

CASE PRESENTATION

Unusual Biliary
Anatomy at ERCP

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A previously fit and well 84-year-old patient presented with new onset obstructive jaundice to his general practitioner. On referral to hospital his blood tests showed a bilirubin rise of 101 (normal range - 17.00 $\mu\text{mol/l}$), an Alkaline phosphatase of 205 iu/L (30-150) and an Alt of 47 iu/L (- 35). A transabdominal ultrasound showed a shrunken gall bladder with at least three small stones but poor views of the common bile duct (CBD). A CT scan was therefore ordered which showed unusual anatomy consisting principally of two long hepatic ducts coursing down to the duodenum and joining just proximal to the ampulla to form a very short CBD. (Figure 1 & 2). The right hepatic duct was dilated to 19 mm and the left hepatic duct to 17 mm; both ducts contained soft tissue densities in the mid to distal portions. In the region where the two ducts unite, there was a further 19 mm soft tissue density immediately superior to the ampulla. An ERCP was ordered on the suspicion that these intraductal lesions were CBD stones.

At ERCP the two ducts were visualized sequentially after cannulation by cholangiography beginning with the left duct.

Omnipaque 240 mg diluted to 50/50 (5 ml contrast + 5 ml normal saline) was the contrast used for cholangiography. The left hepatic duct was cannulated and opacified first as seen in Figure 3. An FS-OMNI-35 sphincterotome, preloaded with .035" guide wire for cannulation of the first duct (right on the X-Ray), was incorporated; following sphincterotomy, the duct was cleared using an FS-QEB-XL-A extraction balloon (12 mm, 15 mm, 18 mm & 20 mm diameter). The right system was challenging to access, given the altered anatomy. The Fusion OMNI 21, preloaded with .021" guide wire, was used to cannulate the duct and stones were removed with the same extraction balloon. The procedure was completed with all stones cleared from both ducts. After balloon trawls of each duct, a balloon occlusion cholangiogram confirmed that the procedure was complete for each duct in turn.

Discussion: Biliary and pancreatic duct anatomical variations are commonly reported at radiology though may not always be seen at ERCP. A variety of anomalies have been reported. The most common concerns the drainage of the right posterior duct (RPD) into the left hepatic duct (LHD) before its confluence with the right anterior duct (RAD). Another reported anomaly describes simultaneous emptying of the RPD, RAD and LHD into the common hepatic duct (CHD) leading into a "triple confluence." Three common variants of the cystic duct are described, such as the low cystic duct insertion into the distal extra hepatic bile duct (EHD); the medial cystic duct insertion, in which the cystic duct drains into the left side of the CHD and a parallel course of the cystic duct with the CHD, where the cystic duct runs closely parallel to the CHD for around 20 mm prior to insertion. The anatomical variation described here is rare. Clinical recognition of these variations is important in recognizing the different ducts present not only for ERCP but in other arenas, for example during hepatobiliary surgery or laparoscopic cholecystectomy.

Figure 1
Axial CT image showing dilated left (black arrow) and right (white arrow) hepatic ducts, both containing gallstones.

Figure 2
Sagittal reconstructed CT image showing dilated left anterior (black arrow) and right posterior (white arrow) hepatic ducts, both containing gallstones, above a duodenal diverticulum.

Figure 3
Cholangiogram during ERCP demonstrating two long hepatic ducts which merge to form a short common bile duct at the ampulla. The cystic duct comes off from the mid right hepatic duct.

