancreatic ductal drainage, endoscopic pancreatic stone removal, EUS guided celiac plexus block, etc⁴.

References

1. Kongkam P, Wagner DL, Sherman S, et al. Intrathecal narcotic infusion pumps for intractable pain of chronic pancreatitis: a pilot series. *Am J Gastroenterol* 2009; 104:1249-55.
2. Kowalczyk LM, Draganov PV. Endoscopic therapy for chronic pancreatitis: technical success, clinical outcomes, and complications. *Curr Gastroenterol Rep* 2009;11:111-8.
3. Ammann RW, Muellhaupt B. The natural history of pain in alcoholic chronic pancreatitis. *Gastroenterology* 1999;116: 1132-40.
4. Bornman PC, Marks IN, Girdwood AW, et al. Pathogenesis of pain in chronic pancreatitis: ongoing enigma. *World J surg* 2003;27: 1175-82.



Case 18

Rapat Pittayanon, MD.

Rungsun Rerknimitr, MD.

A 50-year-old Thai man with underlying of cholangiocarcinoma had metallic stent insertion 6 months ago. He presented with the first episode of upper GI bleeding. The physical examination was unremarkable except mild anemia. EGD was performed as shown in the picture.

EGD finding: An oval shape ulcer with minimal bloody oozing and some hemorrhagic spots in the second part of duodenum was seen being impinged upon by the sharp edge of metallic stent



Diagnosis:

Post metallic stent placement bleeding.

Discussion:

Post metallic stent placement bleeding is considered rare at <5%, and has not been studied well. The etiologies are probably caused from inflammation and collagenous reaction at the underlying mucosa or pressure necrosis of the duodenal mucosa at the opposite site from the tumor, followed by chronic inflammatory response and epithelization. It is usually stop spontaneously, otherwise; it can be managed by standard any hemostatic techniques including argon plasma coagulation¹.

Reference

1. Wai CT, Khor C, Lim SE, Ho KY. Post-metallic stent placement bleeding caused by stentinduced ulcers. World J Gastroenterol 2005 28;11:5739-41.



Case 19

Suchart Sawadsukho

Jaturong Amornrattanakosol, MD.

Rungsun Rerknimitr, MD.

A 31-year-old Thai male with underlying adenocarcinoma of the pancreatic head had 2 metallic stents placed for his obstructive jaundice. The first stent was an uncovered metallic (Wallstent, Boston Scientific, Natick, MA) and the second stent was a partially covered stent. Six months later, while he had been receiving a palliative chemotherapy he experienced another bout of cholangitis. The third ERCP was performed, and duodenoscopic view showed an obstructed distal end of the SEMS by tissue (Figure 1). A snare was used to remove the second stent (Figure 2) and the third stent which was a fully covered stent (Wallflex, Boston Scientific, Natick, MA) was placed successfully (Figure 3, 4).

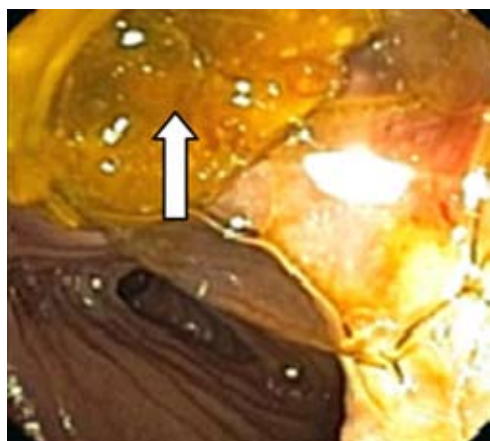


Figure 1 Duodenoscopic side view showed an occluded stent at the distal end (arrow)

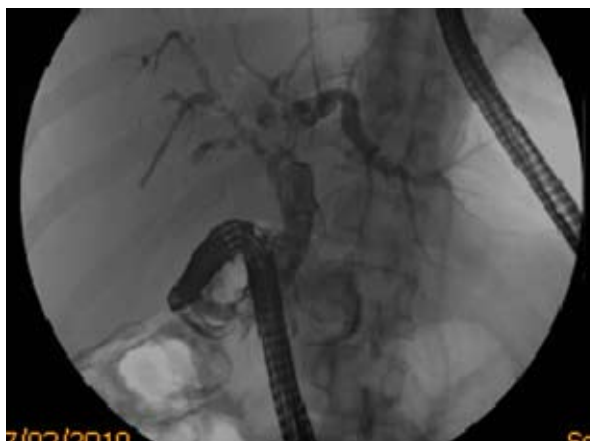


Figure 2 Fluoroscopic view showed a snare removal of the second stent



Figure 3 Fluoroscopic view showed the third stent in a good position



Figure 4 Showing the wide opening of biliary orifice after the third stent placement

Diagnosis:

Tumor ingrowth of the distal end of a partially covered stent that successfully treated by stent removal and insertion of a fully covered stent (metallic stent exchange).

Discussion:

It has been well accepted that an

uncovered stent cannot be removed. Thus whenever, tissue ingrowth develop, the only treatment is to insert another metallic stent^{1, 2}. The new concept on removal of partially covered or fully covered stent has been attempted and this can be done for a metallic stent exchange. However, this approach needs more study to prove the benefit that can be better than just placing another metallic stent^{3, 4}.

References

1. Togawa O, Kawabe T, Isayama H, et al. Management of occluded uncovered metallic stents in patients with malignant distal biliary obstructions using covered metallic stents. *J Clin Gastroenterol* 2008;42:546-9.
2. Ornellas LC, Stefanidis G, Chuttani R, et al. Covered Wallstents for palliation of malignant biliary obstruction: primary stent placement versus reintervention. *Gastrointest Endosc* 2009;70:676-83.
3. Kahaleh M, Tokar J, Le T, Yeaton P. Removal of self-expandable metallic Wallstents. *Gastrointest Endosc* 2004;60:640-4.
4. Park do H, Kim MH, Moon SH, et al. Feasibility and safety of placement of a newly designed, fully covered self-expandable metal stent for refractory benign pancreatic ductal strictures: a pilot study (with video). *Gastrointest Endosc* 2008;68:1182-9.



Case 20

Pradermchai Kongkam, MD.

A 73-year-old man, presented to our ERCP team for a suspicion of post cholecystectomy bile leakage. He presented to another hospital with acute abdominal pain 2 months ago. He was admitted into another hospital for the treatment. CT scan of the abdomen at that time demonstrated a thick wall gall bladder with peri-cholecystic fluid without intrahepatic bile duct dilatation. He was then diagnosed as having acute cholecystitis. He had been admitted for a few days and successfully conservatively treated. He was referred to our hospital for cholecystectomy. No significant medical or surgical history was reported. He denied alcoholic drinking and smoking. Physical examination was unremarkable. Initial blood tests including CBC, LFTs were unremarkable. Laparoscopic cholecystectomy was performed. Unfortunately, at day 1 postoperatively, he felt severe abdominal pain. Physical examination showed tenderness at the right upper quadrant of abdomen. Bowel sound decreased. He was then suspected as having a bile leakage. ERCP was scheduled for an evaluation. Plain film showed a surgical clip in right upper quadrant abdomen as shown in figure 1. Dye was injected into the common bile duct during ERCP. Cholangiogram showed leakage of contrast from the cystic duct stump around surgical clip as shown in figure 2. A 10 Fr single pigtail biliary plastic stent was then successfully placed into the right intrahepatic duct. Postoperative course was uneventful. His abdominal pain was much improved.



Figure 1 Fluoroscopic view demonstrated a surgical clip placed at the right upper quadrant of abdomen. It was consistent with post cholecystectomy clip.



Figure 2 Cholangiogram demonstrated contrast extravasation around cystic duct stump near by pre-existing surgical clip (arrow).

Diagnosis:

Post-cholecystectomy cystic duct stump leak

Discussion:

Post cholecystectomy bile duct injuries occurred in approximately 0.5% of cholecystectomy procedure¹. Approximately half of patients with bile duct injuries presented with bile leak. To treat these bile duct injuries, multidisciplinary approach is needed. In addition, urgent referral the patients with these complications should be done as soon as

possible to prevent unexpected additional complications such as biloma, sepsis, death etc². ERCP with internal biliary stent insertion can be a successful therapeutic procedure in approximately 80% of endoscopy treated cases³. Biliary drainage for bile leak include naso-biliary (NB) tube drainage or internal biliary stent via ERCP⁴. In this patient, his presenting symptom was quite typical for post operative bile leak. This was confirmed with cholangiogram. His symptoms were dramatically improved after the procedure. The repeat cholangiogram for stent removal was done at 6 weeks after.

References

1. Richardson MC, Bell G, Fullarton GM. Incidence and nature of bile duct injuries following laparoscopic cholecystectomy: an audit of 5913 cases. West of Scotland Laparoscopic Cholecystectomy Audit Group. The British journal of surgery 1996;83:1356-60.
2. Sicklick JK, Camp MS, Lillemoe KD, et al. Surgical management of bile duct injuries sustained during laparoscopic cholecystectomy: perioperative results in 200 patients. Annals of surgery 2005;241:786-92.
3. Nuzzo G, Giuliani F, Giovannini I, et al. Advantages of multidisciplinary management of bile duct injuries occurring during cholecystectomy. American journal of surgery 2008;195:763-9.
4. Pinkas H, Brady PG. Biliary leaks after laparoscopic cholecystectomy: time to stent or time to drain. Hepatobiliary Pancreat Dis Int 2008;7:628-32.



Case 21

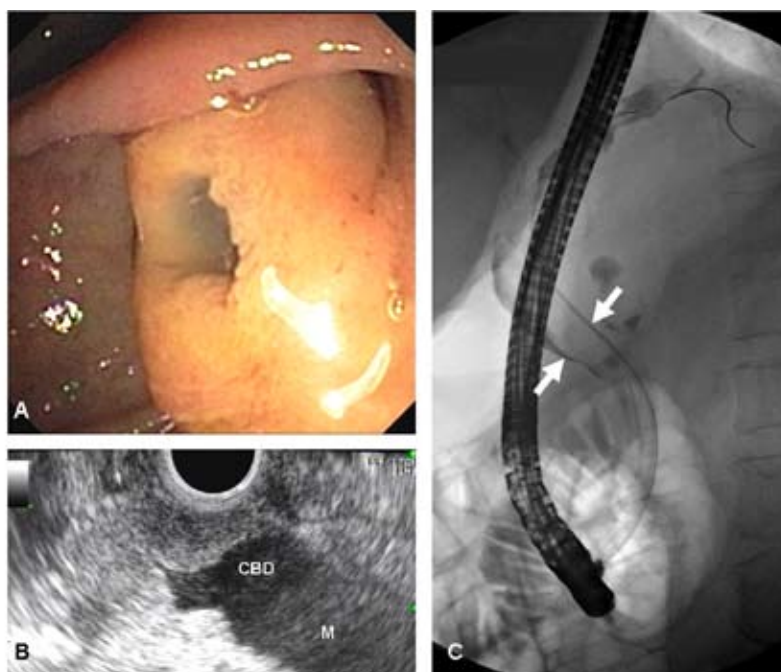
Supot Pongprasobchai, MD.

A 72-year-old woman had recurrent ascending cholangitis for 4 years. Previous ERCP elsewhere 2 and 3 years ago revealed irregular dilatation of common and intrahepatic bile ducts. She was diagnosed and treated as oriental cholangiohepatitis. She now presented with ascending cholangitis.

Endoscopic findings:

Endoscopic view of the EUS showed a wide, patulous papilla with mucin protrusion from the papilla (Figure A). EUS revealed a markedly dilated common bile duct (CBD, 14 mm. in diameter) down to the papilla with echogenic cloud, likely represented mucin content inside the common bile duct (M in Figure B). No mass was seen in the CBD. Both intrahepatic bile ducts were dilated but the pancreatic duct was normal.

ERCP showed multiple irregular filling defects inside the markedly dilated common bile duct (arrow in Figure C). With balloon sweeping, there was a lot of mucin coming from the CBD. Brush cytology was positive for malignancy cells.



Diagnosis:

Intraductal papillary mucinous neoplasm of the bile duct (IPMN-B)

Discussion:

Intraductal papillary mucinous neoplasm (IPMN) of the pancreas is a well-established distinct type neoplasm of the pancreas with a pathognomonic finding of the patulous papilla with mucin protrusion from the papilla. However, intraductal papillary neoplasm of the bile duct (IPMN-B), which was first described in 2000¹ has been

reported to have this finding as well^{1, 2}. IPMN-B is an uncommon form of biliary tumor, but is very similar to IPMN of the pancreas. It is speculated that the embryonic origin of the pancreas and biliary tract are shared. Most case reports showed that patients usually presented with cholangitis, jaundice or incidentally found biliary dilatation.²⁻⁴ Ultrasound or CT scan usually demonstrates only biliary dilatation without mass. MRCP may additionally demonstrate mucin in the bile ducts but ERCP is the imaging of choice since it can also view a characteristic patulous papilla with mucin protrusion, which is often present. Curative treatment is surgery.

References

1. Kim HJ, Kim MH, Lee SK, et al. Mucin-hypersecreting bile duct tumor characterized by a striking homology with an intraductal papillary mucinous tumor (IPMT) of the pancreas. *Endoscopy* 2000;32:389-93.
2. Tsuyuguchi T, Sakai Y, Sugiyama H, et al. Endoscopic diagnosis of intraductal papillary mucinous neoplasm of the bile duct. *J Hepatobiliary Pancreat Surg* 2009.
3. Yeh TS, Tseng JH, Chiu CT, et al. Cholangiographic spectrum of intraductal papillary mucinous neoplasm of the bile ducts. *Ann Surg* 2006;244:248-53.
4. Paik KY, Heo JS, Choi SH, et al. Intraductal papillary neoplasm of the bile ducts: the clinical features and surgical outcome of 25 cases. *J Surg Oncol* 2008;97:508-12.

