

## Original Research Article

# Surgical Liver Diseases in a Resource-Limited Setting: A 10-Year Multicenter Retrospective Study of Epidemiological Patterns, Diagnostic Features, Management Strategies, and Outcomes in Douala, Cameroon

Basile Essola<sup>1</sup>, Fred Dikongue<sup>1</sup>, Valery Onana Mvondo<sup>2</sup>, Donald Mike Emmanuel Lougui Njock<sup>1</sup>, Achille Many Essomba<sup>3</sup>, Jean Paul Engbang<sup>1,4\*</sup>

<sup>1</sup>Faculty of Medicine and Pharmaceutical Sciences, University of Douala, Douala, Cameroon

<sup>2</sup>Faculty of Medicine and Biomedical Sciences, University of Yaoundé I, Yaoundé, Cameroon

<sup>3</sup>Faculty of Medicine and Pharmaceutical Sciences, University of Ebolowa, Sangmelima, Cameroon

<sup>4</sup>Laquintinie Hospital of Douala, Douala, Cameroon

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**Abstract: Background:** Surgical liver diseases encompass a broad spectrum of traumatic, infectious, benign, and malignant conditions associated with substantial morbidity and mortality worldwide. Data on the epidemiology and management of these conditions in sub-Saharan Africa remain scarce, limiting evidence-based planning and resource allocation. **Objective:** To describe the epidemiological characteristics, diagnostic patterns, therapeutic approaches, and outcomes of surgical liver diseases managed in referral hospitals in Douala, Cameroon. **Methods:** We conducted a retrospective multicenter cohort study in four referral hospitals in Douala, Cameroon, including the Douala General Hospital, Douala Laquintinie Hospital, Douala Gyneco-Obstetric and Pediatric Hospital, and the Regional Hospital. Medical records of adult patients managed for surgical liver diseases between January 2012 and December 2021 were reviewed. Patients with incomplete records were excluded. Data regarding demographics, risk factors, clinical presentation, laboratory findings, treatment modalities, and outcomes were extracted and analyzed using descriptive and comparative statistics. **Results:** Between January 2012 and December 2021, 9,749 patients were admitted to the participating surgical departments. Of these, 162 patients were diagnosed with a surgical liver disease, corresponding to a hospital prevalence of 1.66%. After excluding seven records with incomplete data, 155 patients were included in the final analysis. The 31–40-year age group was the most represented, and males accounted for 69.7% of cases (male-to-female ratio: 2.35:1). Primary liver tumors were the most frequent diagnosis (35.5%), followed by hepatic metastases (30.3%), liver trauma (25.2%), liver abscesses (6.5%), and hepatic cysts (2.6%). Hypertension (14.3%), hepatitis C infection (11.0%), hepatitis B infection (8.4%), and alcohol consumption (49.4%) were the most common risk factors. Abdominal pain was the leading presenting symptom (83.1%). Road traffic accidents accounted for 48.7% of liver trauma cases. Anemia was identified in 90 patients (58.1%). A total of 72 patients (46.5%) underwent surgical management. Overall mortality was 23.9%, with higher rates observed among patients with malignant liver diseases. **Conclusion:** Surgical liver diseases represent a significant burden in referral hospitals in Douala, with primary liver tumors and hepatic metastases accounting for nearly two-thirds of cases. Patients frequently present with advanced disease and experience substantial mortality. Strengthening hepatitis prevention strategies, improving early diagnosis, and expanding access to specialized hepatobiliary care are essential to improve outcomes in resource-limited settings.

**Keywords:** Surgical Liver Diseases, Hepatic Tumors, Liver Trauma, Hepatic Metastases, Cameroon, Sub-Saharan Africa, Hepatobiliary Surgery, Multicenter Study.

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## INTRODUCTION

Surgical liver diseases encompass a broad spectrum of traumatic, infectious, benign, and malignant

conditions requiring specialized diagnostic and therapeutic approaches. These disorders represent a substantial global health burden because of their high

\*Corresponding Author: Jean Paul Engbang

Faculty of Medicine and Pharmaceutical Sciences, University of Douala, Douala, Cameroon

morbidity, mortality, and increasing demand for complex multidisciplinary care involving surgeons, hepatologists, radiologists, oncologists, and intensivists [1, 2].

Primary liver cancer remains one of the leading causes of cancer-related death worldwide. According to the Global Cancer Observatory (GLOBOCAN) 2022 estimates, liver cancer ranks as the sixth most commonly diagnosed malignancy and the third leading cause of cancer mortality, accounting for more than 865,000 new cases and approximately 758,000 deaths annually [3]. Hepatocellular carcinoma constitutes nearly 90% of primary liver malignancies and is strongly associated with chronic hepatitis B virus (HBV) and hepatitis C virus (HCV) infections, excessive alcohol consumption, metabolic dysfunction-associated steatotic liver disease, and cirrhosis [4, 5].

In parallel, secondary liver tumors have become increasingly prevalent due to improvements in the diagnosis and management of extrahepatic malignancies. The liver represents the most common site of hematogenous metastasis from colorectal, pancreatic, gastric, breast, and neuroendocrine tumors [6]. Surgical resection, ablative techniques, and systemic therapies have significantly improved survival outcomes in selected patients with liver metastases [7].

Traumatic liver injuries also constitute a major public health concern, particularly in low- and middle-income countries, where rapid urbanization and increasing road traffic density have contributed to a growing burden of abdominal trauma [8]. The liver is among the most frequently injured intra-abdominal organs, with road traffic accidents representing the predominant mechanism of injury in many African settings [9].

Furthermore, pyogenic liver abscesses and symptomatic hepatic cysts continue to pose diagnostic and therapeutic challenges in resource-limited environments due to delayed presentation, restricted access to advanced imaging modalities, and limited availability of interventional radiology services [10].

Sub-Saharan Africa bears a disproportionate burden of liver diseases because of the high endemicity of chronic viral hepatitis, limited implementation of HBV vaccination programs, inadequate screening strategies, and restricted access to specialized hepatobiliary care [11, 12]. In Cameroon, chronic HBV infection affects approximately 8–12% of the adult population, contributing substantially to the incidence of hepatocellular carcinoma [13]. Simultaneously, the epidemiological transition observed across many African countries has led to an increasing incidence of metastatic liver disease and trauma-related hepatic injuries [14].

Despite this growing burden, data regarding the epidemiology, clinical presentation, management

strategies, and outcomes of surgical liver diseases in Central Africa remain scarce. Most available studies focus on a single pathology or originate from high-income countries, limiting their applicability to resource-constrained settings [15, 16]. Comprehensive multicenter data integrating the full spectrum of surgical liver diseases are particularly lacking in Cameroon.

Therefore, this study aimed to describe the epidemiological characteristics, diagnostic patterns, therapeutic approaches, and clinical outcomes of surgical liver diseases managed in four referral hospitals in Douala, Cameroon, over a 10-year period.

## METHODS

### Study Design and Setting

We conducted a retrospective multicenter cohort study in four major referral hospitals in Douala, the economic capital of Cameroon: Douala General Hospital, Douala Laquintinie Hospital, Douala Gynecology-Obstetric and Pediatric Hospital, and the Regional Hospital of Douala.

These institutions serve as tertiary referral centers for the Littoral Region and neighboring areas, providing specialized surgical care, including hepatobiliary surgery, trauma management, oncology, and intensive care services.

The study period extended from January 1, 2012, to December 31, 2021.

### Study Population

The study included all adult patients ( $\geq 18$  years) admitted to the participating surgical departments with a diagnosis of surgical liver disease during the study period.

Surgical liver diseases were defined as hepatic conditions requiring surgical evaluation or management, including traumatic liver injuries, primary liver tumors, hepatic metastases, liver abscesses, and symptomatic hepatic cysts.

### Inclusion Criteria

Patients were eligible if they:

- were aged 18 years or older;
- had a confirmed diagnosis of a surgical liver disease based on clinical, radiological, intraoperative, and/or histopathological findings;
- received care in one of the participating hospitals during the study period;
- Had complete and analyzable medical records.

### Exclusion Criteria

Patients were excluded if they:

- had incomplete medical records with substantial missing data;

- had uncertain or unconfirmed diagnoses;
- Were managed exclusively in outpatient settings.

### Sampling and Participant Selection

A consecutive exhaustive sampling strategy was used. Hospital registers, surgical ward records, operative reports, imaging databases, and pathology archives were reviewed to identify eligible patients.

Among 9,749 patients admitted to the participating surgical departments during the study period, 162 cases of surgical liver diseases were identified, corresponding to a hospital prevalence of 1.66%. Seven records with substantial missing data were excluded, leaving 155 patients for the final analysis.

### Data Collection

Data were extracted using a standardized data collection form by trained investigators.

The following variables were collected:

#### Sociodemographic Variables

- age;
- sex;
- occupation;
- region of origin.

#### Clinical Variables

- medical history (hypertension, diabetes mellitus, hepatitis B, hepatitis C, HIV infection, cirrhosis);
- alcohol and tobacco consumption;
- presenting symptoms;
- mechanism of injury for traumatic cases;
- physical examination findings;
- vital signs at admission.

#### Laboratory Variables

- hemoglobin level;
- white blood cell count;
- C-reactive protein;
- liver function tests (alanine aminotransferase, aspartate aminotransferase, bilirubin levels);
- alpha-fetoprotein levels.

#### Imaging and Diagnostic Variables

- abdominal ultrasonography findings;
- computed tomography findings;
- histopathological diagnosis when available.

#### Therapeutic Variables

- medical treatment;
- interventional procedures;
- surgical management;
- blood transfusion;
- chemotherapy.

### Outcome Variables

The primary outcome was in-hospital mortality.

Secondary outcomes included:

- postoperative or in-hospital complications;
- length of hospital stay;
- discharge status.

### Statistical Analysis

Data were entered and analyzed using IBM SPSS Statistics version 26.0 (IBM Corp., Armonk, NY, USA).

Continuous variables were assessed for normality using graphical methods and the Shapiro-Wilk test. Normally distributed variables are presented as means  $\pm$  standard deviations, whereas non-normally distributed variables are presented as medians and interquartile ranges.

Categorical variables are presented as frequencies and percentages.

Comparisons between groups were performed using the chi-square test or Fisher's exact test for categorical variables and Student's t-test or the Mann-Whitney U test for continuous variables, as appropriate. A multivariable logistic regression model was constructed to identify independent predictors of in-hospital mortality.

Variables with a p-value  $< 0.20$  in univariate analyses and those considered clinically relevant were entered into the model. Collinearity between treatment-related variables was assessed before model fitting.

The final model included age  $> 60$  years, tumoral disease (primary liver tumors or hepatic metastases), anemia at admission, and treatment strategy (curative/interventional versus palliative care).

Adjusted odds ratios (aORs) with 95% confidence intervals (95% CIs) were calculated. Model calibration was assessed using the Hosmer-Lemeshow goodness-of-fit test.

Statistical significance was defined as a two-sided p-value  $< 0.05$ .

### Ethical Considerations

Ethical approval was obtained from the Institutional Review Board of the Faculty of Medicine and Pharmaceutical Sciences of the University of Douala.

Administrative authorization was obtained from each participating hospital.

Given the retrospective nature of the study, the requirement for informed consent was waived. Patient confidentiality was ensured through data anonymization and secure storage throughout the study process.

The study was conducted in accordance with the ethical principles outlined in the Declaration of Helsinki.

## RESULTS

### Participant Selection

During the study period, 9,749 patients were admitted to the surgical departments of the four

participating hospitals. A total of 162 patients were identified as having a surgical liver disease, corresponding to a hospital prevalence of 1.66%. Seven records with substantial missing data were excluded, leaving 155 patients for the final analysis.

A STROBE flow diagram illustrating participant selection is presented in Figure 1.

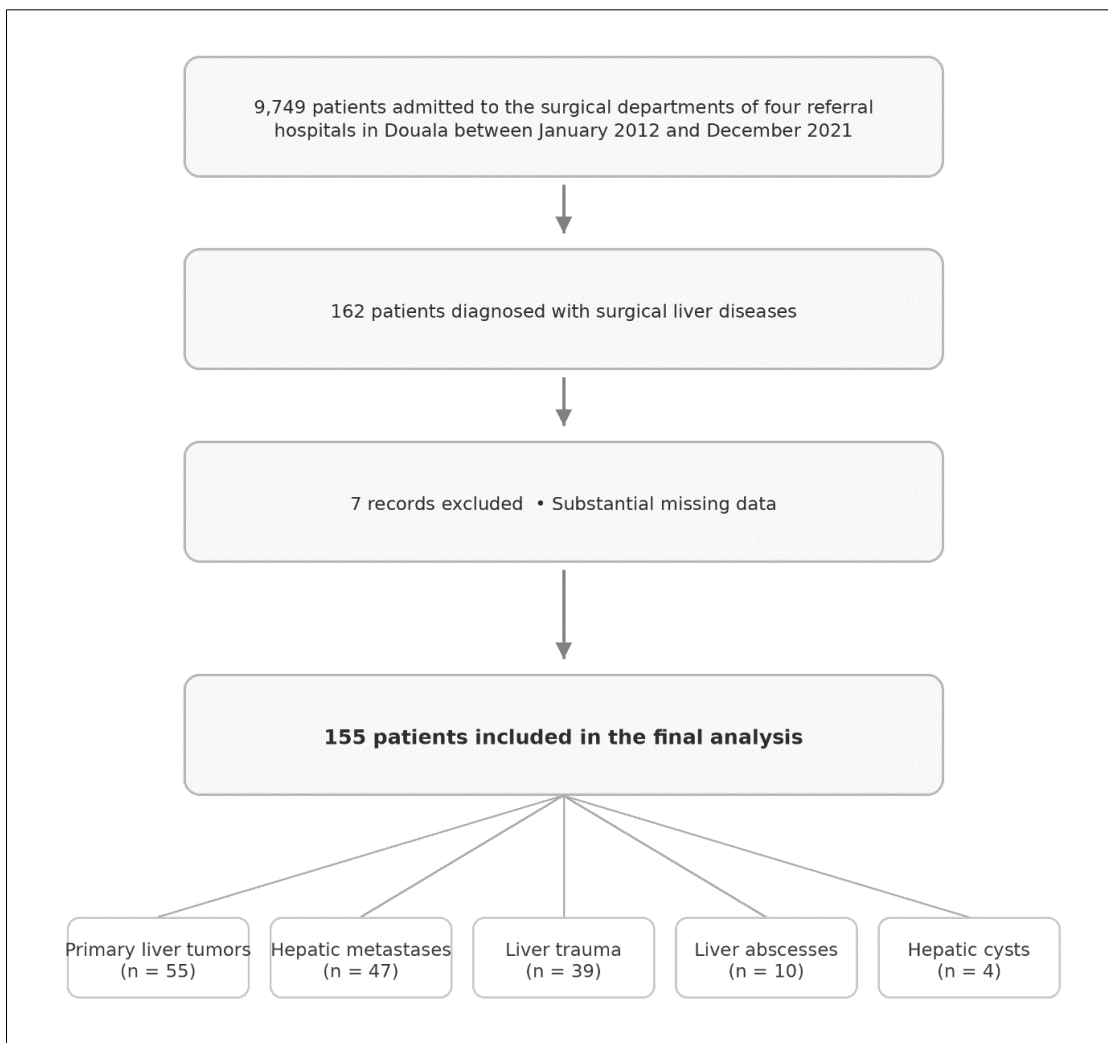


Figure 1: STROBE flow diagram illustrating patient selection and diagnostic distribution among patients with surgical liver diseases managed in four referral hospitals in Douala, Cameroon, between 2012 and 2021

### Epidemiological Characteristics

Patients were predominantly middle-aged adults, with the 31–40-year age group being the most represented.

Overall, 108 patients (69.7%) were male, yielding a male-to-female ratio of 2.35:1.

Most patients originated from the West Region of Cameroon.

Table 1: Sociodemographic characteristics and risk factors of patients with surgical liver diseases (n = 155).

Variable	n (%)
<b>Age group (years)</b>	
11–20	1 (0.6)
21–30	25 (16.1)
31–40	41 (26.5)
41–50	25 (16.1)
51–60	22 (14.2)

61–70	24 (15.5)
71–80	11 (7.1)
81–90	5 (3.2)
91–100	1 (0.6)
<b>Sex</b>	
Male	108 (69.7)
Female	47 (30.3)
Male-to-female ratio	2.35:1
<b>Medical history</b>	
Hypertension	22 (14.3)
Diabetes mellitus	11 (7.1)
Hepatitis B infection	13 (8.4)
Hepatitis C infection	17 (11.0)
HIV infection	5 (3.2)
Cirrhosis	6 (3.9)
<b>Lifestyle factors</b>	
Alcohol consumption	76 (49.4)
Tobacco use	12 (7.8)

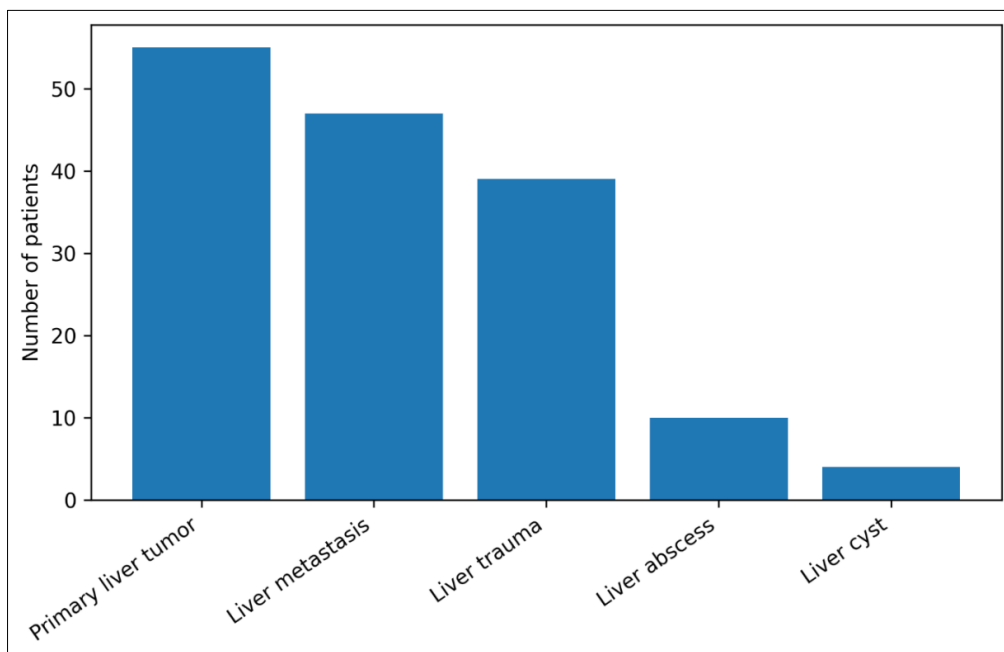
**Diagnostic Spectrum**

Primary liver tumors were the most frequent diagnosis, accounting for 55 cases (35.5%), followed by

hepatic metastases (47 cases; 30.3%), liver trauma (39 cases; 25.2%), liver abscesses (10 cases; 6.5%), and hepatic cysts (4 cases; 2.6%).

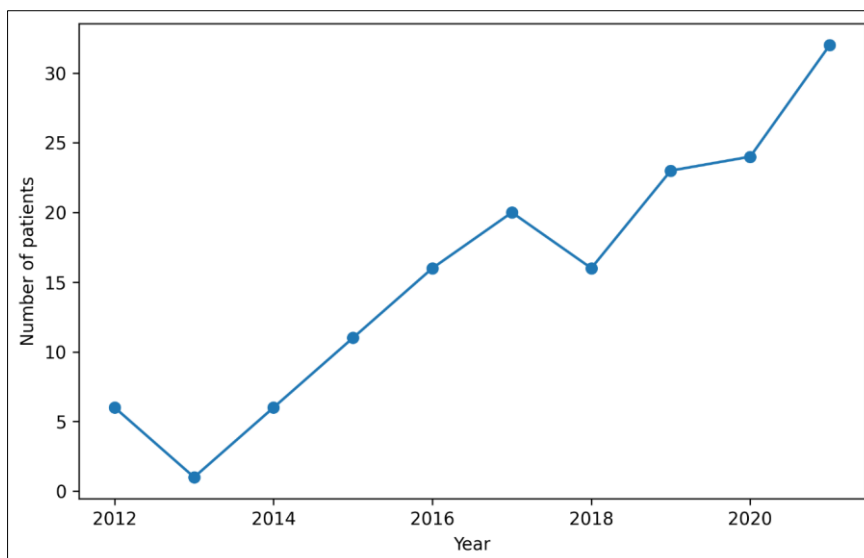
**Table 2: Distribution of surgical liver diseases**

Diagnosis	n	%
Primary liver tumors	55	35.5
Hepatic metastases	47	30.3
Liver trauma	39	25.2
Liver abscesses	10	6.5
Hepatic cysts	4	2.6
Total	155	100.0



**Figure 2: Distribution of surgical liver diseases (n = 155)**

The annual number of cases increased progressively over the study period, rising from fewer than 10 cases per year in 2012 to more than 25 cases in 2021.



**Figure 3: Annual trends of surgical liver diseases**

**Risk Factors and Medical History**

Hypertension was the most common comorbidity, affecting 22 patients (14.3%), followed by hepatitis C virus infection (11.0%), hepatitis B virus infection (8.4%), diabetes mellitus (7.1%), and HIV infection (3.2%).

Alcohol consumption was reported by 76 patients (49.4%), whereas tobacco use was reported by 12 patients (7.8%).

Patients with primary liver tumors more frequently had chronic viral hepatitis and cirrhosis.

**Clinical Presentation**

Abdominal pain was the predominant presenting symptom, reported by 128 patients (82.6%),

followed by abdominal distension (46.5%), chest pain (15.5%), nausea (15.5%), vomiting (12.3%), and dyspnea (9.7%).

Among patients with liver trauma, road traffic accidents accounted for 19 cases (48.7%), followed by stab wounds (38.5%) and gunshot injuries (10.3%).

Asthenia was present in 53.9% of patients, while anorexia was reported in 43.5%.

On physical examination, conjunctival pallor (51.0%), abdominal guarding (47.7%), hepatomegaly (41.3%), jaundice (29.0%), and ascites (23.9%) were the most common findings.

**Table 3: Clinical presentation of patients with surgical liver diseases**

Clinical feature	Total n (%)
Abdominal pain	128 (82.6)
Abdominal distension	72 (46.5)
Asthenia	84 (53.9)
Anorexia	67 (43.5)
Chest pain	24 (15.5)
Nausea	24 (15.5)
Vomiting	19 (12.3)
Dyspnea	15 (9.7)
Jaundice	45 (29.0)
Hepatomegaly	64 (41.3)
Ascites	37 (23.9)
Conjunctival pallor	79 (51.0)

**Laboratory Findings**

All patients underwent complete blood count testing.

Anemia was identified in 90 patients (58.1%), predominantly of moderate severity. Hyperleukocytosis

was observed mainly in patients with liver abscesses and traumatic liver injuries.

Abnormal liver function tests were more common among patients with primary liver tumors and hepatic metastases.

Alpha-fetoprotein levels were measured in 23 patients and exceeded 250 ng/mL in 20 cases (87.0%).

**Table 4: Laboratory abnormalities among patients with surgical liver diseases**

Laboratory parameter	Abnormal result, n (%)
Anemia	90 (58.1)
Hyperleukocytosis	32 (20.6)
Elevated CRP	42 (27.1)
Elevated ALT	45 (29.0)
Elevated AST	56 (36.1)
Elevated total bilirubin	22 (14.2)
AFP > 250 ng/mL*	20/23 (87.0)

**Therapeutic Management**

Overall, 72 patients (46.5%) underwent surgical treatment, while the remaining patients received medical, interventional, or palliative management.

Treatment strategies varied according to diagnosis, with surgical intervention being more frequent

among patients with traumatic liver injuries and symptomatic cysts.

Patients with primary liver tumors and hepatic metastases more commonly received systemic therapy or supportive care.

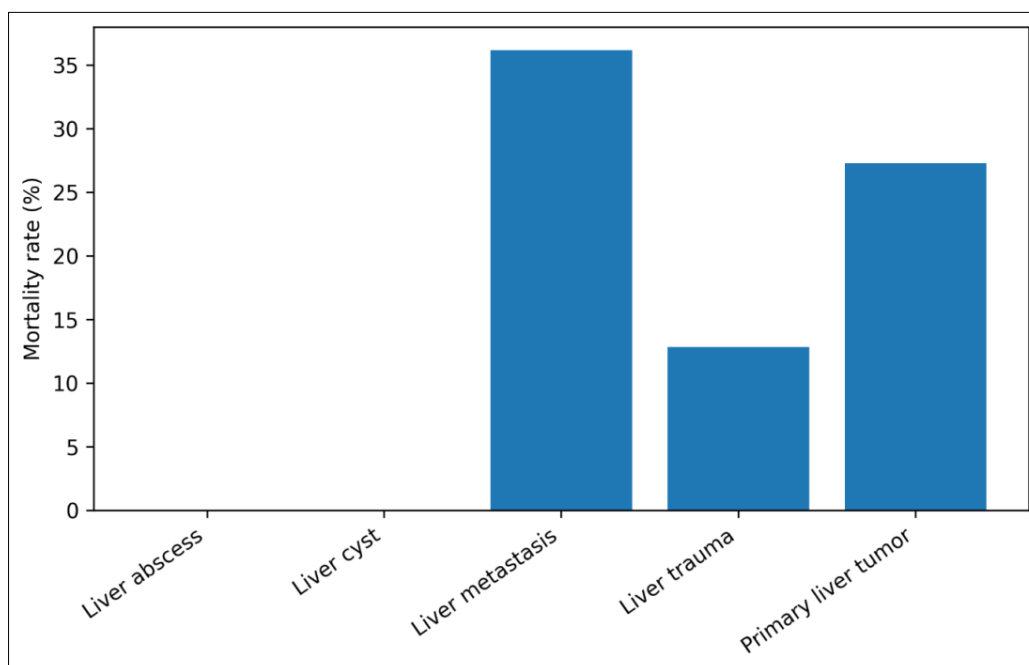
**Table 5: Therapeutic management and clinical outcomes among patients with surgical liver diseases (n = 155).**

Variable	n (%)
Surgical treatment	72 (46.5)
Non-surgical management	83 (53.5)
In-hospital complications	18 (11.6)
In-hospital mortality	37 (23.9)

**Clinical Outcomes**

The overall in-hospital mortality rate was 23.9% (37 deaths).

Mortality was highest among patients with malignant liver diseases, particularly those with primary liver tumors and hepatic metastases.



**Figure 4: In-hospital mortality rates according to the type of surgical liver disease**

Complications occurred in 18 patients (11.6%).

In univariate analysis, malignant liver disease, altered general condition at admission, anemia, abnormal

liver function tests, and absence of surgical treatment were associated with increased mortality.

Variables meeting the predefined significance threshold ( $p < 0.20$ ) were entered into a multivariable logistic regression model.

**Table 6: Univariate analysis of factors associated with in-hospital mortality among patients with surgical liver diseases (n = 155).**

Variable	Crude OR	95% CI	p-value
Tumoral disease*	4.39	1.60–12.07	0.003
Surgical treatment	0.12	0.04–0.34	<0.001
Male sex	0.75	0.34–1.64	0.539
Alcohol use	0.62	0.30–1.31	0.258
Tobacco use	0.27	0.03–2.17	0.296
Palliative treatment	3.01	1.30–6.98	0.017

\*Tumoral diseases included primary liver tumors and hepatic metastases.

Variables with a p-value < 0.20 in univariate analyses were considered eligible for inclusion in the multivariable logistic regression model.

Variables associated with in-hospital mortality in univariate analyses and those considered clinically relevant were entered into a multivariable logistic regression model.

**Table 7: Multivariable logistic regression analysis of factors independently associated with in-hospital mortality**

Variable	Adjusted OR (aOR)	95% CI	p-value
Age > 61 years	1.04	0.43–2.54	0.929
Tumoral disease*	3.05	1.05–8.87	0.040
Anemia at admission	3.09	1.28–7.48	0.012
Palliative treatment strategy†	2.72	1.06–6.96	0.037

**Abbreviations:** aOR, adjusted odds ratio; CI, confidence interval.

\* Tumoral diseases included primary liver tumors and hepatic metastases

† Reference category: non-palliative management.

**Model Performance:**

- Likelihood ratio test:  $p = 0.001$
- McFadden pseudo- $R^2 = 0.116$
- Hosmer–Lemeshow goodness-of-fit test:  $p = 0.900$
- Area under the ROC curve (AUC): 0.724

After adjustment for potential confounders, tumoral disease (aOR = 3.05, 95% CI: 1.05–8.87;  $p = 0.040$ ), anemia at admission (aOR = 3.09, 95% CI: 1.28–7.48;  $p = 0.012$ ), and palliative treatment strategy (aOR = 2.72, 95% CI: 1.06–6.96;  $p = 0.037$ ) remained independently associated with increased in-hospital mortality. Age > 60 years was not independently associated with mortality. 61 years was not independently associated with mortality.

**DISCUSSION**

This multicenter study provides one of the first comprehensive overviews of the epidemiology, management strategies, and outcomes of surgical liver diseases in Cameroon and, more broadly, in Central Africa. Our findings demonstrate that surgical liver diseases represent a substantial burden in tertiary hospitals in Douala, with malignant conditions accounting for nearly two-thirds of cases and an overall in-hospital mortality rate of 23.9%.

The predominance of middle-aged male patients observed in this study is consistent with previous reports from sub-Saharan Africa and other low- and middle-income countries, where liver diseases disproportionately affect economically productive age groups [11-14]. Men accounted for 69.7% of cases, which may be explained by higher exposure to behavioral risk factors, including alcohol consumption and occupational hazards associated with traumatic injuries. Similar male predominance has been reported in studies on hepatocellular carcinoma and liver trauma worldwide [5-15].

Primary liver tumors represented the leading diagnosis, followed by hepatic metastases and liver trauma. This pattern contrasts with reports from high-income countries, where benign hepatobiliary conditions and metastatic liver disease often predominate in surgical practice [6, 7]. The high proportion of primary liver tumors in our cohort likely reflects the persistent endemicity of chronic hepatitis B and C infections in Cameroon, where HBV prevalence remains between 8% and 12% among adults [13]. In our study, hepatitis B and C infections were identified in 8.4% and 11.0% of patients, respectively, supporting the well-established association between chronic viral hepatitis and hepatocellular carcinoma [4-17].

The substantial burden of hepatic metastases observed in our study may reflect the ongoing epidemiological transition occurring across sub-Saharan Africa, characterized by increasing incidence of colorectal, pancreatic, gastric, and breast cancers [14]. Advances in diagnostic imaging and improved access to

oncological services have also likely contributed to increased detection of secondary liver lesions. However, unlike high-income settings where liver metastases are increasingly managed through multimodal approaches involving hepatic resection, ablation, and systemic therapy, access to specialized hepatobiliary procedures remains limited in most African countries [6-18].

Traumatic liver injuries accounted for one-quarter of all surgical liver diseases, with road traffic accidents representing the leading mechanism of injury. This finding aligns with recent evidence highlighting the growing burden of trauma in sub-Saharan Africa due to rapid urbanization, increased motorization, and inadequate road safety measures [8-19]. The predominance of blunt trauma observed in our study underscores the need to strengthen trauma systems, prehospital care, and emergency surgical capacity in Cameroon.

Abdominal pain, abdominal distension, and constitutional symptoms were the most common presenting complaints, whereas anemia was identified in more than half of patients. These findings likely reflect delayed healthcare-seeking behavior and advanced disease at presentation, which remain major challenges in resource-limited settings. Limited access to screening programs, advanced imaging modalities, and specialized hepatobiliary expertise contributes to diagnostic delays and restricts opportunities for curative treatment [14-16].

Although nearly half of the patients underwent surgical management, treatment strategies varied considerably according to the underlying pathology. Patients with malignant liver diseases were more frequently managed with palliative approaches because of advanced-stage presentation and limited access to specialized interventions. This therapeutic gap has been widely reported across sub-Saharan Africa and reflects persistent inequities in access to cancer care infrastructure, including interventional radiology, liver transplantation programs, and multidisciplinary tumor boards [11-16].

The overall in-hospital mortality rate of 23.9% observed in this study is considerably higher than rates reported in high-income countries but comparable to those described in other resource-constrained settings [10-14]. Importantly, multivariable analysis identified tumoral disease, anemia at admission, and palliative treatment strategy as independent predictors of mortality. These findings suggest that mortality is driven not only by disease severity but also by delayed diagnosis and restricted access to definitive treatment options.

Patients with malignant liver diseases had a threefold increased risk of death, highlighting the urgent need for strengthened viral hepatitis prevention, surveillance, and early detection programs, in line with recent international recommendations for hepatocellular

carcinoma management [20]. Likewise, the independent association between anemia and mortality emphasizes the importance of optimizing perioperative and supportive care pathways. The increased mortality observed among patients receiving palliative treatment likely reflects advanced disease stage rather than the effect of treatment itself and should therefore be interpreted cautiously.

Our findings have important implications for health policy and surgical systems strengthening in Cameroon and similar settings [21]. Expanding HBV vaccination coverage, implementing systematic screening for chronic viral hepatitis, improving access to cross-sectional imaging, and developing multidisciplinary hepatobiliary units could substantially improve outcomes. Investments in trauma prevention strategies and emergency surgical capacity are equally essential.

This study has several strengths. It represents one of the largest multicenter analyses of surgical liver diseases conducted in Central Africa and provides a comprehensive overview of both malignant and non-malignant conditions over a 10-year period. The multicenter design enhances the external validity of our findings and offers valuable insights into real-world practice in resource-limited environments.

However, several limitations should be acknowledged. First, the retrospective design exposes the study to information bias and missing data. Second, the study was conducted exclusively in tertiary referral hospitals, which may have led to referral bias and limited the generalizability of the findings to primary and secondary healthcare facilities. Third, the absence of long-term follow-up data prevented assessment of survival beyond hospital discharge. Finally, the limited availability of advanced diagnostic and therapeutic modalities may have influenced treatment allocation and outcomes.

Future prospective studies integrating standardized data collection, long-term follow-up, and broader geographic representation are needed to better characterize the burden of surgical liver diseases in sub-Saharan Africa. Establishing national hepatobiliary registries and strengthening regional research collaborations could further support evidence-based policy development and resource allocation.

## CONCLUSION

Surgical liver diseases represent a substantial and evolving health burden in referral hospitals in Douala, Cameroon. Malignant conditions, particularly primary liver tumors and hepatic metastases, accounted for nearly two-thirds of cases and were associated with high in-hospital mortality.

Patients frequently presented at advanced stages of disease, with anemia, tumoral disease, and palliative treatment strategy emerging as independent predictors of mortality. These findings underscore persistent challenges related to delayed diagnosis, limited access to specialized hepatobiliary care, and restricted availability of advanced therapeutic options in resource-limited settings.

Strengthening viral hepatitis prevention and screening programs, improving access to diagnostic imaging and multidisciplinary hepatobiliary services, and expanding trauma prevention initiatives are essential to reduce the burden of surgical liver diseases and improve patient outcomes in sub-Saharan Africa.

Prospective multicenter studies and the establishment of national hepatobiliary registries are warranted to better characterize disease patterns and guide evidence-based healthcare planning.

## REFERENCES

- Asrani SK, Devarbhavi H, Eaton J, Kamath PS. Burden of liver diseases in the world. *J Hepatol*. 2019;70(1):151-71.
- Karlsen TH, Sheron N, Zelber-Sagi S, Carrieri P, Dusheiko G, Bugianesi E, et al. The EASL-Lancet Liver Commission: protecting the next generation of Europeans against liver disease complications and premature mortality. *Lancet*. 2022;399(10319):61-116.
- Bray F, Laversanne M, Sung H, Ferlay J, Siegel RL, Soerjomataram I, et al. Global cancer statistics 2022: GLOBOCAN estimates of incidence and mortality worldwide for 36 cancers in 185 countries. *CA Cancer J Clin*. 2024;74(3):229-63.
- Llovet JM, Kelley RK, Villanueva A, Singal AG, Pikarsky E, Roayaie S, et al. Hepatocellular carcinoma. *Nat Rev Dis Primers*. 2021;7(1):6.
- McGlynn KA, Petrick JL, El-Serag HB. Epidemiology of hepatocellular carcinoma. *Hepatology*. 2021;73(S1):4-13.
- Adam R, de Gramont A, Figueras J, Guthrie A, Kokudo N, Kunstlinger F, et al. Managing synchronous liver metastases from colorectal cancer: a multidisciplinary international consensus. *Cancer Treat Rev*. 2015;41(9):729-41.
- Van Cutsem E, Cervantes A, Adam R, Sobrero A, Van Krieken JH, Aderka D, et al. ESMO consensus guidelines for the management of patients with metastatic colorectal cancer. *Ann Oncol*. 2016;27(8):1386-422.
- Coccolini F, Coimbra R, Ordonez C, Kluger Y, Vega F, Moore EE, et al. Liver trauma: WSES 2020 guidelines. *World J Emerg Surg*. 2020;15:24.
- Ntiringanya F, Byiringiro JC, Ntakiyiruta G, Mukeshimana M. Epidemiology of abdominal trauma in sub-Saharan Africa: a systematic review. *World J Emerg Surg*. 2023;18(1):11.
- Serraino C, Elia C, Bracco C, Rinaldi G, Pomero F, Silvestri A, et al. Characteristics and management of pyogenic liver abscess: a European experience. *Medicine (Baltimore)*. 2018;97(19):e0628.
- Spearman CW, Dusheiko GM, Hellard M, Sonderup M. Hepatitis B in sub-Saharan Africa: strategies to achieve the 2030 elimination targets. *Lancet Gastroenterol Hepatol*. 2017;2(12):900-9.
- Cooke GS, Andrieux-Meyer I, Applegate TL, Atun R, Burry JR, Cheinquer H, et al. Accelerating the elimination of viral hepatitis: a Lancet Gastroenterology & Hepatology Commission. *Lancet Gastroenterol Hepatol*. 2019;4(2):135-84.
- Bigna JJ, Amougou MA, Asangbeh SL, Kenne AM. Seroprevalence of hepatitis B virus infection in Cameroon: a systematic review and meta-analysis. *BMJ Open*. 2017;7(6):e015298.
- Jaka H, Mchembe MD, Rambau PF, Chalya PL. Hepatobiliary diseases in sub-Saharan Africa: changing patterns and emerging challenges. *BMC Gastroenterol*. 2021;21:186.
- Yang JD, Hainaut P, Gores GJ, Amadou A, Plymoth A, Roberts LR. A global view of hepatocellular carcinoma: trends, risk, prevention and management. *Nat Rev Gastroenterol Hepatol*. 2019;16(10):589-604.
- Ofori-Asenso R, Agyeman AA. Hepatobiliary surgical care in Africa: challenges and opportunities. *Lancet Gastroenterol Hepatol*. 2020;5(7):623-5.
- Yang JD, Mohamed EA, Aziz AOA, Shousha HI, Hashem MB, Nabeel MM, et al. Characteristics, management, and outcomes of hepatocellular carcinoma in Africa: a multicountry observational study. *JAMA Netw Open*. 2019;2(4):e193774.
- Cervantes A, Adam R, Roselló S, Arnold D, Normanno N, Taïeb J, et al. Metastatic colorectal cancer: ESMO Clinical Practice Guideline for diagnosis, treatment and follow-up. *Ann Oncol*. 2023;34(1):10-32.
- GBD 2021 Diseases and Injuries Collaborators. Global burden of injuries and risk factors, 1990-2021: a systematic analysis for the Global Burden of Disease Study 2021. *Lancet*. 2024;403(10440):2160-2201
- European Association for the Study of the Liver. EASL Clinical Practice Guidelines on the management of hepatocellular carcinoma. *J Hepatol*. 2024;80(4):e293-e382.
- Meara JG, Leather AJM, Hagander L, Alkire BC, Alonso N, Ameh EA, et al. Global Surgery 2030: evidence and solutions for achieving health, welfare, and economic development. *Lancet*. 2015;386(9993):569-624.

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