Case report

A 45-year-old woman presented for an elective laparoscopic cholecystectomy following resolution of an episode of acute cholecystitis. She had well-controlled hypertension and diabetes. Her vital signs were unremarkable and an ultrasound scan confirmed cholelithiasis as the only abnormality.

At surgery, a fibrotic shrunken gallbladder was found. During the dissection of Calot’s triangle, the cystic duct was seen to disappear behind a ‘blue’ tubular structure that was traced inferiorly and seen to run anterior to the first part of the duodenum and then disappear into the retroperitoneum. The uncertainty of the anatomy resulted in the operation being converted to an open procedure. A Kocher incision was made and the finding of a preduodenal portal vein confirmed (Fig. 1). A cholecystectomy was performed. No other abnormalities of the foregut were identified. The patient subsequently made an uneventful recovery apart from minor wound sepsis.

Discussion

Preduodenal portal vein (PDPV) is a rare congenital anomaly first described in 1912 by Begg in a pig embryo. In 1921 Knight described this anomaly in a human for the first time, having seen it during an autopsy, and in 1926 Schnitzler was the first to operate on a case of duodenal obstruction caused by a PDPV. An understanding of the embryological development of the portal vein is essential in understanding how this anomaly may arise.

Summary

Variations of biliary anatomy are well described. Those of most relevance to the operative surgeon are the variations of the extrahepatic ducts and their relationships to the right hepatic artery and its branches. We describe another even rarer congenital anomaly of a preduodenal portal vein. Its embryological derivation and presentation are discussed to heighten awareness of its recognition and reduce the potential of a serious operative misadventure.
Duodenal anastomosis remains patent, resulting in a pre-duodenal position of the portal vein, or the portal vein develops normally but an associated malrotation of the foregut, e.g. situs inversus of the stomach and the duodenum, can result in a PDPV.

In our case there was no evidence of malrotation, so the pre-duodenal portal vein (PDPV) is most likely to have developed by means of the former process.

In 1974, Braun et al. reviewed the literature and found only 41 reported cases of PDPV from 1921 to 1974. Of those reported, 27 were in children younger than 10 years of age and 12 were in adults. In 2 cases the ages were unknown. Thirty-four (83%) of these cases were associated with other multiple congenital malformations. Intestinal malrotation was associated with 80% of these cases, situs inversus with 40%, pancreatic malformations with 33%, and biliary atresia, duodenal stenosis or atresia with 13%. In the majority of these cases it was the associated malformation and not the PDPV that was the primary reason for operative intervention.

Ishizaki et al. reviewed 11 cases, of which 6 were reported after Braun’s 1974 review. Of these new cases, 4 had associated congenital anomalies; only one was symptomatic and presented with duodenal stenosis.

Other rare and interesting presentations of PDPV have been described. Snively and Breakell reported a patient with portal hypertension secondary to stenosis of a PDPV. This patient died from bleeding oesophageal varices. Bernard et al. reported a case with dual complications. This patient had duodenal stenosis and an anterior duodenal ulcer that penetrated the portal vein causing a massive upper gastrointestinal haemorrhage.

PDPV usually presents in the paediatric population as it is the associated congenital anomalies that draw attention to its presence. In adults it is usually asymptomatic and is an incidental finding at elective surgery for an unrelated condition.

As rare as PDPV may be, the surgeon has to be aware of its possible presence as injury to the portal vein can result in disastrous consequences. In our patient we resorted to open surgery, and we believe this to be the safest approach to delineate the abnormality and avoid inadvertent portal vein injury.

REFERENCES