



Successful peroral cholangioscopic extraction of migrated endovascular coils into the bile ducts 2 years following right hepatic artery pseudoaneurysm endovascular treatment

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CASE REPORT

Pseudoaneurysms of the hepatic artery (PAH) are uncommon and occur primarily as a adverse event of trauma (accidental or iatrogenic, such as liver drainage or liver biopsy).¹ On rare occasions, hepatic abscesses have been implicated in the genesis of PAH.^{2,3} Proper identification of PAH and subsequent intervention via embolization has demonstrated favorable outcomes. However, embolization coils have been reported to undergo migration to diverse anatomical sites, including the stomach, ileo-cecal valve, duodenum, rectum, pancreas, and urinary tract, consequently leading to delayed adverse events, as evidenced in several documented case reports.⁴⁻¹⁴ The presented video displays a case of coils that eroded from a hepatic artery aneurysm into the biliary tree.

A 66-year-old female patient known for acute myeloid leukemia underwent coil embolization for a hepatic pseudoaneurysm that had arisen after multiple percutaneous drainages of hepatic abscesses (Fig. 1). Six months after coil embolization, the patient developed a systemic fungal infection with *Rhizomucor* species. Due to persistent recurrence of fungal infection over several months, despite administering a regimen consisting of amphotericin B, anidulafungin, and subsequently isavuconazole, an abdominal CT scan was performed. The imaging findings showed a substantial reduction in the size of hepatic abscesses, with a residual heteroge-

Abbreviation: PAH, pseudoaneurysms of the hepatic artery.

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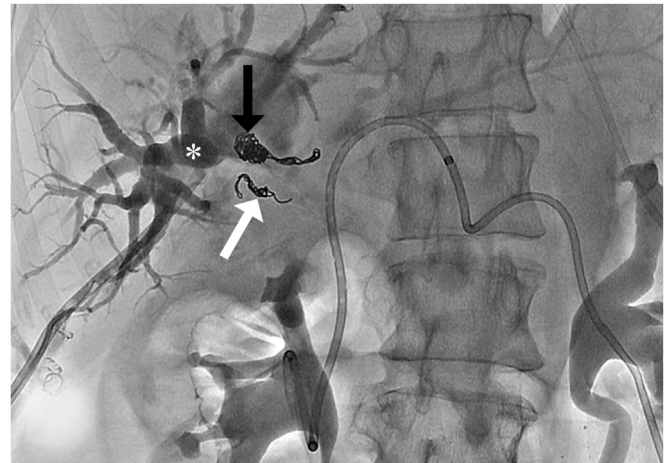


Figure 1. Post-embolization control with coil placement in depicted pseudoaneurysms (black and white arrows) and dilated right hepatic biliary ducts (asterisk).



Figure 2. Coronal CT image showing coils at hepatic hilum (black arrow) and dilatation of right lobe bile ducts upstream of coils (arrowheads).

neous area noted in segment 8. Notably, the CT scan also demonstrated dilatation of the common bile duct (CBD) and the right bile duct, with important artifacts in the hepatic hilum attributed to the presence of coils (Fig. 2).

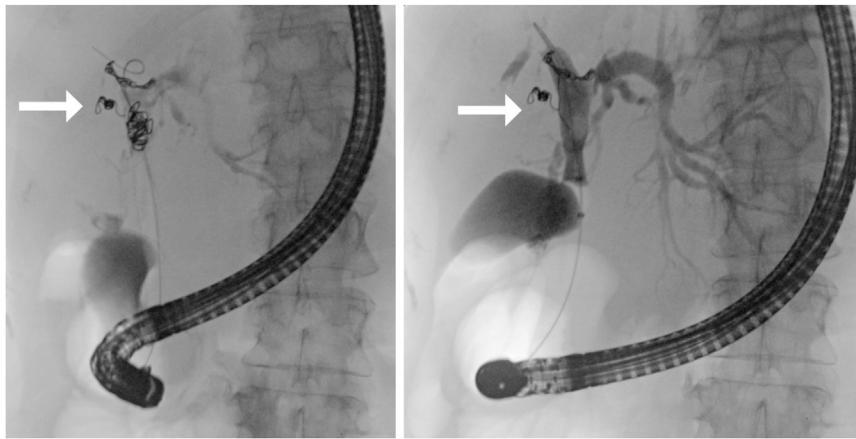


Figure 3. ERCP images before and after extraction of a coil having migrated from hepatic artery to common hepatic duct. Coil positions (*white arrows*) and some coils remained in liver parenchyma.

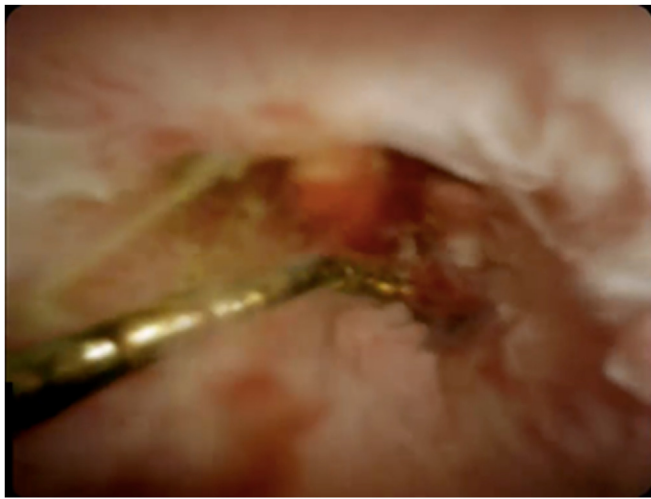


Figure 4. Visualization of coils impacted in the common bile duct during cholangioscopy.



Figure 5. Extraction of coils with SpyBite Biopsy Forceps.

Given these observations, the patient was referred to our Gastroenterology department for an elective ERCP. The ERCP procedure revealed CBD obstruction concomitant with the presence of coils (Fig. 3). The initial attempt to extract the coils via ERCP using papillotomy and balloon proved unsuccessful. Consequently, an ERCP with a cholangioscope (Spyglass, SpyScope DS 2; Boston Scientific, Marlborough, Mass, USA) was conducted a few days later, showing the migrated coils within the CBD and the right bile ducts (Fig. 4; Video 1, available online at www.videoie.org). The coils were extracted with special forceps (SpyBite; Boston Scientific) (Figs. 5 and 6; Video 1). Given the substantial thickness of the coils, the cholangioscope with the coils had to be completely removed through the duodenoscope. We then succeeded in achieving a normal cholangiogram at the end of the procedure (Fig. 7; Video 1). All coils in the bile ducts could be removed but some coils remained in the liver parenchyma (Fig. 3). The pa-

tient was discharged from the hospital and remained asymptomatic.

No intra-procedural or peri-procedural adverse events were observed, and the patient was discharged a few hours later in an asymptomatic state with complete coil extraction. Upon the 1-month follow-up assessment, the patient remains asymptomatic, and liver enzyme levels have completely normalized.

Coil migration into the CBD is a rare occurrence, historically necessitating surgical intervention. In the past published cases, coils have been removed by percutaneous cholangioscopy or by surgery.^{12,15}

In this video case presentation, we illustrate the effective retrieval of migrated coils through a cholangioscopic approach. The application of SpyBite Biopsy Forceps proved very useful to remove migrated endovascular coils while avoiding complex surgery associated with a high risk of adverse events.



Figure 6. Extracted coils from the bile ducts after successful removal.

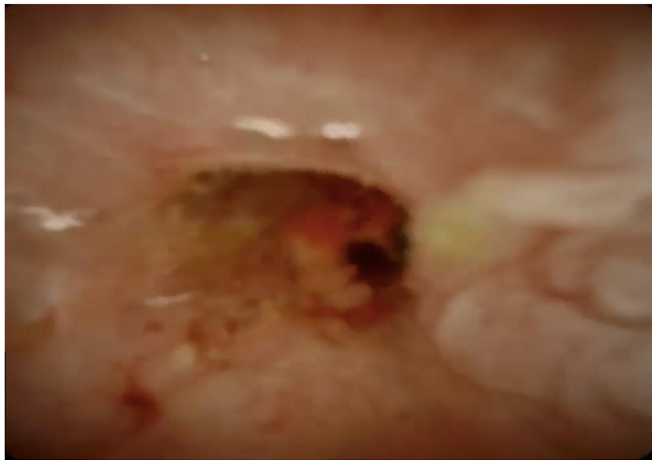


Figure 7. Common hepatic duct after removal of the coils.

DISCLOSURE

The authors disclosed no financial relationships relevant to this publication.

REFERENCES

- Goyal A, Madhusudhan KS, Gamanagatti S, Baruah B, Sharma R. Radiological management of multiple hepatic artery pseudoaneurysms associated with cholangitic abscesses. *Ind J Radiol Imaging* 2016;26:99-102.
- Khan A, Pal KMI, Khan HI. Hepatic artery pseudoaneurysm; a rare complication of amoebic liver abscess. *J Pak Med Assoc* 2011;61:839-40.
- Tacconi D, Lapini L, Giorni P, Corradini S, Caremani M. Pseudoaneurysm of the hepatic artery, a rare complication of an amoebic liver abscess. *J Ultrasound* 2009;12:49-52.
- Turaga KK, Amirlak B, Davis RE, Yousef K, Richards A, Fitzgibbons RJ Jr. Cholangitis after coil embolization of an iatrogenic hepatic artery pseudoaneurysm: an unusual case report. *Surg Laparosc Endosc Percutan Tech* 2006;16:36-8.
- Ozkan OS, Walser EM, Akinci D, Nealon W, Goodacre B, Guglielmi detachable coil erosion into the common bile duct after embolization of iatrogenic hepatic artery pseudoaneurysm. *J Vasc Interv Radiol* 2002;13:935-8.
- Tekola BD, Arner DM, Behm BW. Coil migration after transarterial coil embolization of a splenic artery pseudoaneurysm. *Case Rep Gastroenterol* 2013;7:487-91.
- Hewgley WP, Webb DL, Garrett HE. Migrated embolization coil causes intestinal obstruction. *J Vasc Surg Cases Innov Tech* 2018;4:8-11.
- Nomura Y, Gotake Y, Okada T, Yamaguchi M, Sugimoto K, Okita Y. Coil migration to the duodenum 1 year following embolization of a ruptured giant common hepatic artery aneurysm. *EJVES Short Rep* 2018;39:33-6.
- Dinter DJ, Rexin M, Kaehler G, Neff W. Fatal coil migration into the stomach 10 years after endovascular celiac aneurysm repair. *J Vasc Interv Radiol* 2007;18:117-20.
- Pratap A, Pokala B, Vargas LM, Oleynikov D, Kothari V. Laparoscopic endoscopic combined surgery for removal of migrated coil after embolization of ruptured splenic artery aneurysm. *J Surg Case Rep* 2018;2018.
- Han YM, Lee JY, Choi IJ, et al. Endoscopic removal of a migrated coil after embolization of a splenic pseudoaneurysm: a case report. *Clin Endosc* 2014;47:183-7.
- Van Steenberg W, Lecluyse K, Maleux G, Pirenne J. Successful percutaneous cholangioscopic extraction of vascular coils that had eroded into the bile duct after liver transplantation. *Endoscopy* 2007;39:E210-1.
- Takahashi T, Shimada K, Kobayashi N, Kakita A. Migration of steel-wire coils into the stomach after transcatheter arterial embolization for a bleeding splenic artery pseudoaneurysm: report of a case. *Surg Today* 2001;31:458-62.
- Phan J, Lall C, Moskowitz R, Clayman R, Landman J. Erosion of embolization coils into the renal collecting system mimicking stone. *West J Emerg Med* 2012;13:127-30.
- Rivory J, Menassel B, Lambin T, et al. Percutaneous cholangioscopy to remove endovascular coils that had migrated into the bile duct after right hepatic artery pseudoaneurysm embolization. *Endoscopy* 2021;53:E448-9.