

Intrahepatic gallstones

A case report

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Summary

A Coloured woman was admitted to hospital with a 3-day history of acute right upper abdominal pain, nausea and vomiting. Acute cholecystitis was confirmed by biliary imaging using technetium-99m. An acutely inflamed gallbladder and two pigment stones in the common bile duct were removed. There were numerous retained gallstones in biliary radicles of the right hepatic duct; attempts to dislodge these by saline flushing failed. An extended choledochotomy with further exploration of the intrahepatic radicles also failed to remove the incarcerated stones. Biliary enteric drainage was achieved by choledochoduodenostomy and short-term postoperative progress was uneventful.

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Case report

A Coloured woman was admitted to Tygerberg Hospital, Parowvallei, CP, with a 3-day history of acute right upper abdominal pain, nausea and vomiting. On examination she was pyrexial but not jaundiced. Abdominal palpation elicited mild pain in the right hypochondrium. Leucocytosis and an elevated blood sedimentation rate were present. Acute cholecystitis was considered in the differential diagnosis and was confirmed by biliary imaging using technetium-99m.

At laparotomy an acutely inflamed gallbladder containing biliary mud was removed. Intra-operative cholangiography resulted in the removal of two pigment stones from the common bile duct. Numerous retained gallstones situated in the right hepatic biliary radicles were demonstrated by a T-tube cholangiogram performed on the 9th postoperative day (Fig. 1). Attempts to dislodge the retained stones by saline flushing were unsuccessful. Irrigation of the common bile duct via the T tube with heparin or mono-octanoin-containing solutions was not attempted. The common bile duct and intrahepatic radicles were re-explored through an extended choledochotomy. Attempts to dislodge the incarcerated stones

Gallstones may be situated either in the gallbladder, common bile duct or hepatic radicles. Extra- or intrahepatic gallstones may be either primary or secondary, the latter being formed in the gallbladder, from which they migrate into the common bile duct.

The majority of intrahepatic stones can be removed by introducing instruments through a choledochotomy incision.¹⁻⁵ However, some stones cannot be removed through the common bile duct because it is difficult or sometimes impossible safely to negotiate tight intrahepatic bile duct strictures produced by recurrent pyogenic cholangitis. In these complex cases a different approach, e.g. transhepatic extraction of stones or resection of the involved portion of the liver, may be necessary.^{6,7}

Despite the high incidence of biliary calculus disease, hepatic calculi are not common in the Western world. However, an analysis of the available literature shows a high incidence of hepatic calculi in the Far East among the Chinese and Japanese populations.^{8,9}

We report the treatment of a patient with acute cholecystitis associated with choledochal and intrahepatic gallstones.

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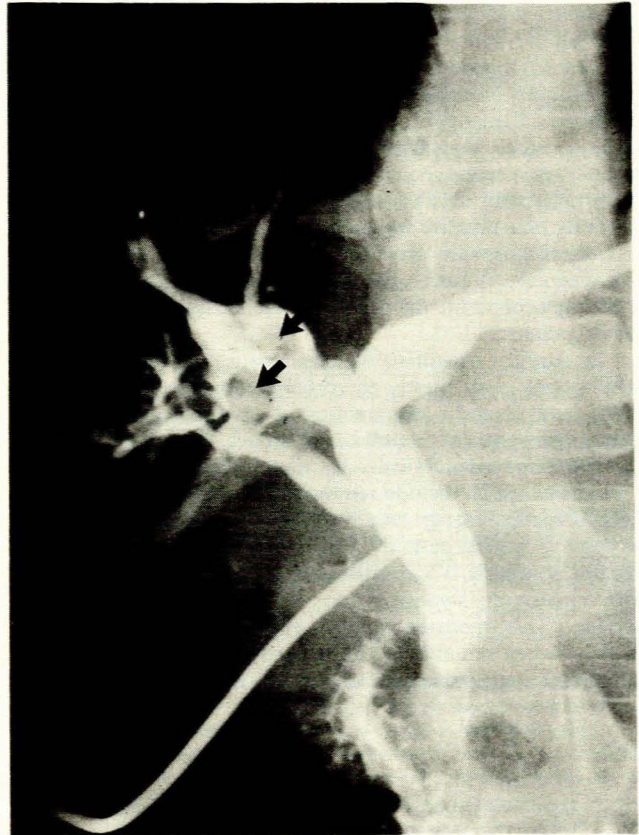


Fig. 1. Operative T-tube cholangiogram showing markedly dilated extra- and intrahepatic ducts. The arrows show large incarcerated stones in the cisterns of the right hepatic ducts.

in the right hepatic biliary radicles by means of saline flushing or manipulation with Desjardin forceps and Fogarty balloon catheters failed. Stenosis of the right hepatic bile duct could not be ruled out at operation. Hepatic lithotomy or resection was not performed and biliary enteric drainage alone was achieved by choledochoduodenostomy. Lipid disorders, chronic parasitic infestation of the gut and haemolytic blood disorders were ruled out as possible causes of the gallstones. The patient remained asymptomatic during the postoperative phase and made good progress in the short term.

Discussion

The incidence of hepatolithiasis differs considerably from area to area and the global incidence remains uncertain. The condition is common in East Asia^{8,9} and the overall incidence of intrahepatic stones in Japan has been reported as ranging from 4% to 15%.^{8,9} In contrast, an incidence of 1.3% has been reported in a clinical study performed in Italy.⁴ In an autopsy study 5 - 7% of Japanese patients with cholelithiasis were found to have intrahepatic calculi.⁸

The majority of liver stones are composed of calcium bilirubinate, but unfortunately most reports are not based on a chemical analysis of the stones.¹⁻⁵ Intrahepatic calculi can be classified as: (i) primary intrahepatic stones exclusively involving the intrahepatic biliary tree; (ii) mixed intrahepatic stones associated with extrahepatic lithiasis, as in our patient; and (iii) secondary intrahepatic stones related to an anatomical condition precipitating stasis or infection.⁴ Primary intrahepatic stones related to chronic parasitic infestation of the biliary tree (ascariasis and clonorchiasis) are common in the Far East,⁹ it has been suggested that mixed and secondary intrahepatic lithiasis are common in Western communities.

Patients with choledochal or hepaticcholedochal lithiasis have similar symptoms — pain, fever and jaundice.¹⁻⁵ The differential diagnosis includes cholecystocholedocholithiasis, liver abscess, empyema of the gallbladder, hepatitis and acute or chronic cholangitis. The pre-operative diagnosis of intrahepatic calculi may be very difficult. Special investigations include intravenous cholangiography, percutaneous transhepatic cholangiography and endoscopic retrograde cholangiography. Recently non-invasive methods such as computed tomography and ultrasonography have begun to play an important role in the diagnosis.¹⁰ Intra-operative cholangiography and biliary endoscopy constitute the principal and indispensable diagnostic investigations.

The surgical treatment of intrahepatic lithiasis attempts to achieve two goals, firstly the relief of obstruction of the bile ducts, and secondly the creation of unimpaired bilio-enteric flow to prevent the recurrence of stones. Intrahepatic calculi may be removed surgically by direct, indirect or combined approaches which include removal or extraction of calculi with forceps, manual manipulation, flushing with saline, and Dormia or Fogarty catheterization.^{6,7,11} In 16% of cases a direct or intrahepatic approach is indicated due to incarceration of calculi with underlying stenosis of the hepatic ducts or their confluence.⁴ This approach requires expertise in hepatic surgery. In most cases removal of the majority of stones may suffice, for even if some stones are left behind they may subsequently

pass through a biliary intestinal anastomosis. However, intrahepatic calculi which have caused segmental intrahepatic ductal narrowing may be difficult or impossible to remove. In these difficult circumstances transhepatic cholangiolithotomy or hepatic lobectomy may be a better definitive procedure in selected cases.^{6,7} In all these cases biliary-intestinal anastomoses should be considered and may include sphincteroplasty, Roux-en-Y choledochojejunostomy or, as performed in our patient, choledochoduodenostomy.

The operative mortality among intrahepatic gallstone patients ranges from 10% to 15% and is related to the extent of the operation.⁵

The results of operative treatment are disappointing. Complete removal of intrahepatic stones is very difficult and in one series the success rate with lithotomy alone was only about 50%.⁵ In another series of 52 patients who survived for 3 or more years after surgery there was complete rehabilitation in 72% and incomplete or no rehabilitation in 13% of cases.⁵ Some patients had residual abnormal liver function test results. It has been suggested that incomplete removal of stones does not necessarily signify therapeutic failure, provided optimal biliary-intestinal drainage is achieved.

Recently Orri *et al.*¹² have reported on the use of the neodymium-YAG laser together with choledochofibrescopic extraction of intractable stones from the intrahepatic bile ducts; the laser had enough power to crush bilirubin stones but was not satisfactory against cholesterol stones.

Attempts to dissolve retained intrahepatic stones with mono-octanoin, a cholesterol solvent, have recently been reported by Thistle *et al.*¹³ It was predominantly effective in dissolving cholesterol stones retained in the bile duct but also beneficial in patients with retained hepatic pigment stones.

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