



Original research

Prophylactic laparoscopic cholecystectomy in adult sickle cell disease patients with cholelithiasis: A prospective cohort study



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HIGHLIGHTS

- Prophylactic cholecystectomy in sickle cell disease patient with asymptomatic cholelithiasis is a safe procedure.
- We observed a 4% sickle cell disease related morbidity in asymptomatic patients with cholelithiasis who had cholecystectomy.
- In our symptomatic patients, Sickle Cell Disease related morbidity was 14%.
- Prophylactic cholecystectomy can reduce sickle cell disease related complications.

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ABSTRACT

Introduction: Prophylactic laparoscopic cholecystectomy remains controversial and has been discussed for selected subgroups of patients with asymptomatic cholelithiasis who are at high risk of developing complications such as chronic haemolytic conditions. Cholelithiasis is a frequent condition for patients with sickle cell disease (SCD). Complications from cholelithiasis may dramatically increase morbidity for these patients. Our objective was to evaluate the effectiveness of prophylactic cholecystectomy in SCD patients with asymptomatic gallbladder stones.

Methods: From January 2000 to June 2014, we performed 103 laparoscopic cholecystectomies on SCD patients. Fifty-two patients had asymptomatic cholelithiasis. The asymptomatic patients were prospectively enrolled in this study, and all underwent a prophylactic cholecystectomy with an intraoperative cholangiography. The symptomatic patients were retrospectively studied. Upon admission, all patients were administered specific perioperative management including intravenous hydration, antibiotic prophylaxis, oxygenation, and intravenous painkillers, as well as the subcutaneous administration of low-molecular-weight heparin. During the same period, 51 patients with SCD underwent a cholecystectomy for symptomatic cholelithiasis. We compared these 2 groups in terms of postoperative mortality, morbidity, and hospital stay.

Results: There were no postoperative deaths or injuries to the bile ducts in either group. In the asymptomatic group, we observed 6 postoperative complications (11.5%), and in the symptomatic group, there were 13 (25.5%) postoperative complications.

Discussion: Regarding the SCD complications, we observed 1 case (2%) of acute chest syndrome in an asymptomatic cholelithiasis patient, while there were 3 cases (6%) in the symptomatic group. Vaso-occlusive crisis was observed in 1 patient (2%) with asymptomatic cholelithiasis, and in 4 patients (8%) in the other group. The mean hospital stay averaged 5.8 (4–17) days for prophylactic cholecystectomy and 7.96 (4–18) days for the comparative symptomatic group.

Conclusions: Postoperative complications related to SCD were less frequent for asymptomatic patients who had a laparoscopic prophylactic cholecystectomy. This intervention, if performed with perioperative specific management, is safe and helps avoid emergency operations for acute complications including cholecystitis, choledocholithiasis, and cholangitis. For SCD patients, a prophylactic cholecystectomy reduces hospital stays.

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1. Introduction

In a recent review, asymptomatic cholelithiasis has a benign natural course. Six to 20% of patients develop symptoms during follow-ups of 4–20 years, and less than 5% develops complications [1]. According to the natural history of silent gallstones, in 1993, an NIH Consensus Conference Report considered asymptomatic gallstones as not an indication for prophylactic cholecystectomy [2]. However, these recommendations could be discussed for high-risk subgroups such as patients with sickle cell disease, diabetes mellitus, asymptomatic cholelithiasis associated with common bile duct (CBD) stones, suspected malignancy, and porcelain gallbladder [1,3,4].

Prophylactic cholecystectomy should be considered for SCD patients with asymptomatic cholelithiasis for various reasons: first, a vaso-occlusive crisis and biliary complications could have similar presenting symptoms including fever, abdominal pain, leucocytosis, and jaundice, and a definitive diagnosis and management could be difficult in this situation. Second, the natural history of cholelithiasis in patients with chronic haemolytic anaemia is different from that of the general population in which cholelithiasis affects only 10% of adults. Prevalence increases slowly with age and after the age of 60 years, it increases from 10% to 15% for men and 20%–40% for women with present stones [1]. However, with SCD, cholelithiasis is observed in 70% of adults older than 30 years [5,6]. In fact, the incidence of pigmented stones in patients with chronic haemolytic diseases is frequent, including paediatric patients, and increases with age: 14% for those under 10 years, 22% for those between 10 and 14 years of age, 36% for those between 15 and 18 years of age, and 50% for patients over 22 years of age [7–9]. Third, contrary to the general population in whom 2–5% develop biliary complications during a follow-up of 5–20 years, this risk is higher for SCD patients. Fifty per cent develops complications within 3–5 years of diagnosis [1]. In this specific group, emergency surgery can be associated with high morbidity and mortality [10–13]. The purpose of this study was to show that laparoscopic prophylactic cholecystectomy has a lower morbidity than cholecystectomy performed for symptomatic lithiasis.

2. Materials and methods

The Department of Haematology at the University Hospital Tenon, with about 700 hospitalizations every year, was certified as a reference centre for the management of patients with a major SCD in France (<http://www.orpha.net/orphacom/cahiers/docs/FR/Liste-des-centres-de-referance-labellises.pdf>).

From January 2000, along with the haematologists and anaesthesiologists, we decided to evaluate the usefulness of a prophylactic elective laparoscopic cholecystectomy prospectively for adult SCD patients who had asymptomatic cholelithiasis. The prospective management of these asymptomatic patients was carried out over a 14-year period from 2000 to 2014.

Until June 2014, all the 52 adult SCD patients with asymptomatic cholelithiasis who were diagnosed by ultrasound received an operation and underwent a prophylactic cholecystectomy with a routine intraoperative cholangiography. During the same period, we also reviewed the records of 51 other SCD patients who underwent an elective laparoscopic cholecystectomy for symptomatic cholelithiasis. All patients had an ultrasound examination of the gallbladder and biliary tract and were diagnosed with gallbladder cholelithiasis without stones in the CBD, and in both groups, no SCD patients had any common duct stones that were diagnosed preoperatively. Among 52 patients with asymptomatic cholelithiasis, 43 had homozygous sickle cell haemoglobin HbSS; 4 had heterozygous sickle cell haemoglobin HbSC; 4 had thalasso-sickle cell

disease; and 1 had associated β -thalassemia. The patients' ages were between 18 and 53 years, with a mean age of 26.5 years. There were 39 females. The mean preoperative haemoglobin level was 8.5 g/dL (range, 6.1–12.6).

In the symptomatic patient group, there were 42 homozygous sickle cell haemoglobin HbSS patients, 6 heterozygous sickle cell haemoglobin HbSC patients, and 3 thalasso-sickle cell disease patients. Their mean age was 25.4 years (range, 18–46), with a total of 36 females. The mean preoperative haemoglobin level was 8.6 g/dL (range, 6–11).

Perioperative management was performed for all patients who had an operation. This management involved a multidisciplinary approach including haematologists, anaesthesiologists, and surgeons. All patients were hospitalized in the Department of Surgery 1 day before the cholecystectomy. Initially, and until 2005, all patients with a haemoglobin level below 10 g/dL received a blood transfusion to achieve a preoperative haemoglobin level of >10 g/dL. Since 2006, exchange transfusion was given only to patients with a haemoglobin level of <7 g/dL. Upon admission, all patients received intravenous hydration, which was continued until the patients were able to drink 2 L of water independently per day. Intravenous antibiotic prophylaxis with amoxicillin or penicillin was started 1 h before the cholecystectomy and was continued for 5 days post-operation. Further, additional interventions included the following: oxygenation incentive spirometry use; intravenous painkillers were continued on an oral basis; the subcutaneous administration of low-molecular-weight heparin in preventive doses during the postoperative period; and early mobilization.

During the same study period, we have also operated on 2 emergency patients, 1 for acute cholecystitis and the other for cholangitis with CBD stones. This was the only patient who had CBD stones diagnosed preoperatively by ultrasound. He was excluded because our objective was to evaluate the treatment of asymptomatic gallbladder lithiasis without complications. Emergency procedures were not included in this study.

Laparoscopic cholecystectomy was carried out under general anaesthesia and with the application of a thermal cover at 40 °C for the entire operative period. The pneumoperitoneum was made through an umbilical incision or in the left hypochondrium with subsequent introduction of a 10-mm trocar for insufflation of carbon dioxide at a pressure of 12 mmHg. Laparoscopic cholecystectomy was performed using a standard 4-port technique. Cholangiography was routinely performed by injection of iodinated contrast (Hexabrix 320 mg/mL) into the biliary tract through a percutaneous catheter with a 20-F-diameter rigid tip (Applied Medical, USA) and introduced in the cystic duct by using a cutaneous incision in the right hypochondrium. Opacification of the CBD, as well as the passage of contrast into the duodenum, has been confirmed through a radiology handset available in the operating room. If stones were found in the CBD, they were removed by introduction of a Dormia basket (or with jets of a saline solution under high pressure in the bile duct after choledochotomy), so as to spill the stones from cystic duct. Only if it was impossible to extract the stones from the CBD, a conversion to an open cholecystectomy and a choledochotomy was performed to complete the stone extraction. In these cases, a T-tube was left in place.

We compared the results observed in the 2 patient groups that received an elective operation, in terms of postoperative mortality, morbidity, and days of hospital stay. The outcome was correlated in both groups. Both groups used a χ^2 test to compare their preoperative and postoperative characteristics. P values of <0.05 were considered statistically significant. We report our observational studies according to the Strengthening of Reporting of Observational Studies in Epidemiology (STROBE): <http://www.sciencedirect.com/science/article/pii/S174391911400212X>.

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