

## Management of Acute Lithiasic Cholecystitis in a Secondary Hospital: Somine Dolo Hospital in Mopti Epidemiological Aspects, Risk Factors, Diagnosis, Treatment and Evolution

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### Summary

Acute cholecystitis can now have an impact worthy of interest in black Africa, although it was considered rare in the past. Several surgical works currently published in Africa have demonstrated this.

The objective of this work was therefore to determine the hospital frequency in the department of general surgery of acute lithiasic cholecystitis, to describe the diagnostic and therapeutic aspects, to describe the surgical follow-up and to evaluate the cost of management.

This was a retrospective and prospective study that was carried out from 1 January 2016 to 31 December 2018 in the general surgery department of the Sominé Dolo Hospital in Mopti. It involved 46 patients including 16 men and 30 women with an average age of 50.64 years  $\pm$  14.97 and sex-ratio of 0.54, having been operated by intraoperatively confirmed acute cholecystitis laparotomy.

The annual frequency was 15.33 cases/year. The defense sign in right hypochondrium was found in all our patients. Cholecystectomy was the rule of surgical treatment in the absence of the laparoscopy spine, and non-training of surgeons in coeliosurgery, all our patients were operated by conventional surgery. Antibiotic prophylaxis and antibiotic therapy were performed in all our patients. Vesicular bed drainage 45(97.8%) was the main surgical procedure associated with cholecystectomy Operative soot was simple in 84.8% of our patients. The morbidity rate was 13.04%; the mortality rate was 2.17%.

The average cost of care was 129,800 FCFA ( $\pm 9650$  FCFA) ie  $197.66 \pm 14.69$  euros.

**Keywords:** Acute lithiasic cholecystitis; complications; classical surgery; Sominé Dolo Hospital of Mopti

## Introduction

Acute lithiasic cholecystitis is an inflammatory lesion of the gallbladder, whether or not due to obstruction of the cystic duct by a stone [1].

It is a pathology considered rare in Africa but quite common in developed countries. It represents a medical-surgical emergency.

In the West, 10 to 20% of the general population suffer from cholelithiasis and 20% of cholelithiasis is complicated by acute cholecystitis: this is the most common complication of vesicular lithiasis. It is in 90% of cases secondary to a calculous isolation at the level of the neck of the gallbladder or the cystic and lithiasic duct in 10% of cases [2].

- In Ireland, Cheema et Al. Performed 132 cholecystectomy for acute cholecystitis in five years [3].
- In the United States, 30 million Americans are affected by cholelithiasis per year and this is the cause of more than 750,000 cholecystectomy per year [4].

The change in the eating habits of black Africans, the appearance of oral contraception and the longer survival of patients with hemolytic diseases such as sickle cell disease may have recently led to an increase in the frequency of this pathology [5].

The popularization of ultrasound in our complementary examinations has strongly played on the frequency of discovery of vesicular stones often silent or symptomatic pauci.

- In Niger, Sani et al operated on 39 patients for acute cholecystitis at the National Hospital in Niamey in 6 years [6].
- In Nigeria, 46 cases of acute cholecystitis have been collected in five years [7].
- In Gabon in 2008, 25 patients received a cholecystectomy [8].
- In Mali:

Soumare et al. in 2003 performed 30 cholecystectomy under laparoscopy in the "A" surgery department at the POINT G UNIVERSITY HOSPITAL [9].

- SANOGO in 2011 found 67 cases of acute lithiasic cholecystitis operated or 28.39% of cases of gallstones operated in 9 years in the surgery department "A"[10].
- KEITA in 2011 found 87 cases of acute lithiasic cholecystitis operated in 11 years in the general surgery department CHU Gabriel TOURE [11].

New trans orificial endoscopic techniques (natural transluminal orifice endoscopic surgery [NOTES]) have recently been developed. The aim of this innovation is essentially to avoid abdominal parietal trauma related to trocars and extraction of the operating room. These include vaginal or transgastric cholecystectomy [12].

The therapeutic indications for vesicular lithiasis have been the subject of American and European consensus conferences and have concluded to offer cholecystectomy to patients with symptomatic and complicated vesicular lithiasis [13].

Many studies have shown that early surgery within 5 days reduces the length of hospitalization [14].

The absence of a study in the Hospital of Mopti (Secondary Hospital) on vesicular lithiasis led us to initiate this study.

The objectives of this work were to study acute lithiasic cholecystitis in the general surgery department of the Sominé DOLO Hospital in Mopti; to determine the hospital frequency of acute lithiasic cholecystitis; to identify risk factors; to describe clinical and therapeutic aspects; to describe the consequences of treatment and to evaluate the cost of surgical treatment.

## **Patients and Methods**

This was a retrospective and prospective study of 3 years from January 2016 to December 2018 carried out in the general surgery department of the Sominé Dolo Hospital in Mopti. Patients were identified from clinical records and operative report records.

We included in the study all patients operated on for acute lithiasic cholecystitis in the general surgery department.

Excluded from the study were all patients operated on for other biliary pathologies and cases of acute cholecystitis not operated.

The survey sheet consisted of data on marital status, reason for consultation, history with risk factors, clinical and para-clinical examinations, treatment and costs of care. Data collection was done from: consultation records, patient records (or observation sheets), operative report records, anesthesia records, anatomy-pathological records and home surveys (for records with a complete address of the patient) or during the appointments indicated on the patient's discharge report. This data was then recorded on our survey sheet.

The follow-up of patients with hindsight of 1 month was done on "appointment" mentioned on the discharge report of each patient. For the long-term follow-up, we proceeded either by the classic "appointment" system, or by home visit for patients residing in Mopti with full address, or by contact person or by landline and mobile phone.

Data entry and analysis were done on the EPI info 6 software. 0 and the results tables were developed on Excel and then transferred to World 2010.

Our results were analyzed descriptively and correlationally. The statistical tests used were the Khi 2 with a significance threshold  $P < 0.05$  and the exact Fischer.

## **Results**

During the study period, we collected and operated on 46 patients of acute lithiasic cholecystitis in the general surgery department out of 10021 surgical consultations ie 0.4% of consultations, 5409 surgical interventions ie 0.8% of surgical interventions and 9550 hospitalizations or 0.5% of all hospitalizations;

The average annual frequency of acute lithiasic cholecystitis was 15.33 cases in the department of general surgery. Table 1 shows the distribution of patients by age.

The female sex was most prevalent in our series (Figure 1).

The most of our patients were housewives in 50% of cases, came from the Mopti district in 58.7% of cases and were illiterate in 52.2% of cases.

The settled surgery was the most practiced with 37 cases or 80.4% which were acute lithiasic cholecystitis whose symptomatology dated back less than 72 hours against 9 cases of emergency surgery including a pyocholecyst complicated by peritonitis. More than half of our patents have been referred by doctors, i.e. 60.9% of cases.

Abdominal pain, chills and vomiting were the most represented symptoms 100%, 47.8% and 47.7%, respectively. Pain sat to hypochondrium right and progressive onset in 95.7% of cases with strap irradiation in 73.91%or towards the back in 21.7% of cases and was moderate in 99.1% of cases. The general signs were dominated by a temperature above 38.50°C. Pain was triggered by fatty foods in 56.5% of cases and unspecified in 54.5% of cases.

The physical examination found signs represented by Figure 2 dominated by the defense in 65% of cases.

The risk factors represented by Figure 3 are dominated by the female sex with 65.2% of cases. We recorded 12 associated pathologies (26.1%) divided into sickle cell disease (8.7%), peptic ulcer (4.3%), diabetes (4.3%), high blood pressure (6.5%) and appendicitis (2.2%). Out of our series, 95.65% patients had a Karnofsky index between 90 and 80. The assessment of risk factors is shown in Table 2.

Our patients were classified as ASAI and ASAI with 97.8% and 2.2% respectively.

All our patients (46) benefited from abdominal ultrasound, the results of which are recorded in Table 3.

Neutrophil hyper leukocytosis was found in all our patients. Transaminase was elevated in 33.3% of our patients and 90.7% had anormal Emmel test.

The way first was the right subcostal incision in 95.6% in our series.

Our series was dominated by regulated surgery with 37 patients (80.4%) against 9 patients or 19.6% operated in emergency including 2 pytolcysts.

Anterograde cholecystectomy was the most used technique with 54.3% of cases. The gallbladder had a thickened and inflammatory wall and was lithiasic in 84.8% of cases.

The diagnosis of acute lithiasic cholecystitis was confirmed intraoperatively in 93.5% of cases and 18 or 39.1% had 15 stones. Only one patient experienced an intraoperative complication of bleeding type. The average duration of intervention was 64.04 minutes with extremes of 45 and 120 minutes.

We used in 44 patients ceftriazone-based antibiotic prophylaxis 2 grams intravenously and 1 gram of metronidazole as an infusion before induction of anaesthesia; the 2 patients operated for pyopolecystitis benefited from curative antibiotic therapy based on ceftriazone 2 grams per day and 1 gram of metronidazole morning and evening for 7 days.

The surgical follow-up was simple in 39 patients or 84.7%, we observed abscess of the wall in 6 patients ie 13% and a death in 2.2% case. The average length of hospitalization was 10.3 days with extremes of 5 and 28 days. The average cost of the plug was 129,800 FCFA ( $\pm 9650$  FCFA) ie  $197.66 \pm 14.69$  euros.

<i>Age in Years</i>	<i>Actual</i>	<i>Percentage</i>
20-30	7	15.2
31-40	4	8.7
41-50	9	19.6
51-60	14	30.4
61-70	8	17.4
71-80	4	8.7
Total	46	100,0

**Table 1:** Distribution of patients according to age group.

The mean age was 50.6 years with a standard deviation of 14.97. Table 1

The mode was between 51-60 years. The extreme ages were 20 and 73 years.

<b>Risk factors</b>		<b>Actual</b>	<b>Percentage</b>	<b>When 2</b>	<b>P</b>
<b>Sex</b>	<b>Feminine</b>	30	65,2	8,52	P=0,003509
	<b>Masculin</b>	16	34,8		
<b>Multiparité</b>	<b>Yes</b>	23	76,67	17,07	P=0,000036
	<b>Not</b>	7	23,33		
<b>Contraception</b>	<b>Yes</b>	10	33,33	6,67	P=0,009823
	<b>Not</b>	20	66,67		
<b>Age</b>	<b>≥40 years</b>	35	76,1	25,04	P=0,000000
	<b>≤40 years</b>	11	23,9		
<b>Obesity</b>	<b>Yes</b>	12	26,1	21,00	P=0,000001
	<b>Not</b>	34	73,9		
<b>Sickle-cell anemia</b>	<b>Yes</b>	4	8,7	62,78	P=0,000000
	<b>Not</b>	42	91,3		

**Table 2:** Distribution of patients based on risk factor assessment.

<b>Abnormality on ultrasound</b>	<b>Actual</b>	<b>Percentage</b>
Thickening of the vesicular wall + stones	46	100
Thickening of the vesicular wall + ultrasound Murphy's sign + stones	21	45,6
Peri-vesicular edema + bile mud (sludge)	2	4,3

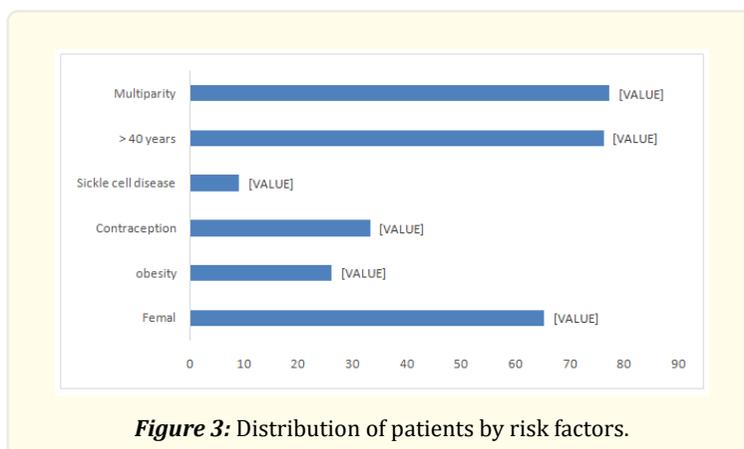
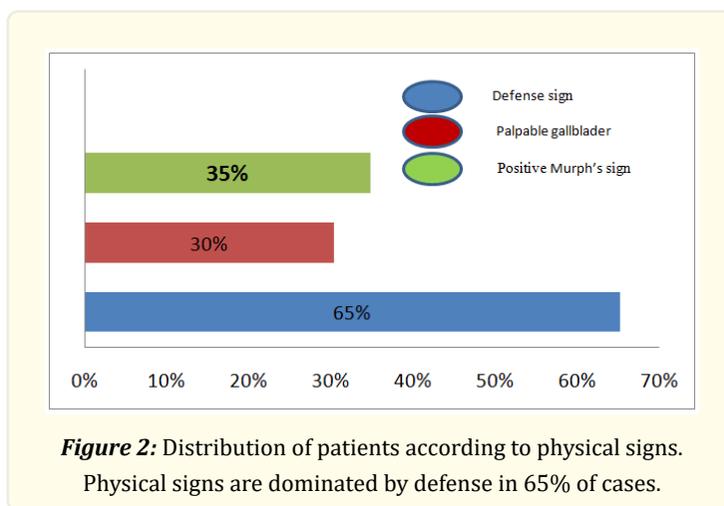
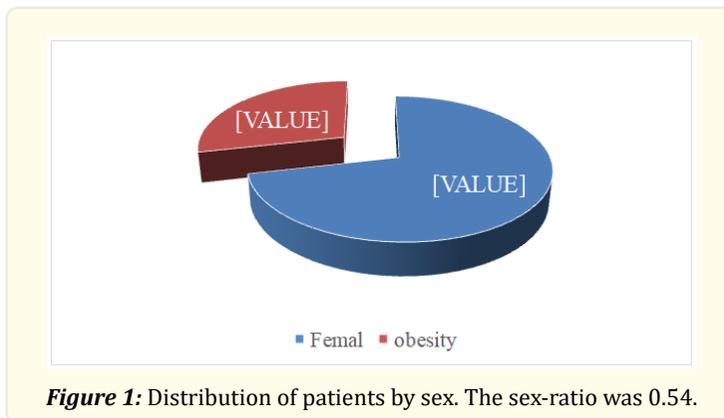
**Table 3:** Distribution of patients according to ultrasound abnormalities.

All our patients (46) benefited from abdominal ultrasound.

<b>Authors</b>	<b>N</b>	<b>Number of cases/year</b>
RAHMAN, Nigeria 2004, [7]	46	9,2
HUANG, Singapore 2006, [43]	133	29,55
DANIAK, USA 2007, [19]	88	-
WINBLADH, 2009, [42]	622	207,33
KEITA, Mali 2010 [11]	87	8
Our 2018 series	46	6

**Table 4:** Hospital frequency of acute cholecystitis according to the authors.

The frequency of acute lithiasic cholecystitis in Africa has been increasing in recent years [8, 33].



### Iconography



### Comments and Discussion

This was a retrospective study from January 2016 to December 2018. It involved 46 patients operated on in the general surgery department of the Sominé DOLO Hospital in Mopti.

Table 4 shows an increasing of the hospital frequency of acute lithiasic cholecystitis in Sominé Dolo hospital according to the other authors in Africa [8, 33].

With an average annual frequency of 15.3 cases / year we found that acute lithiasic cholecystitis is no longer a rare condition in surgical departments. This increasing frequency of acute lithiasic cholecystitis is explained by several factors: the change in eating habits, and the frequency of ultrasound which is often required for any abdominal pain syndrome. We report an average age of 50.6 with no difference with that of DANIAK in the USA [19] and statistically lower than that reported by ANDERS in SWEDEN [42] with 58.6 and GOLEA, ROMANIA [30] with 59.3; this could be explained by the higher life expectancy among Europeans. Gallstones are rare before the age of 10. The prevalence and incidence of acute lithiasic cholecystitis increases with age [38, 39].

The frequency of acute lithiasic cholecystitis is high in adult women and this would be due to the action of female sex hormones, the use of oral contraceptives, estrogen therapy and pregnancy [35, 36].

Acute lithiasic cholecystitis is 2 to 3 times more common in women than in men in both the West and Africa [6, 8, 33].

We found no statistically significant difference between our rate and that found in the literature [6, 8, 33].

Several factors are noted in the literature. Among these factors we found the following factors in our patients:

#### Obesity

Obesity is a risk factor in the occurrence of cholelithiasis because the secretion of cholesterol in bile is high in obese people, which doubles the prevalence of acute lithiasic cholecystitis in these people [17, 34].

The proportion of obese patients in our 26.1% series is higher than that of the KEITA series [11] 7.1 and CHEN [34] 7.3% ( $p < 0.05$ ).

This proportion appears to be lower than that of SAFER [17]. The body mass index (BMI) has been our benchmark for determining obesity. All patients with a BMI  $\geq 30$  kg/m<sup>2</sup> were classified as obese.

### *Hemoglobinopathies*

According to the BOND study in Great Britain, half of patients with sickle cell disease (49.5%) develop cholelithiasis. We observed 8.7% sickle cell disease. On the other hand, MEHINTO has regained a rate of 15.8%. This low rate of cholelithiasis may be related to the high incidence of asymptomatic forms of cholelithiasis in sickle cell disease [41].

### *Multiparity*

Multiparity would be a risk factor because during pregnancy, physiological changes would contribute to the formation of vesicular stones: on the one hand the cholesterol saturation of hepatic and vesicular bile; on the other hand, a slowing of vesicular motor skills [40]. In our series, 50% of women were multiparous. This rate is not statistically different from that reported by KEITA [11] in Mali and TRAORE in Burkina Faso ( $p > 0.05$ ). However, CHEN [34] and SAFER [17] have returned to a low rate.

### *Oral contraception*

In our observations, 21.7% of our patients used estroprogestogens. This rate is not statistically different from that reported by KEITA [11] in Mali and CHEN [34] in Taiwan.

Diabetes, sickle cell disease and hypertension have been the associated pathologies, they are considered risk factors for cholelithiasis [38, 39]. By increasing cholesterol in bile, it is insulin and not diabetes itself, that promotes lithogenesis [39]. The rate of patients with diabetes, which is 4.3% in our study, is not statistically different from those found in the series of the other authors ( $p > 0.05$ ).

High blood pressure is not a risk factor for cholelithiasis. It was found in 6.5% of our patients. This rate is not statistically different from that of MEHINTO in Benin 6.5% [33] and THERRA C in Mali [47]. The presence of these pathologies is due to their high frequency.

Hepatic colic, defense and Murphy's sign were found in the different series at rates that showed no statistically significant difference with our series ( $p > 0.05$ ) [47, 48].

Fever occurred in a greater number (80.4%) in our series than in the American series (23%) [48]. This could be related to the delay in diagnosis.

Liver assessment in symptomatic vesicular lithiasis is usually normal. But in the period of hepatic colic, it may be slightly disturbed.

We found hypertransaminasemia in 2 patients or 4.35% against 15.7 to 37.1% in the literature [11, 19].

Clinical manifestations of cholecystitis were most often accompanied by neutrophil polynuclear hyperleukocytosis [19]. This sign of infection was found in 100% (46 patients) this rate is no different in the American series [19].

All our patients benefited from the ultrasound. It has a sensitivity of 95.6% and a specificity of 75% for cholecystitis [2]. It was sufficient to suspect acute lithiasic cholecystitis in our study and those of the other authors [6, 11, 19, 49, 50].

The average duration of intervention was 64.04 minutes in our series comparable to that of the KEITA series in Mali and the Korean series which was 60.5 minutes. Treatment of acute lithiasic cholecystitis is medical-surgical. Better results are obtained if patients are operated on early (upon admission if the duration of symptomatology does not exceed 72 hours) [19]. On the other hand, if emergency surgical management is delayed (beyond 72 hours) it increases the risk of pre and postoperative complications, an increase in hospital stay and a high rate of conversion during laparoscopy, apart from complications by biliary peritonitis laparoscopy if available remains the surgical technique of choice [19, 24, 31, 51, 52].

The hospital stay was longer in our series as in the series KEITA in Mali [11] and in the Nigerien series [6]. On the other hand, it is short (3.7 days) in European series where laparoscopy is more developed [24, 31, 51, 52]. The long duration of stay is due to the fact that patients consult late with duration of evolution of the symptomatology greater than 4 days and requiring delayed surgery.

Surgical site infection was the main morbidity and our morbidity rate is identical to that found in the literature [24, 44, 46, 52].

Mortality depends on management and clinical form. It is 0 to 4% according to the literature [24, 25]. The mortality rate of this study is not statistically different from that found in the literature (2.17%).

The average cost of care was 129,800 FCFA ( $\pm 9650$  FCFA) ie  $197.66 \pm 14.69$  euros. For acute lithiasic cholecystitis.

This cost is well above the Malian SMIG which was about 28,000 FCFA. It was partly increased by the occurrence of complications. The coverage is in the majority of cases, at the expense of the patient and/or his parents and insurance for insured patients. Universal health insurance can improve outcomes.

## Conclusion

Acute lithiasic cholecystitis is a pathology of young adults with a female predominance. It is now experiencing a fairly significant impact in black Africa. The number of patients hospitalized for acute lithiasic cholecystitis has gradually increased since 2006 in the general surgery department at sominé DOLO Hospital in Mopti due to the advent of ultrasound for an annual frequency of 13.33 cases per year.

Cholecystectomy is the radical treatment of this pathology. Conventional surgical treatment by laparotomy is the only one available at the Sominé DOLO Hospital in Mopti although coeliosurgery remains the least invasive method with better results. From January 2016 to December 2018, 46 cholecystectomy were performed by this route first.

The promotion of new methods is necessary through the training of the surgical team in coeliosurgery and the acquisition of columns to improve the management of patients by a less invasive surgery.

## NB

The authors do not report any conflict of interest.

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