Research Article ISSN 2835-3587

Radiology & Imaging Journal

Contribution of Echography in Hepato-Biliary Pathologies to the Radiology and Medical Imaging Department of the Point G Chu

TRAORE Ousmane[1,2*], KONATE Moussa[1], DIAKITE Siaka[1], CISSE Yaya[1], GUINDO Ilias[2], CISSE Issa[2], Niaré Bernard[1], SIDIBE Drissa Mansa[2], Diallo Mahamadou[2], SIDIBE Siaka[2] and KEITA Adama Diaman[1,2]

[1]*Radiology Department of the University Hospital Center (CHU) of point "G" Bamako-Mali.*

[2]*Research lecturer, Faculty of Medicine and Odontostomatology (FMOS) of the University of Science, Techniques and Technology of Bamako (USTTB)-Mali.*

***Correspondence:**
TRAORE Ousmane, Lecturer in radiology and medical imaging FMOS/USTTB –Mali, Tel: 00223 76465335.

Received: 12 Jan 2025; **Accepted:** 19 Feb 2025; **Published:** 06 March 2025

Citation: TRAORE Ousmane, KONATE Moussa, DIAKITE Siaka, et al. Contribution of Echography in Hepato-Biliary Pathologies to the Radiology and Medical Imaging Department of the Point G Chu. Radiol Imaging J. 2025; 4(1); 1-5.

ABSTRACT

Introduction: *In the field of imaging, ultrasound plays an essential role in the diagnosis and management of hepatobiliary diseases. The aim of our work was to study the ultrasound aspects of hepatobiliary pathologies in the radiology and medical imaging department of the Point G University Hospital.*

Methodology: *This was a descriptive retrospective study from January 1, 2019 to December 31, 2023 in the radiology and medical imaging department of Point G. It concerned all patients with one or more hepatobiliary pathologies seen on ultrasound regardless of age and gender. The parameters studied were sociodemographic data and the ultrasound aspects of hepatobiliary pathologies. Informed consent was obtained from all our patients.*

Results: *During the study period, the total number of patients who underwent liver and gallbladder ultrasound was 14,292 patients, of whom 380 met our inclusion criteria, or 2.6% of cases. The mean age of the patients was 34.71 ± 25.27 years with extremes of 15 and 97 years. There was a female predominance (51.8% of cases) with a sex ratio of 0.92. The nephrology department was the main department requesting the ultrasound examination with 27.9% of cases. Pain in the right hypochondrium was the main reason for requesting the examination with 22.7% of cases. The location of the lesions was hepatic with 81.5% of cases. Segment VI was the most affected with 13.7% of cases. Some segments had multiple lesions, however all hepatic segments were affected. Hepatic steatosis was the most represented pathology with 88 patients or 21.2% of cases.*

Conclusion*: Ultrasound is the first-line examination in the diagnosis of hepatobiliary pathologies. It has made it possible to diagnose many hepatobiliary pathologies.*

Keywords

Ultrasound, Hepatobiliary pathologies, Imaging, CHU point G.

Introduction

The liver and biliary tract play a central role in many vital functions of our body. They are exposed to various pathological conditions that can alter its structure and function [1]. Hepatobiliary pathologies, including viral hepatitis, cirrhosis and liver cancer, are believed to represent a considerable public health burden. The prevalence varies considerably from one country to another, but viral hepatitis is a recurring problem in many African regions [2]. According to the World Health Organization (WHO), 10% of the world population is infected with amoebic liver abscess, i.e. 500 million people [3] and gallstone disease globally affects 25% of the population over 50 years of age [4]. In Mali over a period of 15 years (from 1979 to 1995), 74 cases of gallstones were recorded in the surgical department "B" of the National Hospital of Point G [4]. Ultrasound is a medical imaging method that occupies a prominent place in the exploration of hepatobiliary pathologies [5]. It is a non-invasive and widely available imaging method, offering a valuable window on the morphology and health of the liver and biliary tract [6,7]. It allows to observe in real time the internal structures of the organ and to detect anomalies that could indicate a range of pathologies [5]. From the evaluation of hepatitis to the diagnosis of gallstones, including the early detection of tumors and liver infections, ultrasound plays an essential role in

the management of hepatobiliary diseases [7]. The objective of our work was to study the ultrasound aspects of hepatobiliary pathologies in the radiology and medical imaging department of the Point "G" University Hospital Center (CHU).

Methodology

This was a descriptive retrospective study with data collection from January 2019 to December 2023, a period of 05 years in the radiology and medical imaging department of the Point G University Hospital. It included hospitalized or non-hospitalized patients of all ages, of both sexes who had undergone a hepatobiliary ultrasound with one or more hepatobiliary pathologies. A SIEMENS healthineers ultrasound scanner and the ACUSON NX3 Elite with 3 to 12 MHz probes were used. Data collection was done from the ultrasound registers and ultrasound reports of the radiology and imaging department of the Point G University Hospital. Analysis and processing were done on SPSS 27 software. Informed consent was obtained from all our patients.

Results

The overall frequency was 2% of cases in our study, i.e. 380 patients out of 14,292 patients who underwent ultrasound during the study period.

Sociodemographic Data

The 46-60 age group was the most represented, i.e. 32.6% of cases. The average age was 34.71 years with extremes ranging from 15 to 97 years (Table 1).

Table 1: Distribution of patients by age group.

Age group	Numbers	Percentage
0-15 years	5	1,3
16-30 years	49	12,9
31-45 years	80	21,1
46-60 years	**124**	**32,6**
+60 years	84	22,1
Not mentioned	38	10,0
Total	**380**	**100,0**

The female sex was the most represented in 51.8% of cases against 48.2% of male cases, i.e. a sex ratio of 0.93. The frequency of hepatobiliary pathologies declined in 2020 and 2021. On the other hand, the greatest number of cases was recorded in 2022 with 131 cases, i.e. (32.6%) of cases (Figure 1).

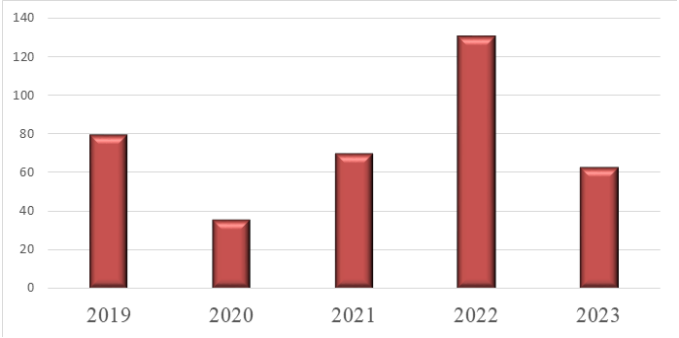

Figure 1: Distribution of patients according to the year in which the ultrasound examinations were performed.

The nephrology department was the most frequent source with 27.9% of cases followed by the surgery department in 18.9% of cases, the infectious diseases department in 18.7% of cases, internal medicine in 16.6% of cases and the emergency department in 12.1% of cases. Abdominopelvic ultrasound was the most requested examination with a frequency of 87.9% of cases followed by abdominal ultrasound in 11.8% of cases and one case of renal ultrasound or 0.3% of cases. Pain in the right hypochondrium and abdominal pain were the most frequent clinical information with a cumulative frequency of 43.7% of cases (Table 2).

Table 2: Distribution of patients according to clinical information.

Clinical information	Numbers	Percentage
Right hypochondrium pain	**106**	**22,7**
Pelvic pain	1	0,2
Ascites	2	0,4
Jaundice	36	7,7
Abdominal pain	**99**	**21,2**
Abdominal distension	56	12,0
Hepatomegaly	38	8,2
Liver function tests	70	15,0
Renal function tests	46	9,9
Other clinical information	12	2,6
Total :	**380**	**100**

Ultrasound Data

Liver lesions were the most common in our series with 81.5% of cases versus 18.5% of biliary lesions. All liver segments were affected with multiple lesions in some segments. Segment IV was the most affected in 13.1% of cases followed by segment VI in 13% of cases, segment VII in 12.6% of cases, segment VIII in 12.5% of cases, segments II, III and V in 12.4% of cases each and segment I in 11.9% of cases. Hepatic steatosis was the most represented pathology with 88 patients or 21.2% of cases in our study (Table 3) (Figure 2).

Table 3: Distribution of patients according to ultrasound diagnosis.

Ultrasound diagnosis	Numbers	Percentage
Hepatic angioma	7	1,7
Hepatic cardiac	72	17,3
Hepatic abscess	49	11,8
Alithiatic cholecystitis	20	5
Lithiatic cholecystitis	50	12
Hepatic cyst	16	3,8
HCC	14	3,7
Metastatic tumors	8	2,1
Homogeneous hepatomegaly	64	15,4
Cirrhosis	43	11, 3
Hepatic steatosis	**88**	**21,2**
Total	**380**	**100,0**

Liver abscess being the most frequent liver infection in our series had a volume greater than 200 milliliters (ml) in 22 of our patients, i.e. a cumulative 44.8% of cases (Figure 3). In our series, hepatocellular carcinoma (HCC) being the most frequent

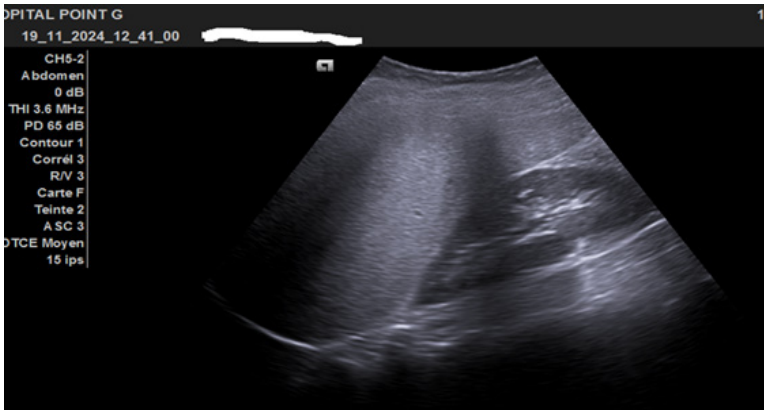

Figure 2: Longitudinal pair B-mode ultrasound showing the liver increased in size, with regular contours, shine, and a homogeneous hyperechoic echostructure compared to the renal cortical area: appearance of hepatic steatosis.

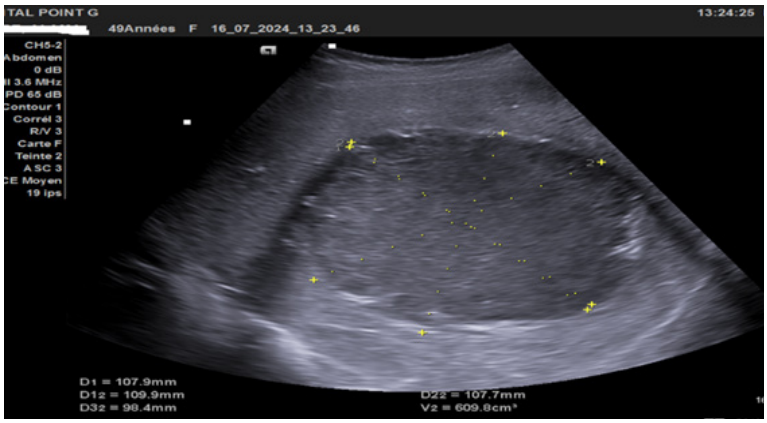

Figure 3: B-mode ultrasound in longitudinal section showing the liver increased in size, regular contours, heterogeneous echostructure by the presence of a well-circumscribed image of irregular contours, cloudy liquid content in quicksand of 107x107x109mm or a volume of 609ml at the expense of the right lobe: Hepatic abscess.

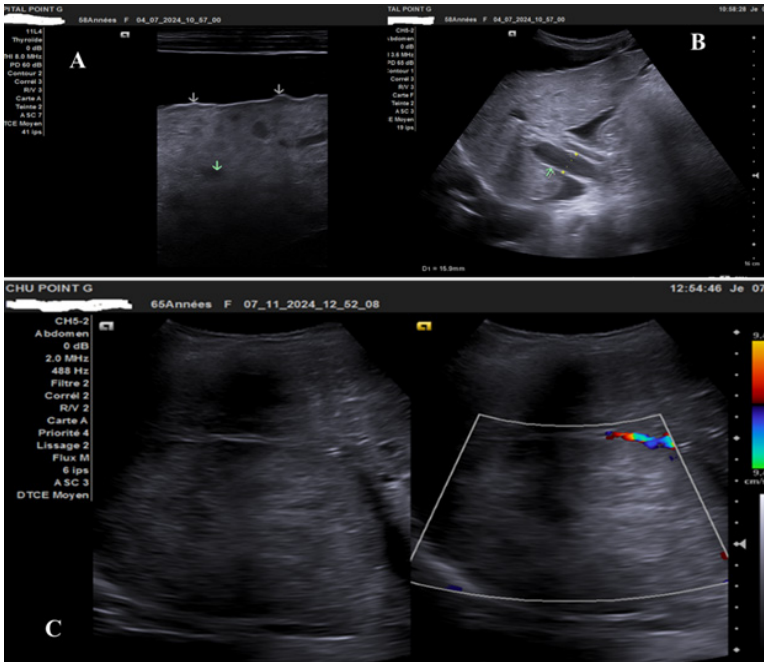

Figure 4 (A, B and C): B-mode ultrasound in longitudinal section passing through the hepatic hilum reveals a dysmorphic liver with heterogeneous echostructure with nodules of variable sizes, with irregular contours (A) associated with a dilation of the portal vein (B) associated with a heterogeneous tissue mass, well-defined, with irregular contours measuring 43x36 mm and a large amount of ascites (A and C): appearance of chronic liver disease of the cirrhosis type with HCC.

tumor in 14 patients was seen on ultrasound as a heterogeneous liver with irregular contours in all cases and the portal trunk was dilated in 88% of cases. This HCC developed on hepatic cirrhosis in 100% of cases (Figure 4). Stone cholecystitis represented the majority of biliary pathologies in which ultrasound had objectified the gallbladder wall greater than 03 mm in 100% of cases and the ultrasound Murphy sign in 91% of cases of cholecystitis (Figure 5).

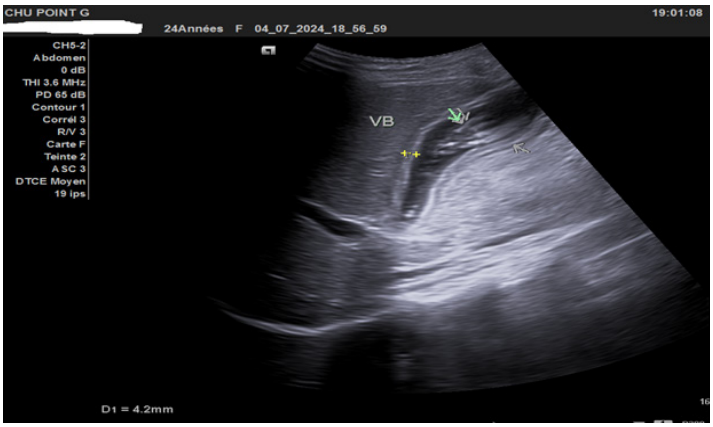

Figure 5: B-mode ultrasound in recurrent section objectifying the gallbladder with echogenic content and thickened wall measuring 4.2 mm in maximum thickness associated with pain when passing the probe into the gallbladder area (ultrasound Murphy sign): acalculous cholecystitis.

Discussion

Socio-epidemiological Data

We had collected 380 cases of hepatobiliary pathologies, i.e. an overall frequency of 2.65% of cases compared to the 14,292 patients seen during the study period. This result was lower than that of Agoda et al., who had found 11.5% frequency in one year [1]. This could be explained by the fact that our study extended over 05 years and concerned all ages. In our study, the 46-60 age group was the most represented, i.e. 32.6% of cases. The average age was: 34.71 years. This result was superimposable to that of Agoda et al., in Benin in 2006 who had found an average age of 42 years with an age group of 40 to 50 years in 31.88% of cases [1]. There was a female predominance with a sex ratio of 0.92 in our study. This was consistent with a study done in Benin in 2006 which found 0.66 [1]. The large number of women seen in consultation would explain this percentage. The frequency of hepatobiliary pathologies had declined in 2020 and 2021, this could be due to the health restrictions due to the COVID-19 virus which had occurred in 2020 in Mali. Pain in the right hypochondrium and abdominal pain were the most frequent clinical information with a cumulative frequency of 43.7% of cases. This was due to the anatomical situation of the liver and gallbladder located in the right hypochondrium. This result was consistent with that of Agoda et al., done in Benin in 2006 who had found 42% of cases [1]. Nephrology and infectious disease were the most represented services. Therefore we can say that this result was due to the absence of a permanent gastro-hepato-enterology service at the CHU point G.

Ultrasound Data

Hepatic steatosis represented 21% and homogeneous hepatomegaly without focal lesion represented 15.4% of cases in our study, this result was similar to that of a study carried out in Benin by Agoda et al. who found 25.84% for hepatic steatosis and 32.6% of cases of homogeneous hepatomegaly in 2006 [1] and also by N'Dakena et al. in Togo [8]. This demonstrated that chronic liver diseases are the most numerous among liver diseases in developing countries. The echostructure of the liver was homogeneous in 65.5% of cases. This result was higher than that of a study carried out in Benin which found 41% of cases [1]. This could be explained by the high frequency of steatosis and homogeneous hepatomegaly in our study. For HCC, the liver was heterogeneous in 100% of cases. HCC tends to destroy the liver parenchyma often irreversibly [9]. For liver abscess, the volume of abscesses was greater than 200 ml in 34% of our patients. The mean volume was 512 ml with extremes of 20 and 1300 ml. Large abscesses could be explained by delayed diagnosis. A uniform distribution of liver disease in all segments of the liver may indicate diffuse rather than localized liver disease. This could be explained by the presence of pathology such as hepatic cirrhosis, hepatic steatosis, which tended to affect the entire liver uniformly. Previous studies have also reported a uniform distribution of liver lesions in different liver diseases. In the literature it was found that the lesions were uniformly distributed in all segments of the liver, which reflected the diffuse nature of cirrhotic disease [10,11]. In this study, in 100% of cases of cholecystitis, whether alithiatic or lithiatic, there was thickening of the gallbladder wall. This result was consistent with the medical literature, which described thickening of the gallbladder wall as one of the most reliable and frequent ultrasound signs of cholecystitis. It was generally defined as an increase in the thickness of the gallbladder wall to more than 3 mm on abdominal ultrasound [1]. In this study, the ultrasound Murphy sign was positive in 90% of cases of cholecystitis, suggesting a strong correlation between this sign and the presence of the disease, which was consistent with that of the literature [12,13]. Hepatic steatosis, liver abscesses, hepatomegaly, and gallstones were the most frequently diagnosed in our study.

Conclusion

Ultrasound is a non-invasive and widely accessible medical imaging method in the diagnostic management of hepatobiliary diseases. It has allowed to suggest the diagnosis of hepatobiliary pathologies such as lesions of infectious, inflammatory, tumoral origin and chronic liver diseases. This imaging technique remains first-line in hepatobiliary diseases and is particularly valuable in resource-limited contexts where other more expensive or less available imaging modalities, such as computed tomography (CT) or magnetic resonance imaging (MRI), are not always accessible.

References

1. Agoda-koussema LK, Anoukoum T, Adjenou K, et al. Contribution of abdominal ultrasound in adult hepatobiliary pathology. About 138 cases. J Sci Res Univers Lomé. 2010; 12: P 251-253.
2. Stanaway JD, Flaxman AD, Naghavi M, et al. The global

burden of viral hepatitis from 1990 to 2013: findings from the Global Burden of Disease Study 2013. Lancet. 2016; 388: 1081-1088.

3. Aucott JN, Ravdin JI. Amebiasis and nonpathogenic intestinal protozoa. Infect dis. 1993; 7: 467-485.
4. Ba HB. Biliary lithiasis in the surgical department B at the national hospital of point G: from 1979 to 1994 123p. University of Bamako; 1997. clinics of North America. 1993; 7: 467-486.
5. Ladam-Marcus V, Mac G, Job L, et al. Performance of contrast-enhanced ultrasound in liver pathology: review of the literature: Contrast-enhanced Ultrasound and liver imaging: review of the literature. J Radiol. 2009; 90: 93-106.
6. Coulibaly SO. Contribution of ultrasound in patients referred for non-traumatic abdominopelvic emergencies in adults medical thesis 19M329 86 P Thesis. University of Science, Techniques and Technologies of Bamako. 2019.
7. Portalez D. Contrast-enhanced ultrasound of liver tumors. EMC-Radiol. 2004; 1: 196-215.
8. N Dakena K A. Activity report of the ultrasound unit at the CHU-TOKIN in LOME. EAM-UI thesis. 2004; 151-155.
9. Schuppan D, Afdhal N. H. Liver cirrhosis. Lancet. 2008; 371: 838-851.
10. Desmet VJ, Roskams T. Cirrhosis reversal: a duel between dogma and myth. J Hepatol. 2004; 40: 860-867.
11. Kanté S. Ultrasound appearance of CHC in the radiology and nuclear medicine department of the Point G University Hospital THESE med. 2013; 5: 65.
12. Boukinda F, Chakirou L, Wang PJ, et al. Acute non-lithiatic cholecystitis. About 3 observations. Black African Medicine. 1993; 3.
13. Zins M, Boulay-Coletta I, Molinié V, et al. Imaging of gallbladder wall thickening. J Radiol. 2006; 87: 479-492.