Spontaneous fracture of a covered self-expandable biliary metal stent and endoscopic technique for removal

Resheed Alkhiari MBBS¹, Vishal Patel MD FRCPC², Lawrence Cohen MD MSc FRCPC²

CASE PRESENTATION

A 67-year-old woman was brought to the endoscopy unit in May 2014 for removal of a covered self-expanding metal stent (SEMS) from the common bile duct (CBD), initially placed in May 2013 to manage recurrent cholangitis. The patient developed idiopathic pancreaticobiliary dysmotility following cholecystectomy in 2001. She experienced recurrent episodes of pancreatitis and cholangitis for which she required numerous endoscopic retrograde cholangiopancreatograms, including the insertion of biliary plastic stents to facilitate drainage, extraction of CBD stones and/or clearing debris from the biliary tree. Her most recent intervention had been the insertion of a SEMS, which was effective in preventing recurrent cholangitis over the year.

On physical examination, she appeared to be fit, well-nourished and in no distress, with no pallor, jaundice or lymphadenopathy. An abdominal examination was unremarkable. Laboratory investigations were within normal limits, without any contraindications to endoscopy.

PROCEDURE

A duodenoscope was advanced into the duodenum according to the usual protocol. The SEMS was observed emanating from the established papillotomy, and the thread to be used to remove the stent was visualized. The stent was grasped and slowly pulled. This enabled the stent to contract to facilitate removal from the CBD. As the stent was being withdrawn, it fractured into two pieces (Figure 1). The distal part of the fractured stent (the smaller fragment) was removed and attention was then focused on the proximal, larger fragment. An attempt was made to grasp the stent fragment with a snare, followed by a balloon catheter to drag the stent out of the bile duct. Both of these techniques, however, were unsuccessful. Rat-tooth forceps were then used to grasp the distal end of the fractured stent, which was cautiously withdrawn from the CBD (Figure 2). Subsequent cholangiogram and endoscopic assessment of the upper gastrointestinal tract showed no evidence of procedure-related trauma or other complications. The patient was discharged in stable condition and outpatient follow-up was scheduled.

DISCUSSION

Biliary stents are used to manage benign and malignant obstruction by enabling biliary drainage and decompression, alleviate patient symptoms and improve quality of life. The choice of metal or plastic stent depends on the etiology of the obstruction (1,2). Stent occlusion and stent migration are the most common complications of plastic biliary stent insertion, whereas cholecystitis, cholangitis, pancreatitis, perforation and bleeding are less common (3).

Metallic stents are preferred over plastic stents in malignant obstruction when life expectancy is anticipated to be longer than three to six months because they have significantly longer patency. Covered removable SEMS are a newer type of metal stent that may be preferred over plastic stents in benign biliary tract disease when a longer duration of stent insertion time is expected, as in benign bile duct strictures and biliary flow inertia. These stents can be lined with silicone, polyether polyurethane, polyurethane or expanded polytetrafluoroethylene fluorinated ethylene propylene to improve patency and facilitate removal (4,5).

Figure 1) Covered self-expandable biliary metal stent after removal. The arrow indicates the fracture site

Figure 2) Fluoroscopy image during stent removal showing rat-tooth forceps grasping the distal end of the fractured stent (arrow)

Stent fracture is an extremely rare complication and has only been described in a few case reports (6-8).

In the present case, we reported a rare complication of a fracture of an SEMS during an attempt to remove it after successful resolution of the patient's chronic biliary tract stasis. To our knowledge, the present report is the first to describe the fracture of a covered biliary metal stent with successful removal in two steps using rat-tooth forceps.

¹Department of Medicine, McMaster University, Hamilton; ²Department of Gastroenterology, Sunnybrook Health Science, Toronto, Ontario

Correspondence: Dr Lawrence Cohen, Department of Gastroenterology, Sunnybrook Health Sciences Centre, 2075 Bayview Avenue, HG-63, Toronto, Ontario M4N 3N5. Telephone 416-480-4725, fax 416-480-5977, e-mail lawrence.cohen@sunnybrook.ca

Received for publication June 21, 2014. Accepted July 1, 2014

REFERENCES

1. Chun HJ, Kim ES, Hyun JJ, Kwon YD, Keum B, Kim CD. Gastrointestinal and biliary stents. *J Gastroenterol Hepatol* 2010;25:234-5.
2. Lammer J, Hausegger KA, Flückiger F, et al. Common bile duct obstruction due to malignancy: Treatment with plastic versus metal stents. *Radiology* 1996;201:167-72.
3. Catalano O, De Bellis M, Sandomenico F, et al. Complications of biliary and gastrointestinal stents: MDCT of the cancer patient. *AJR Am J Roentgenol* 2012;199:W187-96.
4. Yoon WJ, Ryu JK, Yang KY, et al. A comparison of metal and plastic stents for the relief of jaundice in unresectable malignant biliary obstruction in Korea: An emphasis on cost-effectiveness in a country with a low ERCP cost. *Gastrointest Endosc* 2009;70:284.
5. Isayama H, Komatsu Y, Tsujino T, et al. A prospective randomised study of covered versus uncovered diamond stents for the management of distal malignant biliary obstruction. *Gut* 2004;53:729-34.
6. Sriram PV, Ramakrishnan A, Rao GV, Nageshwar Reddy D. Spontaneous fracture of a biliary self-expanding metal stent. *Endoscopy* 2004;36:1035-6.
7. Yoshida H, Mamada Y, Tani N, et al. Fracture of an expandable metallic stent placed for biliary obstruction due to common bile duct carcinoma. *J Nippon Med Sch* 2006;73:164-8.
8. Rasmussen IC, Dahlstrand U, Sandblom G, Eriksson LG, Nyman R. Fractures of self-expanding metallic stents in periampullary malignant biliary obstruction. *Acta Radiol* 2009;50:730-7.

The Canadian Journal of Gastroenterology & Hepatology is now considering a limited number of submissions for IMAGE OF THE MONTH. These are based on endoscopic, histological, radiological and/or patient images, which must be anonymous with no identifying features visible. The patient must consent to publication and the consent must be submitted with the manuscript. All manuscripts should be practical and relevant to clinical practice, and not simply a case report of an esoteric condition. The text should be brief, structured as CASE PRESENTATION and DISCUSSION, and not more than 700 words in length. A maximum of three images can be submitted and the number of references should not exceed five. The submission may be edited by our editorial team.