

Liver Abscess: Diagnostic, Therapeutic and Progressive Aspects in the Hepato-Gastroenterology Department of Sourô Sanou University Hospital

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Abstract

Introduction: Liver abscess is an infection of the hepatic parenchyma that requires early diagnosis and effective management. The objective of this study was to describe the diagnostic, therapeutic and progressive aspects of liver abscesses at the Sourô Sanou University Hospital (CHUSS). **Methodology:** This was a descriptive cross-sectional study, with retrospective data collection, conducted from January 1, 2018 to December 31, 2021 in the hepato-gastroenterology department of the CHUSS. Patients who had a liver abscess confirmed by liver ultrasound and were hospitalized during the study period were included. Primary abscessed cancers and hydatid or superinfected cysts were not included. **Results:** During the study period, 1767 patients were hospitalized and 23 cases of abscess included. There were 17 men, a sex ratio of 2.8. The mean age was 37.3 ± 16.2 years. The predominant medical histories and pathological conditions were intestinal amoebiasis and chronic alcohol consumption, respectively in 13 (56.5%) and 11 (47.8%) patients. A Fontan triad was observed in 21 patients (91.3%) and a deterioration in general condition in more than 50% of patients. A hyperleukocytosis was observed in all patients, and an elevated C-reactive protein was found in 18 patients (78.3%). On ultrasound, a single abscess or more than two pockets were revealed in 9 and 6 patients respectively, located in the majority of cases (21 patients) in the right lobe. Imidazoles, alone or in combination with a cephalosporin, were administered. Ultrasound-guided or surgical drainage was performed in 12 (52.2%) and 02 patients respectively. The outcome was favorable in 19 patients (82.6%) and the outcome was fatal in 4 others. **Conclusion:** Liver abscess remains a

potentially serious pathology in our context. Only early diagnosis with appropriate treatment can achieve excellent results.

Keywords

Liver Abscess, Fontan Triad, Hepatic Ultrasound, Therapeutic, Progressive, Burkina Faso

1. Introduction

Hepatic abscess is the consequence of a localized infection of the hepatic parenchyma, leading to the formation of an inflammatory infiltrate, necrosis and possibly a collection of pus [1]. Liver abscesses are rare conditions that can be serious. This rarity is reported by several studies in Africa, with an annual variability of 1.3 cases to more than 5 cases [2]-[5]. Their prevalence and incidence have increased in recent years due to the increase in life expectancy of populations, progress in pancreatic and hepatobiliary surgery in cancerology and transplantation, the development of interventional radiology and the increase in immunodepression factors such as human immunodeficiency virus (HIV) infection, diabetes and chronic alcoholism [6] [7].

These are infections that can be caused by bacteria and/or parasites, or more rarely fungi. Amoebic origin is more common in Africa and South-West Asia [7]-[9], while pyogenic abscesses are more common in developed countries [6] [10]. The clinical and biological signs are often non-specific, requiring for their diagnosis to gather clinical (painful hepatomegaly in a feverish context), biological (systemic inflammatory response syndrome) and imaging (ultrasound or computed tomography) arguments [11]. Among morphological examinations, ultrasound holds a preponderant place in making it possible to make a positive diagnosis, to guide the etiological diagnosis, to assist in treatment by guiding sampling and drainage and to monitor the involution of fluid collections [1] [12].

Medical treatment alone, consisting of an antiparasitic drug, metronidazole, with or without antibiotics, is often effective in achieving a cure. However, in some cases, ultrasound-guided drainage is of great benefit and surgery may be necessary [11] [13] [14], especially in our context where the use of modern medicine is often late. By making an early diagnosis and implementing early correct treatment [15], liver abscesses can be benign pathologies with a low mortality rate. The prognosis may be reserved due to late management or the presence of an immunosuppressive comorbidity or an underlying biliary pathology [4] [7] [16].

Updated data on liver abscesses, in this era of antibiotic resistance, progress in interventional radiology, and the challenge of access to quality early care in our context are rare. Hence the conduct of this study, the objective of which was to describe the diagnostic, therapeutic and progressive aspects of liver abscesses at the Sourô Sanou University Hospital Center (CHUSS).

2. Patients and Methods

2.1. Type of Study, Population and Sampling

This was a descriptive cross-sectional study, with retrospective data collection, which took place over the period from January 1, 2018 to December 31, 2021 in the hepatology and gastroenterology department of the CHUSS.

The source population consisted of all patients who stayed in the HGE department during the study period.

Patients who had a liver abscess confirmed by liver ultrasound and hospitalized in the department during the study period were included. On liver ultrasound (LU), was considered as an abscess in the pre-suppurative phase, a hyperechoic lesion with irregular contours, which could mimic a tumor lesion, and in the suppurative phase a hypoechoic and regular lesion, sometimes multilocular and surrounded by a thin capsule. Micro-abscesses were lesions with a discretely hypoechoic nodular appearance.

We did not include primary liver cancers in the form of abscesses, hydatid or superinfected hepatic cysts, as well as unusable patient files.

Sampling consisted of exhaustive consecutive recruitment of patients meeting the inclusion criteria.

2.2. Variables Studied and Data Collection Technique

The data collected concerned:

- Sociodemographic characteristics (age, gender) of the patients.
- Personal history and comorbidities: gallstone disease, intestinal amoebiasis, high blood pressure, diabetes, cirrhosis, human immunodeficiency virus (HIV) infection.
- Habits and lifestyle, particularly alcohol consumption.
- Clinical data: Fontan triad (hepatalgia, hepatomegaly, fever), fever defined by a temperature above 38.6 degrees Celsius, deterioration of the general condition (asthenia, anorexia, weight loss); jaundice, hepatomegaly (characterized by a FH >12 cm on the right midclavicular line and > 9 cm on the xiphoid line), sensitivity in the right hypochondrium, epigastric sensitivity.
- Biological data: blood count, sedimentation rate, C-reactive protein, creatinine, amoebic serology.
- Ultrasound data: topography, size, number and volume of abscess pockets.
- Therapeutic data: analgesics, imidazoles, antibiotics in combination or monotherapy, ultrasound-guided puncture, ultrasound-guided drainage or surgical drainage.
- Probable etiologies: the etiological classification was made on the basis of the bundles of arguments mainly clinical, ultrasound and therapeutic given the insufficiency of diagnostic means and the fact that the costs of exploration and care were at the patient's expense in our work context. The amoebic etiology was retained on the basis of the patient's history (existence of diarrhea of amoebic origin), the ultrasound appearance (in the form of a single, large,

rounded lesion, located in the right liver near the capsule, hypoechoic without associated wall image), the chocolate color of the pus on puncture and a good clinical-biological evolution under treatment with metronidazole. Pyogenic etiology was retained based on the ultrasound appearance (double or multiple lesions, of variable size, hypoechoic without associated wall image), the yellowish or greenish appearance of the liquid on the puncture, the slow or unfavorable evolution under metronidazole only, the good favorable clinical-biological evolution under other antibiotics. An entry point and a history of hepatic colic were also sought.

- Evolution: cure, recurrence, death.

The data were collected from the records of patients hospitalized in the department during the period, and a collection sheet was designed to document the patients' experiences.

2.2. Data Processing and Analysis

The data collected were entered and analyzed using Epi info software version 7.2.0.1.

The description of qualitative variables was done using frequencies and that of quantitative variables using median, minimum, maximum and standard deviation.

Ethical considerations

The research protocol was submitted to the CHUSS institutional ethics committee for approval before the study. Data collection was carried out while respecting the anonymity of patients and the confidentiality of their information. To ensure confidentiality during the study, only the medical file number was reported. No name or information allowing the identification of a patient was mentioned. Clinical and biological data were collected as part of routine care activities.

3. Results

3.1. Sociodemographic Characteristics

At the end of the four years of the study, 1767 patients were hospitalized, including 23 cases of liver abscess, that is an average annual frequency of 5.7 cases. The number of patients included was 23, composed of 17 men, that is a sex ratio of 2.8.

The mean age of the patients was 37.8 years \pm 16.2 years, with extremes of 15 and 73 years. The description of the sociodemographic characteristics of the patients is given in **Table 1**.

3.2. Diagnostic Characteristics of Patients

3.2.1. Clinical Aspects

A pathological background and/or history was found in 21 patients (91.3%), dominated by intestinal amoebiasis and regular alcohol consumption in 13 (56.5%) and 11 (47.8%) patients respectively. No pathological history was found in 8% of patients.

Clinically, the classic Fontan triad (painful hepatomegaly in a feverish context)

Table 1. Sociodemographic characteristics of patients (N = 23).

Variables	Number	Percentages
Gender		
Men	17	73.9
Women	6	26.1
Age groups		
[15 - 25]	6	26.1
]25 - 35]	6	26.1
]35 - 45]	5	21.7
>45 years	6	26.1

was found upon admission in 21 patients (91.3%). A deterioration in general condition was found in more than 50% of patients, associating weight loss, anorexia and asthenia in 69.6%, 65.2% and 56.5% of cases respectively.

3.2.2. Paraclinical Aspects

In biology, a hyperleukocytosis was observed in the blood count of all patients, while an increase in the sedimentation rate and C-reactive protein was observed in 18 patients (78.3%). No patient had a blood culture sample taken. The amoebic serology requested in one patient was positive.

Ultrasound revealed a single or multiple abscess in 9 and 14 patients respectively, located in the majority of cases in the right liver (21 patients, or 91.3% of cases). The estimated mean volume was 718.9 ± 541.9 cubic centimeters.

The diagnostic characteristics are detailed in **Table 2**.

Table 2. Diagnostic characteristics of patients (N = 23).

Variables	Number	Percentages
History and pathological background		
Intestinal amoebosis	13	56.5
Alcohol consumption	11	47.8
Diabetes	4	17.4
HIV Infection	3	13.0
Galstone disease	2	8.7
Clinical signs		
Hepatomegaly	22	95.6
Right hypochondrium pain	21	91.3
Fever	21	91.3
Dysenteric diarrhea	17	73.9
Weight loss	16	69.6
Anorexia	15	65.2

Continued

Asthenia	13	56.5
Nausea-vomiting	13	56.5
Cough	8	34.8
Jaundice	6	26.1
Biological signs		
PNN hyperleukocytosis	23	100
Anemia	10	43.5
Thrombopenia	10	43.5
High C-reactive protein	18	78.3
Location and number of abscesses		
Right liver	21	91.3
Left liver	2	08.7
Single abscess	9	39.1
Multiple abscess	14	60.9
Etiological aspects		
Amoebic abscesses	18	78.3
Pyogenic abscesses	5	21.7

The most representative etiology in our study was amoebic in 78% of cases and the rest were pyogenic liver abscesses (21.7%). Among the five (05) cases of pyogenic liver abscess, three (03) were related to a biliary disease, the other two secondary cases to sepsis with digestive and urinary origin.

3.3. Therapeutic Characteristics

All patients received medical treatment associated or not with instrumental and/or surgical treatment. Metronidazole was used alone (30.4%), or associated with third-generation cephalosporins in 15 patients (65.2%). Level 1 analgesics, including paracetamol at a dosage of one gram every 6 hours, were administered to relieve pain. Ultrasound-guided drainage was performed in 12 (80%) patients and surgical drainage was necessary in 2 patients (8.9%) (**Table 3**).

Table 3. Therapeutic characteristics of patients (N = 23).

Variables	Number	Percentages
Imidazoles and other anti-infectives		
Metronidazole + C3G	15	65.2
Metronidazole only	7	30.4
C3G only	1	04.3

Continued

	Associated treatments	
Analgesics	16	69.6
Hydro-electrolytic intake	16	69.6
Ultrasound-guided drainage	12	52.2
Ultrasound-guided puncture	3	13.0
Surgical drainage	2	08.7
Insulin therapy	4	17.4

3.4. Progressive Aspects

The hospital stay was on average 9.9 days with extremes ranging from 4 to 21 days and a normalization of the temperature in all our patients.

The average quantity of drained pus was 674 cc with a maximum volume of 1280 cc and a minimum of 100 cc.

The evolution was favorable in 19 patients (82.6%), the outcome was fatal in 4 patients including 2 cases of immunosuppression by HIV infection, one diabetic patient and another without reported pathological history. Three patients (12.9% of cases) presented a recurrence.

4. Discussion

This study has some limitations:

- The retrospective nature of the study means that some data are not usable because they are incomplete.
- The inaccessibility of certain paraclinical explorations, in particular blood cultures and amoebic serology, in order to establish the amoebic or pyogenic origin of liver abscesses.
- The small size of our sample does not allow the generalization of our results to the entire population.

Notwithstanding these shortcomings, this study allowed us to obtain results that could serve as a springboard for a more in-depth study. These results will be discussed in this section.

At the end of the thirty-six years of this study, 1767 patients were hospitalized, including 23 cases of liver abscess, representing an average annual frequency of 5.7 cases. This is a relatively rare pathology in our context. This rarity of liver abscess is also reported in the sub-region and in other African countries, with annual frequencies varying according to the study setting [9] [17] and the amoebic or pyogenic etiology ranging from 1 case/year in the studies of Bignoumba and Bouglouga [2] [16] to more than 5 cases/year [4] [5]. This rarity of abscess cases in this study could be explained by a selection of patients who are often treated in peripheral health centers of the city or in other localities, and are only referred to the University Hospital in the event of failure of the initial traditional or modern therapy.

The population was predominantly male, with a sex ratio of 2.8. Several authors agree that men are more affected, both for amoebic and pyogenic abscesses [3] [18] [19], 55 to 60% of cases, according to Rossi *et al.* [6], reaching 70 and 90% in the respective studies of Thioub and Diallo [9] [17]. This male predominance could be explained by the fact that men are more exposed to identified risk factors such as chronic alcoholism and smoking [9] [17]. The average age of the patients was 37.8 years \pm 16.2 years, with extremes of 15 and 73 years. This would be the prerogative of young adults according to several studies in Sub-Saharan Africa [16] [17]. And other authors agree that the frequency would increase with age [6] [7]. Indeed, the older we get, the more certain comorbidities are associated with a progressive decline in immunity, creating a favorable environment for infections.

In terms of diagnosis, a pathological background and/or history was found in 21 patients (91.3%), dominated by intestinal amoebiasis and regular alcohol consumption in 13 (56.5%) and 11 (47.8%) patients respectively. The medical risk factors for the occurrence of liver abscesses reported in the literature include dysentery [17], chronic alcoholism, chronic liver disease, immunosuppression or diabetes, all possible causes of the weakening of the immune system [6] [17] [19]. Thus, Bignoumba *et al.* reported a background of chronic alcoholism (62.5%), diabetes (12.5%) and HIV infection (6.3% of patients) [2]. Clinically, the classic Fontan triad (painful hepatomegaly in a feverish context) was found upon admission in 21 patients (91.3%). Fever was present in all patients with right hypochondrium pain of heaviness type in 21 patients (91.3%). Hepatomegaly was present in 22 patients, or 95.7% of cases.

These data are consistent with findings in other studies in the literature [2] [4] [13]. Badaoui *et al.* reported a Fontan triad in 14 out of 19 cases of pyogenic liver abscess [4]. According to Rossi *et al.*, the typical clinical picture includes fever (73% - 93%), right hypochondrium pain (45% - 80%) and painful hepatomegaly (30-50%) [6]. Bignoumba *et al.* reported right hypochondrium pain (93.8%), fever (68.8%) and hepatomegaly (68.8%) [2]. The deterioration in general condition found in more than 50% of patients could be explained by the late consultation, the inaccessibility of imaging in certain areas and the prior self-medication carried out by patients before consulting. In biology, hyperleukocytosis was observed in the blood count of all patients, while an increase in the sedimentation rate and CRP was observed in 18 patients (78.3%). The amoebic serology requested in one patient was positive. Hyperleukocytosis, anemia, high CRP, significant amoebic serology, positive blood culture and positive cytobacteriological examination of pus are also the findings reported in other African studies [2] [9] [17]. In our context, the costs of examination and treatment are at the expense of patients and their families, which is often a limiting factor for carrying out certain explorations (blood culture, amoebic serology), especially when they are not carried out in the public health structure where the patient is hospitalized.

Ultrasound revealed a single or multiple abscess in 9 and 14 patients respectively. The location was predominantly in the right lobe (21 patients, or 91.3% of

cases) as in the literature. These data are consistent with those in the literature, where the predominance of single abscesses is reported, which are in favor of an amoebic etiology, a frequent parasitosis in the tropics [2] [9] [20]. The most representative etiology in our study was amoebic in 78% of cases. However, it should be taken into account that pyogenic abscesses require more expensive diagnostic means. The predominant location was in the right hepatic lobe (91.3%), in line with most of the reported results [3] [5] [17]. This is probably related to the fact that it constitutes a much larger tissue mass than that of the left lobe, and that the flow from the superior mesenteric vein would flow electively towards the right lobe [21].

Regarding treatment, all patients received medical treatment associated or not with instrumental and/or surgical treatment. The most commonly used drugs were antiparasitics and antibiotics, the main ones being imidazoles alone or associated with a third-generation cephalosporin, in 7 (30.4%) and 15 patients (65.2%) respectively. These data are in line with the results reported in other studies: medical treatment, based on antiparasitics such as metronidazole (100%), associated or not with other antibiotics, is very effective [16] [17] [22]. The majority of abscesses in this study being of amoebic origin, due among other things to the frequency of intestinal amoebiasis in our context, is probably the main cause of favorable response under metronidazole, in monotherapy or dual therapy with another antibiotic. Unlike the study by Bignoumba *et al.*, where 100% of abscesses were drained by ultrasound-guided percutaneous aspiration, supplemented by surgical drainage in 12.5% of cases [2], in our study, ultrasound-guided drainage was performed in 12 (80%) patients and surgical drainage was necessary in only 2 cases (8.9%). Medical treatment is systematic, but not surgery, which is reserved for complications [9] [17]. Indeed, the treatment of hepatic abscesses of less than 3 to 5 cm, especially if they are multiple, can be done by antibiotic therapy without drainage, with a favorable outcome. Ultrasound-guided percutaneous puncture, diagnostic before drainage, and therapeutic, in association with antibiotic therapy, was an effective, less invasive method, with little discomfort for patients.

In terms of evolution, the average hospital stay was 9.9 days with extremes ranging from 4 to 21 days and a normalization of temperature in all our patients. Bouglouga and al. reported an average hospitalization time of 16.2 days [16]. The evolution was favorable, with a cure in 19 patients (82.6%) and a fatal outcome in 4 patients including 2 cases of immunosuppression by HIV infection, one diabetic patient and another with no reported pathological history. Bignoumba and Thioub reported 6.3% and 8% of cases of death respectively [2] [17]. The prognosis is generally good, depending on the diagnostic time, the underlying terrain and the early management [9] [13]. Thus, mortality concerned cases of immunosuppression and association of comorbidities, risk factors for death.

5. Conclusion

This study shows that the clinical picture of liver abscess remains dominated by

the classic Fontan triad. At the paraclinical level, inflammation was almost present in all patients and the abscess was single or multiple. Medical treatment was based primarily on metronidazole alone or associated with C3G, supplemented by instrumental or surgical treatment. The outcome was favorable in the majority of cases. An improvement in etiological diagnosis requires accessibility to amoebic serology, bacteriological examinations and interventional radiology in our context.

Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

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Appendix 1

DATA COLLECTION FORM

I. FILE NUMBER:

II. EPIDEMIOLOGY :

- Age (years):
- Gender: male / / female / /

III. BACKGROUND:

Variables	Present	Absent
Diabetes		
HIV		
Alcohol consumption		
Corticosteroids		
Liver cancer		
cirrhos		
Biliary lithiasis		
Intestinal amoebosis		
No pathological history to report		

IV. CLINICAL DATA

• **Signes fonctionnels:**

Variables	Present	Absent
Pain in the right hypochondrium		
Nausea or vomiting		
Night sweats		
Acute dysenteric diarrhoea		

• **Physical signs:**

- Temperature: °C
- BMI: $\geq 18.5 \text{ Kg/m}^2$ // $< 18.5 \text{ Kg/m}^2$ //
- Right hypochondrium defensiveness: present // absent //
- Hepatomegaly: present // absent //
- Jaundice: present // absent //

• **General signs:**

- Fever: present//absent//
- Asthenia: present // absent //
- Anorexia: present // absent //
- Weight loss: present // absent //
- Night sweats: present // absent //
- Feeling of malaise: present // absent //

V. PARACLINICAL DATA

- **BIOLOGY:**

- **Inflammatory work-up:** blood count, C-reactive protein (CRP) and sedimentation rate (ESR)

Variables	Elevated	Decreased	Normal
Blood count			
White blood cell count			
Haemoglobin level			
Platelet count			
CRP			
ESR			

- **Blood culture results**

Positive
Negative
Not carried out

- **Amebic serology results**

Positive
Negative
Not carried out

- **Liver ultrasound**

- Location of abscess: right liver // left liver //
- Number of abscesses :
 - Single //
 - Two abscesses //
 - ≥ 3 abscesses
- Size of abscess (cm):

VI. ETIOLOGIES

- **Presumed mechanism of liver damage**

- Biliary tract disease: present // absent //
- Vascular disease: present // absent //
- Post-amoebosis intestinal abscess: present // absent //

- **Presumed germs involved**

- **Amoeba:** present / / absent / /
- **Bacteria:** present / / absent / /

VII. TREATMENT

- **Medical:**

- Resuscitation measures: yes // no //
- Type of antibiotic therapy:
 - Metronidazole alone: Yes // NO //
 - 3rd generation cephalosporins (C3G): Yes // NO //
 - Combination: metronidazole + C3G: Yes // NO //
 - or combination of metronidazole + other families of antibiotics:
Yes // NO //

- **Puncture/Drainage:** Yes // NO //

If Yes:

- Guided echo puncture: Yes // NO //
- Scan-guided puncture: Yes // NO //
- Guided echo drainage: Yes // NO //

- **Surgical:** Yes // NO //

If Yes:

- First intention: Yes // NO //
- After puncture: Yes // NO //
- After drainage: Yes // NO //

- If puncture or drainage, specify the appearance of the pus evacuated: Chocolate-coloured pus // Yellowish or greenish // Frank pus //

I. EVOLUTION:

- **Length of hospital stay (days):**

- **If drainage, specify:**

- Total volume drained (CC).....
- Duration (days):

- **Complications:** Yes / / NO / /;

if Yes, specify the type.....

- **Death:** Yes / / NO / /

- **Recurrence of abscess:** yes / / NO / /