



Hepatolithiasis caused by right hepatic artery branches forming an arterial ring compressing the common hepatic duct.



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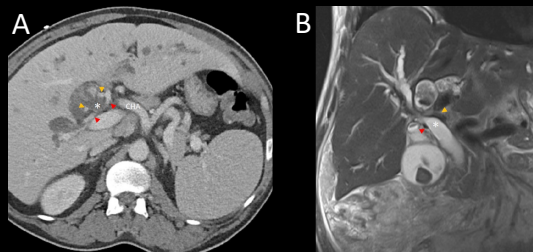
Introduction

Anatomic variants of the hepatic artery are common, but are generally of no physiologic significance. We present a patient with an early branching of the right hepatic artery (RHA), wherein the right anterior and right posterior sectoral arteries encircled and compressed the CHD, resulting in proximal hepatolithiasis.

Case Description/Methods

A healthy 51-year-old male presented with abdominal pain, jaundice and fever. Computed tomography of the abdomen showed bilateral intrahepatic duct stones and a focal CHD stricture near its bifurcation. At endoscopic retrograde cholangiopancreatography, the stricture was dilated and a plastic biliary stent was inserted. Since the hepatolithiasis could not be cleared endoscopically, surgical common bile duct exploration was performed.

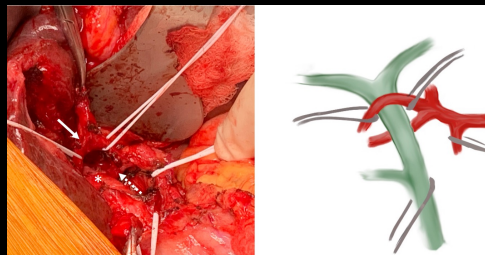
At laparotomy, we identified an early bifurcation of the RHA. The right anterior artery crossed anterior to the CHD, whereas the right posterior artery coursed posterior to the CHD. These arterial branches were densely adherent to and circumferentially constricting the CHD. We performed an arterial divestment to release the anterior and posterior RHA branches from the CHD. We transected the CHD 1cm distal to its bifurcation and transposed the anterior RHA branch posterior to the CHD. We used intraoperative cholangioscopy to guide clearance of the hepatolithiasis and to evaluate the biliary epithelium. The CHD was reconstructed in an end-to-end fashion over plastic biliary stents. The patient had an uneventful postoperative course. Post operative ERCP demonstrated no evidence of biliary stricture. A small amount of residual stone debris was cleared. The patient remains asymptomatic to date.



Axial CT (A) and coronal MRI (B) showing the right anterior (orange arrowheads) and right posterior (red arrowheads) hepatic arteries encircling the common hepatic duct (white asterisk).



Post operative ERCP demonstrating normal biliary anatomy after clearance of mild residual stone debris within the intrahepatic ducts.



Relationship between the common hepatic duct (asterisk) and the mobilized anterior (solid arrow) and posterior (dotted arrow) right hepatic artery branches.

Discussion

This case illustrates a rare but clinically important phenomenon of CHD compression within an arterial ring formed by the anterior and posterior sectoral branches of an early branching RHA. Tsuchiya *et al.* reported the first case of CHD compression caused by an anterior-crossing RHA, and coined this entity the “right hepatic artery syndrome”. Since then, 10 additional cases of CHD compression caused by topographical variants of the hepatic artery have been described. Most patients underwent surgery for bile duct exploration and bilio-enteric drainage, or to release the artery from the CHD. Both surgical approaches provide a high rate of durable symptom resolution. In recent years, there have been reports describing purely endoscopic management of this condition using ERCP or direct cholangioscopy to clear intrahepatic stones.