

ORIGINAL ARTICLE

Anatomic hepatectomy as a definitive treatment for hepatolithiasis: a cohort study

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Abstract

Background: Treatment requirements in hepatolithiasis may vary and may involve a multidisciplinary approach. Surgical resection has been proposed as a definitive treatment.

Objectives: This study aimed to evaluate the clinical results of anatomic liver resection among Chilean patients with hepatolithiasis.

Methods: An historical cohort study was conducted. Patients who underwent hepatectomy as a definitive treatment for hepatolithiasis from January 1990 to December 2010 were included. Patients with a preoperative diagnosis of cholangiocarcinoma were excluded. Preoperative, operative and postoperative variables were evaluated.

Results: A total of 52 patients underwent hepatectomy for hepatolithiasis. The mean \pm standard deviation patient age was 49.8 ± 11.8 years (range: 24–78 years); 65.4% of study subjects were female. A total of 75.0% of subjects had a history of previous cholecystectomy. The main presenting symptom was abdominal pain (82.7%). Hepatic involvement was noted in the left lobe in 57.7%, the right lobe in 34.6% and bilaterally in 7.7% of subjects. The rate of postoperative clearance of the biliary tree was 90.4%. Postoperative morbidity was 30.8% and there were no postoperative deaths. Three patients had recurrence of hepatolithiasis, which was associated with Caroli's disease in two of them. Overall 5-year survival was 94.5%.

Conclusions: Anatomic liver resection is an effective treatment in selected patients with hepatolithiasis and is associated with low morbidity and no mortality. At longterm follow-up, anatomic hepatectomy in these patients was associated with a lower rate of recurrence.

Keywords

hepatectomy, lithiasis, hepatolithiasis, liver resection, therapy

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Introduction

Hepatolithiasis has been defined as the occurrence of stones in any intrahepatic bile duct proximal to the confluence of the right and left hepatic ducts, irrespective of the presence of stones in the main bile duct or the gallbladder.¹ It is prevalent in Japan and Southeast Asia² and uncommon in Western countries.^{3,4}

Hepatolithiasis is now more commonly detected with the regular use of diagnostic imaging methods, of which the most precise is cholangiographic assessment.⁵

Among patients in occidental countries, intrahepatic stones usually occur secondary to bile stasis resulting from an extrahepatic factor (such as common bile duct stones, or postoperative or inflammatory strictures of bile ducts), in congenital diseases (such as Caroli's disease), and in relation to the tendencies of some ethnic groups towards lithogenic bile.^{6–8}

Treatment options are diverse. The therapeutic purpose is to obtain complete clearance of the stone and to avoid recurrent episodes of cholangitis and subsequent hepatic fibrosis and secondary cholangiocarcinoma.¹ Recently, non-surgical procedures,

such as percutaneous transhepatic or peroral cholangioscopic lithotripsy, have been applied to treat hepatolithiasis, but these non-surgical procedures are associated with recurrence rates of 30–60%.^{9–11}

Alternatively, liver resection has been proposed as a definitive treatment for segmental hepatolithiasis because it treats not only the stones, but also strictures and atrophic and inflammatory changes.¹²

The aim of this study was to assess the factors associated with hepatolithiasis in one centre and to evaluate the clinical results of its treatment by anatomic liver resection.

Materials and methods

All patients presenting from January 1990 to December 2010 at the Pontifical Catholic University of Chile Hospital were included in this study. Hepatolithiasis was defined as the presence of stones in the intrahepatic bile duct proximal to the right and left hepatic duct confluence. Hepatectomy involved any procedure in which excision of a part of the liver was performed using anatomic techniques according to Couinaud's segmentation and Brisbane 2000 terminology.¹³ Recurrence was deemed to have occurred when clinical and imaging evidence of new lithiasis was detected in the intrahepatic biliary duct above the biliary confluence.

Patients who were not candidates for hepatectomy and those with a preoperative diagnosis of cholangiocarcinoma were excluded from analysis.

Registered data

Demographic data as well as data on risk factors for hepatolithiasis, comorbidities, previous surgical therapies, clinical presentation, laboratory and imaging tests, perioperative data, postoperative morbidity, mortality and postoperative stone recurrence were recorded for all subjects. The extent of disease was assessed by imaging studies, including abdominal ultrasound (US), computed tomography (CT) and/or magnetic resonance cholangiopancreatography (MRCP). Some patients also underwent endoscopic retrograde cholangiopancreatography (ERCP) or percutaneous transhepatic cholangiography (PTC). A multidisciplinary team defined the type of liver resection based on imaging findings.

Clinical results and patient outcomes were classified in short- and long-term categories. Short-term results included postoperative morbidity (any complication occurring within 30 days of surgery). Long-term results included any morbidity or sequel detected during follow-up (any complication occurring >30 days after surgery), the rate of recurrence of stones and long-term survival.

Procedural details

Hepatectomy was considered to be indicated in all patients with symptomatic hepatolithiasis with hepatic or intrahepatic duct stenosis, or with recurrent pyogenic cholangitis and atrophy of

the affected segments, with or without liver abscesses. An anatomic resection (with or without the Pringle manoeuvre) using an open or laparoscopic approach was performed for all segments affected by biliary stenosis and the affected bile duct drainage area. Hepaticojejunostomy was performed in patients with common bile duct stenosis and in those considered to be at high risk for recurrence. At each exploration of the common bile duct, routine cholangiography, with or without choledochoscopy, was performed to ensure clearing of the biliary system. When the biliary tract was not explored, cholangiography was achieved through the cystic duct and US was performed to detect residual stones. Drains were used routinely and removed postoperatively if there was no evidence of bile leakage or bleeding between postoperative days 2 and 5.

Postoperative management

Routine nasogastric drainage was not employed. Re-feeding was initiated 24 h after surgery if the patient showed signs of gastrointestinal transit resumption and had no nausea. Antibiotic prophylaxis was used for 24 h perioperatively. Standard doses of therapeutic antibiotics were used in patients with cholangitis or liver abscess. Routine liver tests were monitored after surgery on days 1, 3 and 5, and as required according to the patient's clinical status.

Follow-up

Recurrence screening was conducted using liver function tests. Ultrasound or CT were performed every 6 months for the first 2 years postoperatively and then annually or when the patient had symptoms of recurrence. To confirm the suspicion of recurrence, endoscopic or percutaneous cholangiography was carried out; from 2000 onwards MRCP was used.

Statistical analysis

Variables are presented using descriptive statistics with measures of central tendency and dispersion. Chi-squared and Fisher's tests were used for univariate subgroup and categorical variable analyses. Student's *t*-test and analysis of variance (ANOVA) were used for continuous variables. A binary logistic regression model was generated for multivariate analysis. The Kaplan–Meier method was used for survival analysis. A *P*-value of <0.05 was considered to indicate statistical significance. All analyses were performed using spss Version 18.0 (SPSS, Inc., Chicago, IL, USA).

Report

This manuscript was developed according to the STROBE (*strengthening the reporting of observational studies in epidemiology*) criteria for the reporting of cohort studies.¹⁴

Results

From 1990 to 2010, a total of 52 patients underwent anatomic liver resection for treatment of hepatolithiasis. Twenty-six of these operations (50.0%) were performed between 2004 and 2010.

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