Deranged liver function tests following laparoscopic cholecystectomy: What would Occam have to say?

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ABSTRACT

Postoperative complications can pose a significant obstacle in the ongoing management of surgical patients. However, it is pertinent to remember that postoperative events are not always complications of the preceding operation. We present the case of a patient with calculous cholecystitis and gallbladder empyema who underwent laparoscopic cholecystectomy. Postoperatively, he continued to have right upper quadrant pain associated with abnormal liver function tests. Ultimately, the cause of his postoperative symptoms was rather prosaic and ran counter to Occam's razor, the relevance of which is discussed below.

KEYWORDS

Gallstones – Laparoscopic cholecystectomy – Postoperative complications – Uncertainty

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Gallstones have a high prevalence among the adult population, with 1%–2% of previously asymptomatic individuals becoming symptomatic each year in the UK. Symptomatic gallstones disease may present as biliary colic, acute cholecystitis, complex biliary disease or gallstone pancreatitis.¹

We present the case of a patient with calculous cholecystitis and gallbladder empyema who underwent laparoscopic cholecystectomy and continued to have right upper quadrant (RUQ) pain associated with abnormal liver function tests postoperatively.

Case presentation

A 63-year-old man presented with a 3-day history of RUQ pain. The pain was initially colicky but then constant in nature, and was associated with nausea, anorexia and fever. The patient had no significant past medical history or drug history. There was no history of alcohol abuse.

On examination, the patient was febrile but not septic. Abdominal examination demonstrated RUQ tenderness, with a positive Murphy's sign but no signs of generalised peritonitis. The liver and gallbladder were not palpable. There was no jaundice clinically.

Initial blood tests revealed a white cell count (WCC) of $12.7 \times 10^9/L$ and a C-reactive protein (CRP) level of 82 mg/dL. Liver function tests were abnormal, with a bilirubin level of 54 $\mu\text{mol/L}$, an alanine aminotransferase (ALT) level of 1225 U/L and an alkaline phosphatase (ALP) level of 170 U/L.

Ultrasound (US) and computed tomography (CT) demonstrated a distended, thick-walled gallbladder and pericholecystic fat stranding. Gallstones were identified within the gallbladder. However, there were no stones in the common bile duct (CBD) and there was no biliary duct dilatation.

A diagnosis of acute cholecystitis was made and the patient underwent emergency laparoscopic cholecystectomy. The operation was technically challenging and revealed an empyema of the gallbladder with patchy gallbladder wall necrosis (Fig 1). Gallstones were found within the gallbladder. There were no intraoperative or immediate postoperative complications.

Postoperatively, the patient re-developed RUQ pain, with jaundice and a high spiking fever. There were associated increases in ALT, ALP and bilirubin levels (Fig 2). On abdominal US, there was a small collection within the gallbladder fossa measuring 25 × 11 × 13 mm, and mild (8 mm) dilatation of the CBD. WCC and amylase levels were normal throughout. CRP levels peaked at 190 mg/dL 2 days postoperatively.

Differential diagnoses at this point included: a bile leak with a gallbladder fossa collection; passage of a CBD stone with associated ascending cholangitis; or ischaemic hepatitis secondary to intraoperative damage to the hepatic blood supply. A further US and CT angiogram demonstrated a normal liver, a non-dilated biliary tree and no evidence of hepatic vascular damage or ischaemia. There was, however, a persistent gallbladder fossa collection.

Figure 1 Empyema of the gallbladder with patchy gallbladder wall necrosis

With no clear surgical explanation found, a full liver screen was sent. Serology for hepatitis A came back as positive. On further questioning, the patient reported having visited India several weeks earlier but opting not to be vaccinated for hepatitis A, having assumed that he was immune.

Discussion

The standard treatment for symptomatic gallstones is a laparoscopic cholecystectomy. Complications include biliary leak, infection, bleeding, bile duct injury and damage to the hepatic blood supply.

Occam’s razor is a well-known method within the medical literature for approaching diagnostic challenges. William of Occam put forward the notion that “entities must not be multiplied beyond necessity”. This is interpreted in medical terms as that we should search for one unifying diagnosis when a patient presents with multiple signs and symptoms. In turn, this should be the simplest explanation and require the least assumptions to fulfil it.²

More recently, John Hickam provided the counterargument to Occam. Hickam’s dictum states that “patients can have as many diseases as they damn well please”. Therefore, within diagnostics, multiple signs and symptoms may be due to multiple pathologies.²

Taking account this approach to diagnostic uncertainty, we feel that our case provides important learning points when approaching postoperative diagnostic challenges.

Figure 2 Liver function test results. Dotted lines represent upper limit of normal ranges for respective enzyme levels.

What would Occam say?

William of Occam would undoubtedly argue that postoperative signs and symptoms are most likely related to the preceding operation. This would be the simplest explanation requiring the least assumptions. In relation to the above case, explanations such as a postoperative collection or ischaemic hepatitis secondary to damage to the hepatic arteries would explain the patient's condition. This requires only one assumption: the laparoscopic cholecystectomy caused the postoperative events.

However, this case raises some important issues regarding this assumption. We maintain that this patient, in fact, presented with co-existing cholecystitis and hepatitis A, the latter of which became apparent only postoperatively.

Hepatitis A is an enterically transmitted infection more commonly seen in children in developing countries. It is often asymptomatic in children but commonly symptomatic in adults, with severe hepatitis associated with raised serum aminotransferases. In most cases, it is self-limiting.³

A review of the literature reveals few cases discussing the presentation of concurrent hepatitis A infection and acute cholecystitis. In all cases identified, the hepatitis A was associated with reportedly acalculous cholecystitis, although few were confirmed surgically. As a result, cholecystitis is reported as a rare complication of hepatitis. In all cases, patients presented with a primary diagnosis of hepatitis A and a secondary diagnosis of cholecystitis. These cases follow the principals of Occam's razor, in that they assume a causal relationship between hepatitis A infection and cholecystitis.^{3–5}

We challenge the conclusions of those previous case reports and instead suggest that they may be separate conditions presenting together. Patients can have both cholecystitis and hepatitis (if they damn well please). Cholecystitis is

common and, in certain areas of the world, hepatitis A is common. In concordance with Hickam's dictum, and as previously described by Mani et al, it is more likely that patients have two common disease, rather than one rare one.²

Conclusions

We feel this rare coexistence of pathology provides an important learning point when addressing what may be perceived as postoperative complications. It also highlights the necessity of taking a detailed travel history during the admission clerking.

It is important to review the full picture of the patient and not focus solely on one aspect. This is especially pertinent given today's aging population, where patients frequently present with multiple comorbidities. When addressing diagnostic dilemmas, it is therefore helpful to consider both Occam's razor and Hickam's dictum. In this case, we side with Hickam.

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