Hepatic Artery Pseudoaneurysm Post Laparoscopic Cholecystectomy

Owain Davies*, Jeremy Batt, Rob Bethune and Edward Courtney
Department of General Surgery, Royal United Hospital Bath NHS Trust, United Kingdom

Abstract

A 73 year old lady with a 3 day history of lethargy, vomiting, shortness of breath and bleeding per rectum was admitted 4 weeks following a laparoscopic cholecystectomy. CT imaging revealed a haematoma in the right upper quadrant that was demonstrated to be secondary to a right hepatic pseudoaneurysm (HAP). This was successfully embolized with the patient making a full recovery.

HAP is a rare but potentially fatal complication of laparoscopic cholecystectomy. Several mechanisms are postulated to cause iatrogenic HAP formation with anatomical variation of the right hepatic artery a contributory factor. Early imaging in patients presenting with features of a bleed post laparoscopic cholecystectomy may prevent, potentially deadly, iatrogenic injury to a pseudoaneurysm if a laparoscopy is performed in the first instance.

ABBREVIATIONS

HAP: Hepatic Artery Pseudoaneurysm

CASE PRESENTATION

A 73-year-old lady was admitted under the medical team with a 3 day history of lethargy, vomiting, shortness of breath and intermittent bleeding per rectum. She had undergone a laparoscopic cholecystectomy at a different hospital 4 weeks earlier. Subsequently she had passed black stools intermittently since day 2 post-operatively. Examination revealed a diffusely tender abdomen with guarding over the epigastrium; bowel sounds were present. Plain abdominal and erect chest films revealed no abnormality. Haemoglobin was 55 g/dl and urea 18.4 on admission with a normal clotting profile.

The patient was resuscitated with intravenous fluids and a 4-unit blood transfusion, she was commenced on an pantoprazole infusion. Gastroscopy was attempted; however it was not possible to pass the scope beyond a large, 30mm diameter pharyngeal pouch. A CT abdomen and pelvis was performed revealing a heterogeneous, soft tissue mass, consistent with a haematoma adjacent to the surgical clips on the cystic duct and artery (Figure 1). A surgical opinion was sought which; in view of a suspected vascular injury during the previous operation, recommended a CT angiogram. This identified a hepatic artery pseudoaneurysm (HAP) with surrounding haematoma. Formal angiography demonstrated a right hepatic artery pseudoaneurysm and surrounding haematoma, with an anomalous origin of the right hepatic artery from the superior mesenteric artery (Figure 2). Embolization of the right hepatic artery was performed (Figure 3).

The patient made a full recovery and was discharged after 2 days.

DISCUSSION

HAP is a rare but potentially fatal complication of laparoscopic cholecystectomy that has been very rarely described in the literature. Rupture of HAP has a reported mortality of approximately 50%. The typical presentation of HAP is of right upper quadrant pain, haemobilia, intermittent jaundice and features of an upper gastrointestinal bleed. In the immediate post-operative period there may be increased bleeding from surgical drains. 80% of patient’s experiencing HAP from iatrogenic injury present within 4 weeks of their operation [1] although there is one report of a patient presenting 13 months post laparoscopic cholecystectomy [2].

The patient we described was unusual as she presented with lower gastro-intestinal bleeding and vomiting with no complaint of pain in the right upper quadrant on a background of intermittent melaena. Presumably the haematoma or pseudoaneurysm had eroded into some part of the gastro-intestinal tract, most likely the duodenum, explaining the symptoms. The presentation of rectal bleeding, low haemoglobin and raised urea, reasonably, led the medical team to initially investigate for an upper gastro-intestinal bleed. When gastroscopy was impossible a CT was helpful but not diagnostic. There was some debate about
Several mechanisms are postulated to cause HAP following laparoscopic cholecystectomy. Encroachment of clips on an adjacent vessel, diffusion of diathermy current via clips, bleeding from the stump of the cystic artery causing clot formation and subsequent vessel wall erosion are most convincing of all direct injury to the arterial wall. Anatomical variation of the right hepatic artery is a likely important cause of the latter. A study of 180 donor livers in Melbourne, Australia [3], reported that 75% of right hepatic arteries have the ‘normal’ origin from the common hepatic artery. In 18% of patients the right hepatic artery arises from superior mesenteric artery as in our patient (Table 1). Replaced hepatic arteries run posterior to the portal vein and bile duct in the free edge of the lesser omentum as opposed to the normal course where the artery lies medial to these structures. This discrepancy in the course likely increases the risk of an injury to the right hepatic artery at the time of surgery.

Treatment of HAP is usually by embolization of the pseudoaneurysm (collateral blood supply is provided by translobar vessels). This is occasionally not successful with surgical intervention being required; then the pseudoaneurysm is ligated or excised. Complications of treatment methods include; bleeding, infection and hepatic necrosis or infarction. Complications specific for embolization include: distal migration or dislodgement of coiling material, recanalization of the feeding vessel, coil erosion into the common bile duct and gallbladder fibrosis. Embolization is associated with 25% lower morbidity and mortality than surgical fixation [4].

**CONCLUSIONS**

This case highlights the importance of early arterial imaging prior to operating on patients with abdominal pain post laparoscopic cholecystectomy as opposed to diagnostic laparoscopy. An operative management strategy in this case may have led to further difficulty and potentially iatrogenic aneurysmal rupture. It is important to understand potential anatomical variations of the right hepatic artery as this may help prevent injury to vascular structures at the time of initial operation and make the prudent surgeon aware of potential pseudoaneurysm formation.

**REFERENCES**