

## Case Report

# Ectopic Liver Encountered During Laparoscopic Cholecystectomy

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Ectopic liver is hepatic tissue that histologically resembles the mother tissue but is located at a site away from its usual location. Initially thought to be a rare anatomical anomaly of no clinical significance, it is now increasingly recognised to be capable of causing clinically relevant pathology. More specifically, it has been associated with a higher incidence of hepatocellular carcinoma, cholelithiasis and cholecystitis. Here, we report a case of ectopic liver encountered incidentally during laparoscopic cholecystectomy. [*Asian J Surg* 2007;30(3):227-9]

**Key Words:** choristoma, ectopic liver, heterotopic liver, laparoscopic cholecystectomy

## Introduction

Ectopic liver nodule, also known as heterotopic liver or choristoma, is hepatic tissue that histologically resembles the mother tissue but is located at a site away from its usual location. Initially thought to be a rare anatomical anomaly of no clinical significance, it is increasingly being recognised that it is capable of causing clinically relevant pathology. Importantly, it has been associated with a higher incidence of hepatocellular carcinoma (HCC), cholelithiasis and cholecystitis. This article reports a case of ectopic liver encountered incidentally during laparoscopic cholecystectomy.

## Case report

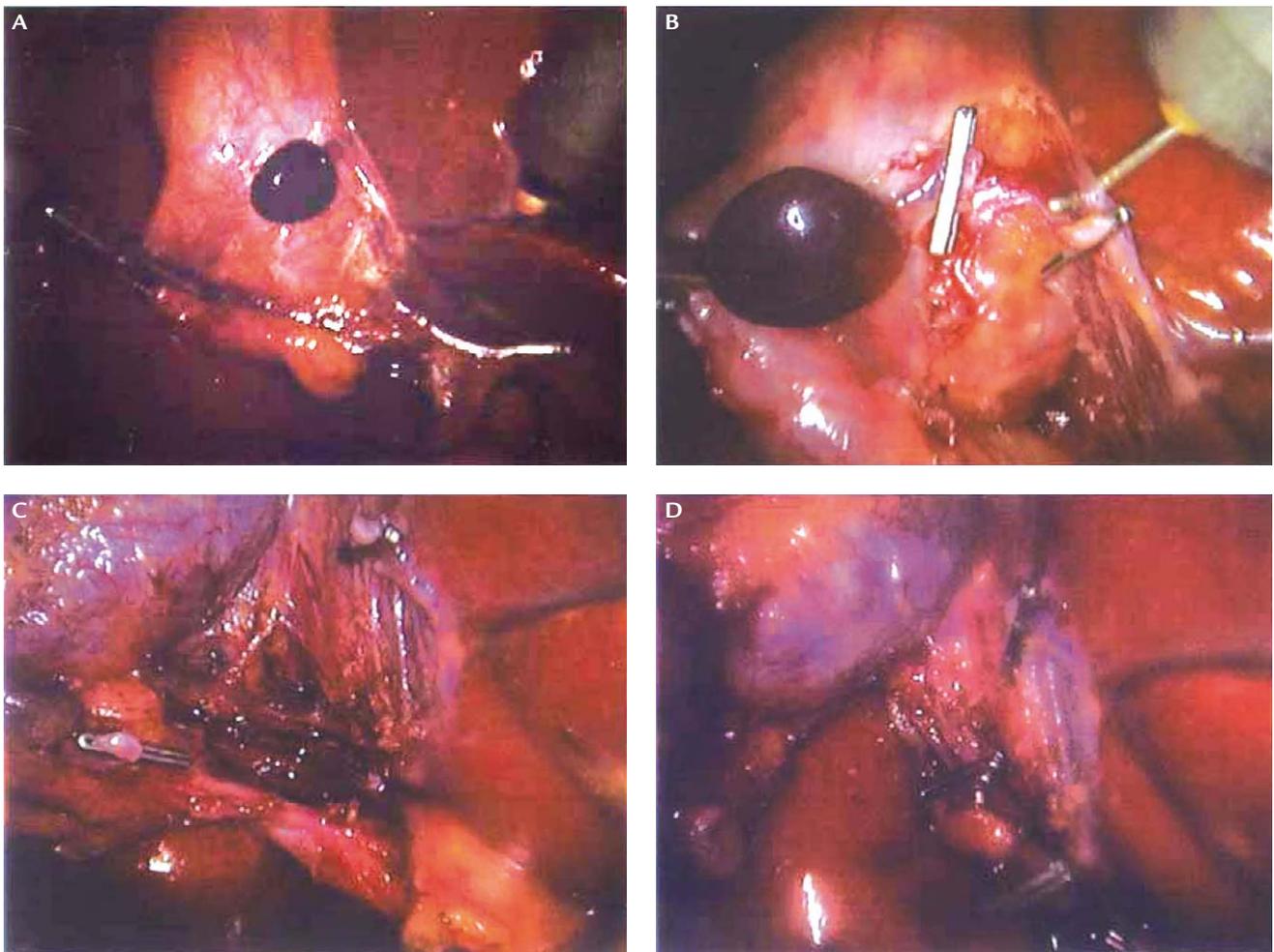
A 60-year-old woman presented with acute cholecystitis and underwent laparoscopic cholecystectomy. At the time of surgery, it was found that she had an ectopic liver nodule measuring 1.5 × 1.5 cm on the inferior wall of the gallbladder. This nodule was covered by peritoneum and had a stalk consisting of an artery derived from the cystic

artery and bile duct draining into the cystic duct (Figure). After careful dissection, the bile duct and artery to this nodule were clipped simultaneously with laparoscopic staples. The rest of the operation was uncomplicated. Histology confirmed normal hepatic architecture. Normal portal triads were present which eventually drained into the artery, vein and bile duct at the hilum of the nodule.

## Discussion

Ectopic livers are rare and usually found incidentally at the time of laparoscopy or autopsy. In an article by Tejada and Danielson in 1989, only 17 cases were identified after an exhaustive search dating back to 1866.<sup>1</sup> Of these 17 cases, 15 were found incidentally (6 during autopsy and 9 as part of a surgical specimen); the remaining two were cases cited by Cullen in 1925, and the circumstances under which they were identified were uncertain. It was also noted in their article that Eiserth, a Hungarian pathologist, had only discovered three cases of ectopic liver after performing 5,500 autopsies.<sup>1</sup> However, in a report by Sato and colleagues detailing anatomical variations

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**Figure.** (A) Ectopic liver nodule on the inferior surface of the gallbladder. (B) Ectopic liver with its own bile duct and artery at the hilum. It was clipped on either end with laparoscopic staples. (C, D) The remainder of the laparoscopic cholecystectomy was uncomplicated.

encountered during laparoscopy, they found that 0.7% (12 of 1,802) of patients had ectopic liver.<sup>2</sup> While this incidence is thought to be too high by some, it may suggest an underlying racial or geographical variation.<sup>3</sup>

When present, it is normally found in the vicinity of the liver, such as the gallbladder, hepatic ligaments, diaphragm, adrenal glands, pancreas, omentum, spleen and umbilical cord.<sup>4</sup> Extraperitoneal locations (mainly intrathoracic) have also been reported, but are even less common and may follow traumatic implantation or seeding during surgery.<sup>5,6</sup> Mechanisms that may explain its occurrence include displacement of part of the liver at the time of migration of pars hepatica in embryonic life; growth with subsequent atrophy of part of the liver connecting that tissue to the main liver with resultant separation of tissue; and aberrant differentiation of embryonal tissue giving rise to ectopic nodules.<sup>1,4</sup> A simple

classification system is therefore: (1) accessory liver lobe, when it remains connected to the main liver; (2) ectopic liver, when it is completely detached from the main liver; (3) aberrant microscopic tissue with islands of hepatic tissue within non-hepatic tissue.<sup>1</sup>

Interestingly, although generally a rare and benign finding of no clinical significance, ectopic livers can cause clinically relevant pathology such as compression of adjacent viscera, bleeding or abdominal pain.<sup>7-11</sup> Ectopic livers have been reported to cause compression of the oesophagus, portal vein, pylorus and, in a case report involving intrathoracic ectopic liver in a neonate, significant respiratory distress.<sup>7-10</sup> Pujari and Deodhare also reported a case of recurrent abdominal pain due to torsion of an accessory lobe.<sup>11</sup> In addition, ectopic liver has the propensity for carcinogenesis which can occur in the absence of cirrhosis or malignancy in the mother liver.<sup>12</sup> Ectopic

liver, being hepatic in nature, certainly experiences the same disease processes as mother liver. Therefore, it would be expected that ectopic livers would be at risk of carcinogenesis should cirrhosis be present within it and the mother liver. However, HCC within ectopic liver independent of cirrhosis or HCC in the mother liver occurs more frequently than expected. Arakawa et al reviewed 22 cases of HCC in ectopic liver and noticed that in only six (27%) cases were there cirrhosis in the mother liver, when typically over 80% of patients with HCC would be expected to have cirrhosis.<sup>12</sup> It has also been noted that the majority of HCC in ectopic livers have been reported in the Oriental population, although three cases have been reported by Leone et al in Caucasian patients.<sup>13</sup> The reason for underlying predisposition for carcinogenesis is unknown, although it is likely that small ectopic livers which may appear architecturally normal are metabolically handicapped by compromised vascular supply or impaired biliary drainage facilitating carcinogenesis.<sup>12,13</sup> Ectopic livers have also been associated with cholelithiasis and acute or chronic cholecystitis, although these conditions are probably unrelated.<sup>14</sup>

While surgical excision of the symptomatic ectopic liver is warranted, management of the incidentally discovered ectopic liver remains unclear. Incidental ectopic liver associated with the gallbladder should be excised as part of the cholecystectomy specimen, but no recommendations or guidelines could be found for the incidental ectopic liver which is asymptomatic, clearly not related to any pathologies and located away from the surgical site. Most clinicians would recommend surgical excision for fear of its malignant potential, however, due to the low incidence of ectopic liver, the behaviour of the ectopic liver is largely unknown and evidence to support those recommendations are currently lacking. As for HCC in ectopic livers, their unique anatomical position renders them amenable to curative resection. Although long-term results are lacking, treatment of such cancers can lead to good long-term prognosis as demonstrated in reports by Leone et al,<sup>13</sup> Asselah et al,<sup>15</sup> and Hoffman et al.<sup>16</sup>

In conclusion, ectopic liver is an uncommon anomaly that can be associated with significant pathology. In particular, it is associated with HCC in the Oriental population.

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