

Potentially fatal haemobilia due to inappropriate use of an expanding biliary stent

Rakesh Rai, John Rose, Derek Manas

Rakesh Rai, Derek Manas, Hepatobiliary Surgery and Liver Transplant Unit, Freeman Hospital, Newcastle, UK

John Rose, Department of Interventional Radiology, Freeman Hospital, Newcastle, UK

Correspondence to: Mr. Rakesh Rai, Flat-2, 108 St. Georges Terrace, Jesmond, Newcastle, NE22DP, UK. rai2000@hotmail.com

Telephone: +44-191-2818326

Received: 2003-05-12 **Accepted:** 2003-08-19

Abstract

AIM: To highlight the fatal complication caused by expanding biliary stents and the importance of avoiding use of expanding stent in potentially curable diseases.

METHODS: Arterio-biliary fistula is an uncommon cause of haemobilia. We describe a case of right hepatic artery pseudoaneurysm causing arterio-biliary fistula and presenting as severe malena and cholangitis, in a patient with a mesh metal biliary stent. The patient had lymphoma causing bile duct obstruction.

RESULTS: Gastroduodenoscopy failed to establish the exact source of bleeding and hepatic artery angiography and selective embolisation of the pseudo aneurysm successfully controlled the bleeding.

CONCLUSION: Bleeding from the pseudo aneurysm of the hepatic artery can be fatal. Mesh metal stents in biliary tree can cause this complication as demonstrated in this case. So mesh metal stent insertion should be avoided in potentially benign or in curable conditions. Difficulty in diagnosis and management is discussed along with the review of the literature.

Rai R, Rose J, Manas D. Potentially fatal haemobilia due to inappropriate use of an expanding biliary stent. *World J Gastroenterol* 2003; 9(10):2377-2378

<http://www.wjgnet.com/1007-9327/9/2377.asp>

INTRODUCTION

With increasing surgical and radiological intervention in the liver and biliary tree, incidence of haemobilia is on the rise. The mesh metal stent insertion can cause haemobilia as described. Thus inappropriate use of mesh metal stents in potentially curable diseases should be avoided.

The diagnosis of haemobilia may be difficult to establish and the bleeding may be fatal. Pseudoaneurysm of the right hepatic artery is an uncommon cause of haemobilia. A proper facility for radiological and surgical intervention is important to achieve success in control of bleeding.

The presentation and management of a case of haemobilia in a patient with mesh metal stent is described.

CASE REPORT

A 47-year-old lady was referred as an emergency from another

hospital with recurrent cholangitis and severe malena.

Two years previously she had presented in the referring hospital with an abdominal mass, vomiting and obstructive jaundice. Further investigation including computed tomography (CT) scan of the abdomen was inconclusive. A laparotomy was carried out which revealed a large nodular mass in the abdomen causing gastric outlet obstruction and compression at the porta hepatis. It was not possible to resect this mass and because there were extensive small bowel adhesions, an enteric or biliary surgical bypass was not considered a safe option. A sample from the lesion was taken for histology.

Postoperatively the patient underwent percutaneous placement of a self expanding mesh metal stent in her bile duct to relieve the jaundice. Histology suggested the presence of a non-Hodgkin's lymphoma. Radiotherapy and chemotherapy were commenced, which produced a very good response. The patient was asymptomatic for 6 months and during that time a repeated CT scan showed no evidence of intra-abdominal diseases. Six months later the patient presented with obstructive jaundice and ultrasound examination suggested occlusion of the metal stent. On endoscopy the metal stent was protruding into the duodenum, which was associated with duodenal ulceration. A plastic stent was inserted through the metal stent at ERCP.

After a few months the patient developed further cholangitis and had severe malena leading to referral to our unit.

On arrival the patient had symptoms and signs suggestive of cholangitis. The patient was pale and required blood transfusion and was started on antibiotics for cholangitis. After resuscitation, endoscopy examination showed ulcerations in the 2nd part of duodenum adjacent to the metal stent but no active bleeding. On the 2nd day the patient developed more severe malena and it necessitated laparotomy to control the bleeding. At laparotomy there was an inflammatory mass around the porta, and the common bile duct was adherent to the hepatic artery and portal vein. During dissection the common bile duct was entered inadvertently and the blocked plastic stent was therefore removed. As soon as the plastic stent came out, profuse bleeding occurred inside the common bile duct. The source of this bleeding was unclear. As it was impossible to control the bleeding coming from the bile duct urgent on table, hepatic angiography was performed via the right femoral artery. It showed a pseudo-aneurysm of the right hepatic artery which had ruptured into the common bile duct. A successful embolisation of the right hepatic artery aneurysm was carried out. A T-tube was placed in the common bile duct. Within 24 hours of surgery, percutaneous drainage of the obstructed biliary tree was achieved with an external-internal drain. The patient recovered from surgery with no further malena. The biliary drain was internalised using a plastic stent, T-tube was removed prior to discharge.

Over the fourteen months since laparotomy and embolisation of the right hepatic artery pseudo-aneurysm, the patient has been asymptomatic, the biliary drain has remained patent and a recent CT scan showed no evidence of residual lymphoma.

DISCUSSION

Haemobilia is an uncommon cause of gastrointestinal bleeding

and currently the most common cause of haemobilia in the Western world is as a consequence of percutaneous liver procedures. In a recent review of 222 cases of haemobilia, 147 were iatrogenic in aetiology following hepatobiliary intervention^[1]. The origins of haemobilia might be diverse and included the cystic artery, anomalous hepatic artery, and hepatic artery to portal vein fistulas^[2,3]. One of the reported causes of haemobilia was pseudoaneurysm of the hepatic artery, and the most common causes of this include laparoscopic cholecystectomy, exploration of the bile duct and other surgical biliary procedures.

Aneurismal disease of the hepatic artery from any cause is rare. Different authors have identified 21 % to 44 % of all splanchnic artery aneurysms as occurring in the hepatic artery^[4,5]. Causes included arteriosclerosis (30-50 %), medial degeneration (25 %), trauma (20 %), mycotic infection (10 %), and congenital disorders (15 %)^[3]. Eighty percent of hepatic artery aneurysms are extra hepatic and 20 % are intrahepatic. Extra hepatic aneurysms are distributed in the common hepatic artery (60 %), the right hepatic artery (30 %), the left hepatic artery (5 %), and rarely, in both (4 %).

In the present case, the severe bleeding on table was precipitated by removal of the plastic stent from the bile duct. The inflammation surrounding the bile duct and the presence of adhesions between the metal stent and the hepatic artery may have contributed to the formation of the pseudo-aneurysm of the right hepatic artery which was adherent to the metal stent. The previous episodes of malena probably indicated intermittent bleeding from the pseudoaneurysm, which was partially occluded by the plastic stent.

Thus mesh metal stent insertion can lead to this fatal complication. The most important aspect of this case is that the mesh metal stent was inserted before the response to radiotherapy and chemotherapy. The patient had no evidence of residual lymph node after therapy. Thus a long term mesh metal stent was unnecessary and could have been avoided.

The best treatment option for an occluded metal stent is not clear. The options are placement of a new coaxial metal stent, mechanical cleaning of the blocked stent or coaxial insertion of a plastic stent^[6]. In a multicentric study of treatment of an occluded mesh metal stent due to tumour overgrowth, all the three methods were found to be equally effective but insertion of a plastic stent within a mesh metal stent appeared to be the most cost effective method^[6].

Diagnosing haemobilia can be difficult. Haemobilia can present as upper or lower GI bleeding and the first investigation should be upper gastrointestinal tract endoscopy. If blood is seen coming from the ampulla of Vater, haemobilia is the likely cause of bleeding. But as few as 12 percent of these endoscopies might be diagnostic^[7]. Due to intermittent bleeding from the biliary tree the source of bleeding may not be apparent. In a series of 29 patients with haemobilia, 22 patients had a normal endoscopy^[8]. In our case as well the bleeding was not seen coming from the ampulla of Vater at the time of endoscopy and in the presence of duodenal ulceration due to the protruding metal stent, the cause of gastrointestinal bleeding was presumed to be duodenal ulcerations.

The choice of further investigation has varied over the years. Goodnight and Blaisdell^[9] in 1981 recommended computed tomography (CT) and then angiography. But now angiography is recognised as the investigation of choice after gastrointestinal endoscopy, as it can be diagnostic as well as therapeutic.

Angiography could be expected to detect a vascular abnormality in over 90 % of cases of significant haemobilia^[1]. Angiography can not only demonstrate pseudo-aneurysm of the arteries but also demonstrate arterio-biliary and arterio-

portal fistulas.

Once the diagnosis of haemobilia is established, the aim is to stop the bleeding. It is important to correct any coagulopathy if present. The bleeding might stop on conservative treatment depending on the cause of bleeding. In a recent review of 171 cases of haemobilia, 73 (43 %) patients required only conservative treatment^[1]. In case of continued bleeding, transarterial embolisation has been shown to be successful in 80 % to 100 % of cases^[10-14]. Since the reported morbidity and mortality rates of transhepatic arterial embolisation (TAE) were lower than surgery^[14], angiographic embolisation should be attempted first. The relative contraindication of arterial embolisation is hepatic sepsis, and in case of portal vein obstruction, arterial embolisation can cause hepatic necrosis.

Surgery is indicated if embolisation has failed or in case of hepatic sepsis. Adequate drainage of the biliary tree by endoscopic, percutaneous route or by surgery is important.

In conclusion, mesh metal stent insertion in the biliary tree can lead to fatal haemobilia. The diagnosis and management of haemobilia can be difficult and need an experienced multi-disciplinary team - mainly hepatobiliary surgeons, endoscopists and interventional radiologists. To avoid this complication unnecessary use of a mesh metal biliary stent in potentially curable diseases should be avoided.

REFERENCES

- 1 **Green MH**, Duell RM, Johnson CD, Jamieson NV. Haemobilia. *Br J Surg* 2001; **88**: 773-786
- 2 **Strickland SK**, Khoury MB, Kiproff PM, Raves JJ. Cystic artery pseudoaneurysm: a rare cause of hemobilia. *Cardiovasc Intervent Radiol* 1991; **14**: 183-184
- 3 **Fagan EA**, Allison DJ, Chadwick VS, Hodgson HJ. Treatment of haemobilia by selective arterial embolisation. *Gut* 1980; **21**: 541-544
- 4 **Salam TA**, Lumsden AB, Martin LG, Smith RB. Nonoperative management of visceral aneurysms and pseudoaneurysms. *Am J Surg* 1992; **164**: 215-219
- 5 **Miani S**, Arpesani A, Giorgetti PL, Rampoldi V, Giordanengo F, Ruberti U. Splanchnic artery aneurysms. *J Cardiovasc Surg* 1993; **34**: 221-228
- 6 **Tham TCK**, Carr-Locke DL, Vandervoort J, Wong RCK, Lichtenstein DR, Van Dam JV, Ruymann F, Chow S, Bosco JJ, Qaseem T, Howell D, Pleskow D, Vannerman W, Libby ED. Management of occluded biliary Wallstents. *Gut* 1998; **42**: 703-707
- 7 **Counihan TC**, Islam S, Swanson RS. Acute cholecystitis resulting from hemobilia after tru-cut biopsy: a case report and brief review of the literature. *Am Surg* 1996; **62**: 757-758
- 8 **Moodley J**, Singh B, Laloo S, Pershad S, Robbs JV. Non-operative management of haemobilia. *Br J Surg* 2001; **88**: 1073-1076
- 9 **Goodnight JE Jr**, Blaisdell FW. Hemobilia. *Surg Clin North Am* 1981; **61**: 973-979
- 10 **L' Hermine C**, Ernst O, Delemazure O, Sergeant G. Arterial complications of percutaneous transhepatic biliary drainage. *Cardiovasc Intervent Radiol* 1996; **19**: 160-164
- 11 **Horak D**, Guseinov E, Adamyan A, Titova M, Danilov M, Trostenyuk N, Voronkova O, Gumargalieva K. Poly (2-hydroxyethyl methacrylate) particles for management of hemorrhage of complicated origin: treatment of hemobilia. *J Biomed Mater Res* 1996; **33**: 193-197
- 12 **Doussset B**, Sauvanet A, Bardou M, Legmann P, Vilgrain V, Belghiti J. Selective surgical indications for iatrogenic hemobilia. *Surgery* 1997; **121**: 37-41
- 13 **Yoshida J**, Donahue PE, Nyhus LM. Hemobilia: review of recent experience with a worldwide problem. *Am J Gastroenterol* 1987; **82**: 448-453
- 14 **Richardson A**, Simmons K, Gutmann J, Little JM. Hepatic haemobilia: non-operative management in eight cases. *Aust N Z J Surg* 1985; **55**: 447-451