Hepatic artery pseudoaneurysm formation following intraductal biliary radiofrequency ablation

A 73-year-old man with a history of liver transplantation developed cholestasis. No abnormality was seen on magnetic resonance imaging. Percutaneous cholangioscopy via a left-sided transhepatic tract (● Fig. 1) demonstrated carpet-like villose change with biopsies showing high-grade dysplasia in the right and left ducts. Intraductal ultrasound (IDUS) showed a T1 lesion, with bile duct wall thickening to 2.4 mm. Radiofrequency ablation (RFA) was performed in the right and left hepatic ducts with an 8-French catheter (Habib EndoHPB, EMcision, Montreal, Canada) at 10W for 90 seconds. Sixteen days later the patient presented with melena, requiring transfusion of 6 units packed red blood cells. Angiography showed a 1.2-cm pseudoaneurysm of the right hepatic artery, which was thrombosed with percutaneous thrombin injection. Subsequent cholangioscopy demonstrated successful ablation of the biliary dysplasia (● Fig. 1). The close temporal relationship of RFA to pseudoaneurysm formation, and the absence of other apparent etiologies, implicate intraductal RFA as the likely cause. RFA may be used to treat cholangiocarcinoma [1, 2] and intraductal extension of ampullary polyp [3]. The cross-sectional diameter of the RFA tissue ablation zone varies from 4.3 to 11.3 mm depending on the power and duration of treatment [4]. These values are probably underestimates, since they are based on ex-vivo experiments and do not take into account delayed tissue necrosis. We hypothesize that RFA induced necrosis of the bile duct wall and a portion of adjacent right hepatic artery, leading to pseudoaneurysm formation with subsequent rupture into the right hepatic duct. The right hepatic artery may focally approach within 1 mm of the bile duct wall [5]. We now utilize IDUS immediately prior to RFA, and avoid performing RFA at 10W wherever a vessel passes within 4 mm of the IDUS probe (● Fig. 2). However, when a closely approximating vessel cannot be avoided, we decrease the RFA energy setting.

Fig. 1 Right hepatic duct dysplasia treated by intraductal biliary radiofrequency ablation: a cholangiogram before treatment shows poor filling of the right hepatic duct; b cholangioscopy of the right hepatic duct shows sessile polyp; c follow-up cholangioscopy of the right hepatic duct after treatment shows successful ablation of the polyp.

Fig. 2 Intraductal ultrasound (IDUS) guides radiofrequency ablation (RFA) in a patient with hilar cholangiocarcinoma and recurrent stent occlusion: a IDUS probe (arrow) positioned at the proximal edge of a right hepatic biliary stent; b IDUS image at the same location shows the right hepatic artery approaching within 2.6 mm of the IDUS probe, with echogenic ends of the metal stent wires also visible; c RFA was performed within the stent (arrow), avoiding the location shown in a and b.

Competing interests: None
M. Topazian¹, M. J. Levy¹, S. Patel², M. R. Charlton¹, T. H. Baron¹

¹ Division of Gastroenterology and Hepatology, Department of Internal Medicine, Mayo Clinic, Rochester, Minnesota, USA
² Department of Radiology, Franciscan All Saint’s Hospital, Racine, Wisconsin, USA

References

3 Dzeletovic I, Topazian MD, Baron TH. Endoscopic balloon dilation to facilitate treatment of intraductal extension of ampullary adenomas (with video). Gastrointest Endosc 2012; 76: 1266 – 1269

Bibliography

DOI http://dx.doi.org/10.1055/s-0032-1326644
Endoscopy 2013; 45: E161–E162
© Georg Thieme Verlag KG Stuttgart · New York
ISSN 0013-726X

Corresponding author

M. Topazian, MD
Mayo Clinic
200 First St. SW
Rochester
MN 55905
USA
Fax: +1-507-266-3939
topazian.mark@mayo.edu

Topazian M et al. Hepatic artery pseudoaneurysm formation following intraductal biliary radiofrequency ablation... Endoscopy 2013; 45: E161–E162