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BRIEF REPORT

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Laparoscopic cholecystectomy injury: an unusual indication for liver transplantation

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Abstract The introduction of laparoscopic cholecystectomy has been associated with a rise in the number of reported bile duct injuries (0.3%–0.8%). Significant vascular injuries are rare (0.16%), but may lead to life-threatening complications. We present a case report of a patient undergoing transplantion for a laparoscopic cholecystectomy injury.

Key words Laparoscopic cholecystectomy, bile duct injury, liver transplantation · Bile duct injury, laparoscopic cholecystectomy, liver transplantation · Liver transplantation, laparoscopic cholecystectomy, bile duct injury

Introduction

Bile duct injury is reported to occur in 0.3%–0.8% of patients after laparoscopic cholecystectomy [7, 8, 16] and in 0.06% after open cholecystectomy [7], and it is the most common major complication of laparoscopic cholecystectomy [14]. Vascular injury to portal vessels is reported to occur in 0.16% of laparoscopic cholecystectomies and can lead to life-threatening complications [6]. We report a case of porta hepatis injury following laparoscopic cholecystectomy that resulted in secondary biliary cirrhosis and ultimately required liver transplantation.

Case report

A 40-year-old woman underwent elective laparoscopic cholecystectomy, which was complicated by bleeding and required conversion to laparotomy. Fourteen days later she developed abdominal distension, and ultrasound demonstrated free intraperitoneal fluid and dilated intrahepatic ducts. The following day she underwent laparotomy for biliary peritonitis. At this time the common bile duct (CBD) was not identified, but the hepatic artery and portal vein were felt to be intact. She was referred for further management.

Percutaneous transhepatic cholangiogram demonstrated transection of the common hepatic duct and CT scan showed infarction of segment V and patchy necrosis of the left lobe of the liver. Laparotomy confirmed these findings, but the hepatic artery and extrahepatic bile ducts could not be identified. Segment V was debrided and drains were inserted to control the biliary fistula. Subsequent angiography showed an occluded common hepatic artery and a clip on the left branch of the portal vein. The postoperative period was complicated by sepsis and acute liver failure. Liver transplantation (OLT) was discussed at this stage but it was felt that conservative management could be continued. The patient recovered from acute liver failure but required prolonged hospitalisation with sepsis and a biliary fistula.

The patient was discharged 5 months postoperatively, but a month later was readmitted with jaundice (serum bilirubin 114 μmol/l, normal 3–20 μmol/l) and raised alkaline phosphatase (464 IU/l, normal 30–120 IU/l) and aspartate aminotransferase (AST; 130 IU/l, normal 10–50 IU/l). Ultrasound demonstrated right and left bile duct dilatation and bile cultures grew *Pseudomonas*. Laparotomy revealed an atrophic left liver, absent left branch of the portal vein and a cavity within the liver extending from the porta hepatis. A Roux loop was anastomosed to the cavity entrance forming a "hepato-jejunostomy".

One year after her original operation the patient became progressively jaundiced with intractable pruritus and poor synthetic function; liver biopsy revealed secondary biliary cirrhosis. Angiography demonstrated a fine network of collateral vessels running up to the porta hepatis with varices. The patient underwent transplantation 20 months following laparoscopic cholecystectomy. There were dense adhesions and a large abscess of the right lobe of the liver. OLT was performed with venovenous bypass and arterial reconstruction was performed using an infrarenal iliac conduit. Four

days post-transplant, hepatic angiography performed for graft dysfunction revealed thrombosis of the arterial conduit. The patient underwent emergency retransplantation 4 days later with a new iliac artery conduit. Postoperatively she was anticoagulated with heparin for 3 weeks and then placed on aspirin. A retrohepatic haematoma was drained percutaneously and ganciclovir was required for cytomegalovirus infection. The patient made a good recovery and was discharged home at 8 weeks on cyclosporin, azathioprine and prednisolone. Apart from surgical revision of the hepatico-jejunostomy for an anastomotic biliary stricture, she remains well with normal liver function 27 months later.

Discussion

Major biliary injury is well recognised as a rare, but serious, complication following laparoscopic cholecystectomy. There has been a five-to-tenfold increase in the rate of bile duct injury with the introduction of laparoscopic cholecystectomy [4, 6, 8, 12, 14, 16, 18, 19]. Although initially blamed on a "learning curve", the trend continues [16] with a reported incidence of 0.7% in the West of Scotland [8] and 0.8% in the Netherlands [16], and few centres have avoided this complication [10]. Bile duct damage may result from inadvertent division, total or partial occlusion by clips [11] or from the use of diathermy [2] resulting in a high injury to the common bile duct or right hepatic duct. The role of operative cholangiography in protecting or at least recognising a duct injury has been debated [9, 14], but it continues to be performed by the minority of surgeons [6].

Major ductal injury accounts for a significant proportion of all biliary injuries [3] and is usually recognised at surgery, but some will present with postoperative biliary peritonitis. Hepatico-jejunostomy using a Roux-en-Y anastomosis is the treatment of choice to re-establish biliary drainage either at the time of injury or at a second operation [15]. If recognition of the injury is delayed, it may be preferable to control the bile leak with drains to allow acute inflammation and infection to settle, and to perform a hepatico-jejunostomy as an elective procedure [3].

Vascular injury at the time of laparoscopic cholecystectomy is not well described, but the consequences of such injuries have been reported [17]. Classically the injury is to the right hepatic artery (RHA) [13], but occasionally to the portal vein [6]. Ligation of the RHA resulting in right liver necrosis, sepsis and OLT has been described once [1]. Major ductal injury in combination with major vascular injury is potentially lethal, but fortunately rare [5, 13]. In this case the entire extrahepatic biliary tree and common hepatic artery were injured with a clip having been applied across the left branch of the portal vein, presumably at the original operation. This resulted in biliary peritonitis and ischaemic liver necrosis. Reasonable liver function was achieved for 1 year with drainage and subsequent "hepato-jejunostomy". Thereafter, gradual deterioration necessitated liver transplantation. In 1991, the prospect of liver transplantation for secondary biliary cirrhosis as a consequence of laparoscopic injury was raised [9], but we believe this is the first reported case in the United Kingdom.

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