Endoscopic tamponade using a fully covered self-expandable metallic stent for massive biliary bleeding from a pseudoaneurysm rupture during metallic stent removal

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Hemobilia is a rare but life-threatening adverse event related to pancreatobiliary diseases, transhepatic percutaneous intervention, or endoscopic procedures including ERCP and interventional EUS.[1,2] The rupture of the pseudoaneurysm after plastic stent or self-expandable metallic stent (SEMS) insertion has been reported to induce massive hemobilia, which requires prompt transcatheter arterial embolization (TAE) for hemostasis.[2,3] In addition, hemobilia has occurred after plastic stent removal, according to several previous reports.[4-8] However, hemobilia after SEMS removal is extremely rare.[9]

A 65-year-old woman with advanced pancreatic head cancer was referred to our hospital. She had received chemotherapy after placement of a fully covered SEMS (10-mm diameter, 8-cm long; Hanarostent, MI Tech, Seoul, Korea) in the bile duct and a plastic stent in the gallbladder for concomitant biliary obstruction and cholecystitis (Fig. 1A). Three months later, cholangitis recurred because of SEMS dysfunction and disease progression without biliary bleeding or a pseudoaneurysm being detected on CT. ERCP was performed to resolve cholangitis, and an 8.5F plastic stent was inserted into the SEMS (Fig. 1B). Two weeks later, a reintervention was performed to sweep biliary sludge and/or exchange the SEMS by using a side-viewing endoscope (TJF-260V; Olympus Medical Systems, Tokyo, Japan).

On removal of the previous plastic stent, a large amount of debris was observed in the SEMS. Therefore, SEMS removal and reinsertion for longer stent patency were planned. After successful extraction of the SEMS by using a snare through the endoscope, massive bleeding from the biliary tract was suddenly exacerbated (Video 1, available online at www.giejournal.org). Despite difficulty in identifying the papillary orifice because of massive bleeding, biliary cannulation and confirmation of confluence of the right and left hepatic ducts by cholangiography were successfully achieved.

Continuous fresh blood spurting from the papilla resulted in hemodynamic and respiratory instability (hypotension with systolic pressure <80 mm Hg, heart rate >140/min, and SpO_2 <80%) within a few minutes. A radiologist was consulted for an emergent TAE, and we simultaneously attempted to insert a 10-mm-diameter SEMS (8-cm long, Bonastent; Medico's Hirata, Tokyo, Japan) for tamponade. After deploying the distal end of the SEMS under fluoroscopic guidance, biliary bleeding gradually slowed on the endoscopic view, followed by resolution of hypotension and tachycardia.

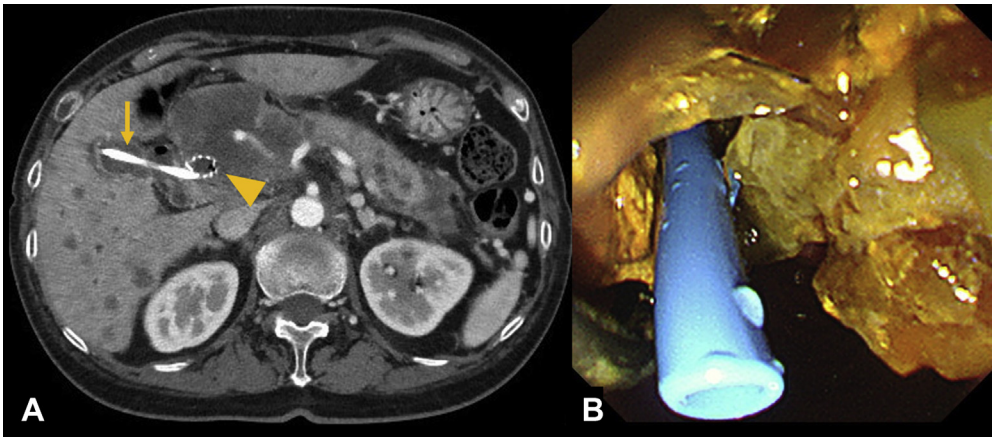

Figure 1. A, Abdominal CT shows a fully covered self-expandable metallic stent (SEMS, *arrowhead*) in the bile duct and a plastic stent (*arrow*) in the gallbladder. No biliary bleeding or pseudoaneurysm was observed. **B,** The endoscopic view shows SEMS occlusion by biliary sludge. We inserted an 8.5F plastic stent into the SEMS to resolve cholangitis.

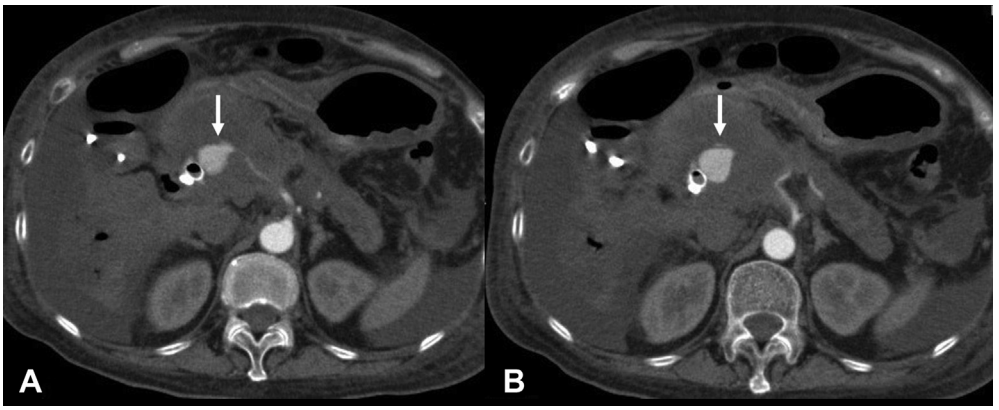

Figure 2. A, The CT shows a 2-cm pseudoaneurysm (*arrow*) arising from a branch of gastroduodenal or proper hepatic arteries and located in a tumor of the pancreas that was not evident 2 weeks earlier. **B,** The pseudoaneurysm was just adjacent to the biliary self-expandable metallic stent.

The CT scan performed immediately after the endoscopic procedures revealed a 2-cm pseudoaneurysm in the pancreatic tumor; this was adjacent to the SEMS and was not evident on CT 2 weeks earlier (Fig. 2A and B). Subsequently, angiography and TAE were successfully performed for the pseudoaneurysm (Fig. 3A and B), and the patient had no recurrence of biliary bleeding.

Although previous reports have described endoscopic or radiological intervention for hemobilia, the criterion standard treatment has not yet been established.[3,7] Hemobilias with successful hemostasis using SEMS were mainly due to portobiliary fistula.[6,7,9,10] Tonozuka et al[5] reported a rare application of the SEMS in the rupture of a pseudoaneurysm. To the best of our knowledge, this is the first report of the use of an SEMS for biliary bleeding tamponade due to an intratumoral pseudoaneurysm of the pancreas. SEMS insertion might be helpful in slowing bleeding or temporal hemostasis due to a rupture of the pseudoaneurysm, despite its dependence on the site of bleeding.[5] We should consider various treatment options, including endoscopic, angiographic, and surgical procedures, because hemobilia can occur at any time, not only after endoscopic insertion of plastic/metallic stents but also during their extraction.[5,6,8,9]

Removal of the SEMS is sometimes attempted because of stent dysfunction. However, we must consider the possibility of massive hemobilia. During SEMS removal, it is necessary to have a new SEMS at hand.

DISCLOSURE

All authors disclosed no financial relationships.

Abbreviations: CT, computed tomography; SEMS, self-expandable metallic stent; TAE, transcatheter arterial embolization.

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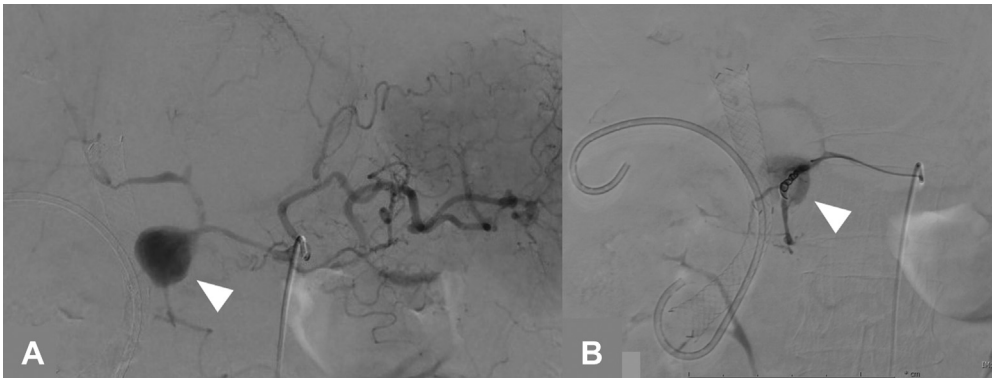

Figure 3. Angiography showing a pseudoaneurysm (*arrowhead*) of the gastroduodenal artery **(A)**, which was successfully treated with coil embolization **(B)**.

REFERENCES

1. Tien T, Tan YC, Baptiste P, et al. Haemobilia in a previously stented hilar cholangiocarcinoma: successful haemostasis after the insertion of fcSEMS. Oxf Med Case Reports 2020:65-8.
2. Nezu Y, Nakaji S, Fujii H, et al. Pseudoaneurysm caused by a self-expandable metal stent: a report of three cases. Endoscopy 2014;46:248-51.
3. Satoh T, Matsubayashi H, Ishiwatari H, et al. Rupture of pseudoaneurysm after biliary metallic stent placement. Intern Med 2019;58:1453-7.
4. Tsuji S, Itoi T, Sofuni A, et al. Life-threatening hemorrhage from the papilla following stent removal (with video). J Hepatobiliary Pancreat Sci 2011;18:751-3.
5. Tonozuka R, Itoi T, Sofuni A, et al. Hemostasis using a fully covered self-expandable metal stent for marked bleeding from the bile duct following stent removal (with videos). J Hepatobil Pancreat Sci 2013;20:254-6.
6. Goenka MK, Harwani Y, Rai V, et al. Fully covered self-expandable metal biliary stent for hemobilia caused by portal biliopathy. Gastrointest Endosc 2014;80:1175.
7. So H, Song TJ, Lee D, et al. Endoscopic treatment of recurrent bleeding from a portobiliary fistula with a fully covered self-expandable metal stent. Endoscopy 2015;47:E616-7.
8. Miyamoto H, Tanaka K, Nakamura F, et al. Massive hemobilia following plastic stent removal in common bile duct cancer associated with primary sclerosing cholangitis (with video). Clin J Gastroenterol 2019;12:46-51.
9. Layec S, D'Halluin PN, Pagenault M, et al. Massive hemobilia during extraction of a covered self-expandable metal stent in a patient with portal hypertensive biliopathy. Gastrointest Endosc 2009;70:555-6.
10. Kim SY, Cho JH, Kim EJ, et al. Successful hemostasis using a covered self-expandable metallic stent for spurting hemobilia in patients with advanced pancreatic cancer–induced portal biliopathy. Gastrointest Endosc 2016;84:858-60.

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