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Laparoscopic Cholecystectomy in Sickle Cell Patients at Brazzaville University Hospital: Study and Analysis of Results

Elion Ossibi Pierlesky[1,2*], Massamba Miabaou Didace[1,2], Note Madzele Murielle Etiennette Julie[1,2], Bhodeho Monwongui Medi[1], Tsouassa Wa Ngono Giresse Bienvenu[1], Avala Prude Pertinie[1], Motoula Latou Noé Henschel[1]

[1]Digestive Surgery Department, Brazzaville University Hospital, Congo
[2]Faculty of Health Sciences, Marien Ngouabi University, Congo

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***Corresponding author:** Elion Ossibi Pierlesky
Digestive Surgery Department, Brazzaville University Hospital, Congo

Abstract **Original Research Article**

Introduction: Gallbladder lithiasis is a condition frequently encountered in homozygous sickle cell patients. The aim of surgical treatment is to remove the gallbladder. Laparoscopy remains the preferred approach. The aim of this study was to describe the epidemiological, clinical and evolutionary aspects of patients with sickle cell disease who had undergone laparoscopic cholecystectomy. ***Materials and Methods:*** This was a retrospective descriptive study carried out in the Department of Digestive Surgery over a 2-year period from 1 June 2020 to 31 June 2022. We included all homozygous sickle cell patients who had undergone laparoscopic cholecystectomy. ***Results:*** We identified 40 patients, with an average age of 22 years and extremes ranging from 16 to 35 years. Females predominated in 25 cases. Pain in the right hypochondrium was the most frequent reason for consultation. All patients underwent abdominal ultrasound. All patients were ASA I. The French position was the most commonly used. The average duration of the operation was 51 minutes. Retrograde cholecystectomy was performed in all patients. The average hospital stay was 24 hours. Post-operative management was straightforward in 90% of cases. Post-operative complications were dominated by abdominal vaso-occlusive crisis. ***Conclusion:*** Laparoscopic cholecystectomy remains the gold standard for patients with sickle cell disease.

Keywords: homozygous sickle cell disease, cholecystectomy, laparoscopy, vesicular lithiasis.

INTRODUCTION

Sickle cell disease is an autosomal recessive genetic disorder. It is linked to a structural anomaly in haemoglobin, resulting in the formation of haemoglobin (Hb) S, which is responsible for cellular and molecular changes in red blood cells. The presence of sickle-shaped red blood cells leads to chronic haemolysis and increased susceptibility to a number of complications, including vesicular lithiasis. This condition mainly affects populations in inter-tropical Africa. Its prevalence is estimated at 1.25% in Congo Brazzaville [1 - 3]. Laparoscopic cholecystectomy is the gold standard surgical treatment for vesicular lithiasis [4 - 8]. In Congo, in 2019, Note *et al.*, [9] reported on laparoscopic cholecystectomy. To date, no work on laparoscopic cholecystectomy has been carried out in the Congo. We therefore suggested to carry out this study with the aim of reporting our experience of laparoscopic cholecystectomy in patients with sickle cell disease in the Congo.

PATIENTS AND METHOD

This was a descriptive and analytical study with retrospective data collection that took place in the digestive surgery department at the Brazzaville University Hospital, from [1]June 2020 to 31 May 2022 (2 years).

We included in this study all patients with sickle cell disease aged at least 15 years old who had undergone laparoscopic cholecystectomy.

The parameters studied were epidemiological, diagnostic, therapeutic and evolutionary. The data were collected and analysed using Excel 2020 software.

RESULTS

Out of 1351 patients hospitalised for digestive surgery during the study period, 40 patients with sickle cell disease underwent laparoscopic cholecystectomy, representing a hospital frequency of 2.96%. The middle

age of patients was 22 years, with extremes ranging from 16 to 35 years.

There were 15 men and 25 women, giving a ratio of 0.6. All patients were homozygous sickle cell patients. The main reason for consultation was pain in the right hypochondrium and/or epigastrium.

Clinically, palpation of the abdomen revealed tenderness of the hypochondrium and/or epigastrium in all our patients. All patients underwent abdominal ultrasound, which revealed vesicular lithiasis (Figure 1).

Figure 1: Ultrasound image showing a gallbladder containing microlithiasis

All patients were classified as ASA I.

The main indication for surgery was symptomatic vesicular lithiasis.

All patients underwent laparoscopic surgery. Patients were positioned in the French position (n = 36) and in the English position (n = 4).

Surgical investigation revealed a thin-walled lithiasis gallbladder (n = 37) and acute oedematous cholecystitis (n = 3).

Retrograde cholecystectomy was performed in all patients (Figure 2).

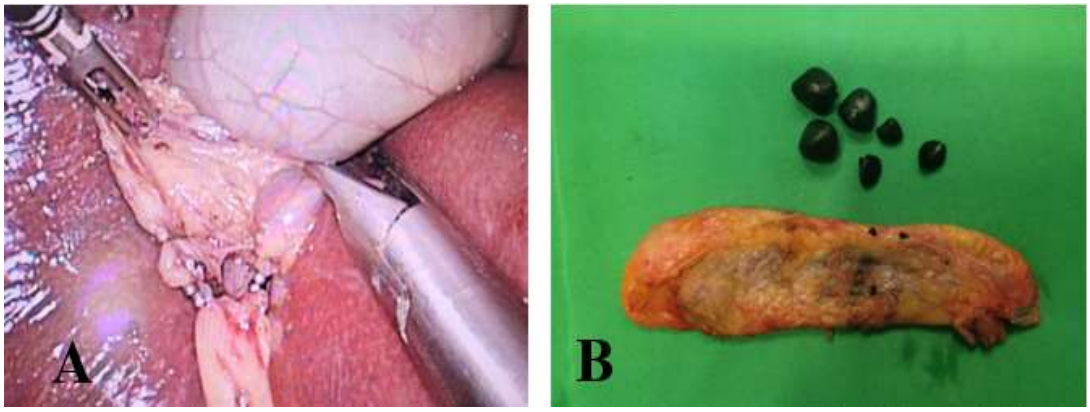

Figure 2: Images showing dissection of the artery and cystic duct with a clip on them (A) and the cholecystectomy specimen with black stones (B)

The average duration of the operation was 51 minutes, with operating time ranging from 45 to 120 minutes.

The average length of hospitalisation after the operation was 36 hours (extremes: 24 - 48 hours).

Post-operative management was straightforward in 90% of cases. Post-operative complications included abdominal vaso-occlusive crisis (2 cases) and one case of acute thoracic syndrome. Post-surgical mortality was zero.

DISCUSSION

Gallstones are a frequent complication in patients with sickle cell disease due to recurrent episodes of haemolysis leading to increased bilirubin excretion and the formation of pigmented gallstones. The

prevalence of gallstones in homozygotes changes from country to country: 34-70% in the USA, 29% in Jamaica, 4-25% in Africa and 8% in Saudi Arabia [10-12]. The same prevalence has been found in Senegal [4] and Niger [8].

During the study period, 40 patients with sickle cell disease underwent surgery for symptomatic gallbladder disease, representing a hospital frequency of 2.96%. This figure reflects the relative frequency of lithiasis in this population, confirming the data in the literature which report a high prevalence of gallstone disease in sickle cell patients.

The average age of patients was 22 years, which is consistent with the literature, which emphasises that lithiasis complications can occur in sickle cell patients as early as adolescence [4, 13]. The female predominance observed in our series could be multifactorial, including recruitment bias, greater symptomatic expression or more frequent consultation of women.

As in the work of Sani in Niger [8] and Fall in Senegal [4] in our study, clinically all patients presented with pain localised to the right hypochondrium and/or epigastrium, which is the classic clinical sign of hepatic colic, and in some cases cholecystitis. Abdominal ultrasound confirmed the presence of vesicular lithiasis in all patients, reinforcing its central role in the diagnosis of biliary pathology, particularly in a sickle cell context where clinical diagnosis can be tricky due to symptoms that are sometimes atypical or confused with a vaso-occlusive crisis.

Surgically, all patients were classified as ASA I, suggesting good preoperative assessment and optimisation of general condition, which is essential to reduce the risk of anaesthetic and postoperative complications. The main indication for surgery was symptomatic vesicular lithiasis, which is in line with current recommendations favouring preventive management in patients with sickle cell disease, in order to avoid serious infectious complications or vaso-occlusive crises secondary to an acute biliary episode. In addition, cholecystectomy is recommended in the United Kingdom and the United States as soon as symptomatic vesicular lithiasis appears in adults [14 - 15]. The French recommendations, published in 2015 and based on a consensus of experts, suggest "cold" laparoscopic cholecystectomy as soon as vesicular lithiasis is identified, in order to prevent the development of infectious complications [16].

All the operations were carried out laparoscopically, with an average operating time of 51 minutes, which is comparable to the times reported in the literature [17]. The "French" position was used in the majority of cases, illustrating a technical preference on the part of the surgical team. Retrograde cholecystectomy was systematically performed, a technique often recommended in cases of difficult anatomy or moderate inflammation. Three cases of oedematous cholecystitis were observed, probably requiring more meticulous management but without any major increase in operating time.

Post-operative recovery was straightforward in 90% of cases, with a short hospital stay (average 24 hours), reflecting rapid recovery and the benefits of a minimally invasive approach in these fragile patients. However, three post-operative complications were noted: two abdominal vaso-occlusive crises and an acute thoracic syndrome, complications that are well known in sickle cell patients, particularly during periods of surgical stress. These results highlight the importance of multidisciplinary supervision and specific management during the perioperative period (oxygenation, hydration, pain control, infection prevention).

Finally, the absence of postoperative mortality is a very encouraging result, testifying to the safety of the procedure when it is well prepared and adapted to the specific characteristics of the sickle cell patient.

CONCLUSION

Laparoscopic cholecystectomy in homozygous sickle cell patients proved to be a safe and effective approach in our series.

The main indication for surgery was symptomatic vesicular lithiasis, confirmed by ultrasound in all patients.

The laparoscopic surgical technique, performed mainly in the French position, enabled satisfactory exploration and systematic retrograde cholecystectomy, even in cases of acute oedematous cholecystitis. Overall, the operating time was short and post-operative recovery rapid, with an average hospital stay of 24 hours.

Post-operative management was straightforward in the vast majority of cases, with a low complication rate and no mortality. These results confirm that, despite the high-risk background of sickle cell disease, early and appropriate management can lead to a favourable outcome. Laparoscopic cholecystectomy can therefore be considered the method of choice for the treatment of vesicular lithiasis in patients with sickle cell disease.

Conflicts of interest: The authors declare no conflicts of interest.

Authors' contributions: All the authors played an active part in drafting and editing the article. They have read and approved the final version of the manuscript.

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