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CT Study of Liver Pathologies: About a Review of the Literature and Frequency at the Rock Medical Imaging Center (CIMR) in Kinshasa

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Abstract

Context and objective: The prevalence of liver pathologies has been increasing since the advent of more sophisticated medical imaging methods. Our objective was to describe the CT aspects of liver pathologies observed at CIMR. **Methods:** This was a descriptive observational study of a retrospective series of 304 cases received at the ROCHER Medical Imaging Center (CIMR) in Kinshasa over a period of 24 months, going from January 2020 to January 2022. The parameters of the interests were sociodemographic, clinical and CT. **Results:** The incidence of liver disease in this population was therefore 12.8%. The average age was 55.42 ± 16.6 years with the range from 35 to 71 years with a F/M sex ratio of 1.3. The characterization of a mass and the exploration of cholestasis represented the most frequent indications. Solid lesions classified as LI-RADS 5 were found the most (26.1%) and LI-RADS 4 (18%). Biliary cysts were the fluid masses most frequently found in (42.9%) followed by abscesses (37.1%). Female subjects were in the majority in solid (54%) and fluid (65.7%) masses with a statistically significant difference compared to male subjects ($p = 0.001$). Furthermore, the average age of patients with solid masses (57.2 ± 9.9 years) was statistically higher ($p = 0.031$) compared to the average age of patients with fluid masses (49.7 ± 9.8 years). Bile duct dilatations were accompanied by detectable masses in 88.2%. The same observation was made in the dilatations of VBIH and normal VBP (n = 35) which were accompanied by tumor lesion in 88.6%. Out of a total of 146 cases of diffuse pathologies observed, cirrhosis was found in 85% compared to 15% of cases for fatty liver. **Conclusion:** CT makes it possible to highlight liver pathologies in a certain frequency. Solid lesions classified LI-RADS 5 and LI-RADS 4 are the most common (18%). While biliary cysts and abscesses are the most commonly found fluid masses.

Keywords

CT, Liver Pathologies, Solid Masses, Fluid Masses

1. Introduction

The prevalence of liver pathologies has been increasing since the advent of more sophisticated medical imaging methods (Valls, 2006). There are numerous liver diseases, some of which, such as viral and alcoholic hepatitis, constitute a public health problem (Duan et al., 2017). Furthermore, liver cancer, often diagnosed late, represents the 5^{th} most common cancer in the world.

Globally, they affect more than 1.5 billion people: chronic infections by hepatitis viruses remain a scourge with 58 million people infected by the hepatitis C virus (HCV) and 300 million by the hepatitis C virus. hepatitis B (HBV); 10% of the population is at risk of alcohol-related liver disease due to excessive alcohol consumption; due to the continued increase in obesity and metabolic syndrome, 25% of the population has nonalcoholic fatty liver disease (NAFLD) (Dhaliwal et al., 2021). In sub-Saharan Africa where diagnostic means for liver pathologies are limited, particularly for the diagnosis of hepatocellular carcinoma (HCC). According to Globocan 2012, liver cancer has an incidence of 22.6/100,000 inhabitants in men and 10.4/100,000 inhabitants in women with a mortality of 21.4/100,000 inhabitants and 10.2/100 000 inhabitants respectively.

Hepatocellular carcinoma is the most common primary liver cancer and occurs most often in patients with cirrhosis (Dhaliwal et al., 2021). To diagnose it, biopsy has long been the gold standard test. However, this invasive examination presents risks, which justifies the interest in non-invasive imaging methods (Bossali et al., 2011). Liver imaging today is made up of methods that did not exist 40 years ago, while those of the time have almost entirely disappeared. The development of ultrasound, computed tomography (CT), magnetic resonance imaging (MRI), and positron emission tomography (PET) has been rapid technologically, sometimes preceding and guiding the strategy medical (Choi et al., 2013).

The objective of this study was to review the literature concerning the place of CT-scan in the diagnosis of liver pathologies, but also to describe the CT aspects of liver pathologies observed at the CIMR. By highlighting the epidemiological characteristics of liver pathology, identifying the main indications for CT for liver pathologies and identifying the main liver pathologies and their CT aspects.

__Liver cirrhosis:__ Liver fibrosis, the ultimate expression of which is cirrhosis, is the consequence of all chronic liver diseases (Park et al., 2012). The definition of cirrhosis is histological: it is the transformation of normal hepatic architecture by a diffuse process, characterized by concentric fibrosis delimiting regeneration nodules (Rinella et al., 2023).

In imaging, the diagnosis of cirrhosis is based on three main types of signs: analysis of the liver parenchyma (with the visualization of fibrous tissue and regeneration nodules), hepatic dysmorphia and signs of portal hypertension. To these three large groups of signs will be added functional signs, reflecting the hemodynamic changes induced by cirrhosis as well as some abnormalities frequently associated with cirrhosis (Joo et al. 2015).

On CT, changes in the structure of the liver parenchyma are less visible. A certain heterogeneity can be detected, but only in the event of significant fibrous changes. Large bands of fibrosis are suspected, in the form of hypodensities, which will be enhanced very late after injection of iodinated contrast product. In this case, the bands of fibrosis are readily retractable and they make it possible to define macronodules enclosed in their mesh. When a certain degree of steatosis is associated with cirrhosis, the heterogeneity of the parenchyma appears much more marked on CT (Guyatt et al., 2008). Macronodules (>3 mm), which are most often encountered in cirrhosis of viral origin. They are most often isodense on CT and are not hypervascularized.

During cirrhosis, the hepatic contours become irregular, then frankly bumpy. When cirrhosis is not very advanced, the liver is often hypertrophied, due to inflammatory and edematous phenomena. Secondarily, the evolution is towards a parenchymal rarefaction, a rarefaction which is unevenly distributed. Atrophy predominates in segment IV and the right posterior segments. At the same time, the segments of the left lobe and especially segment I hypertrophy (Rinella et al., 2023). The hemodynamic changes of portal hypertension will have a morphological expression on imaging: increase in the caliber of the portal vein and the splenic vein, splenomegaly and appearance of portosystemic diversion pathways (Joo et al. 2015). Regenerative nodules are generally not detected on CT. They appear perfectly isodense, whatever the vascular times. The heterogeneous appearance of the parenchyma is most often due to vascular disorders associated with cirrhosis. The nodules can be individualized if the fibrosis is significant enough to, enhancing late, silhouette the nodules. This is most often the case in macronodular cirrhosis (Guyatt et al., 2008).

Likewise, dysplastic nodules are difficult to discern and especially to characterize on CT. They are most often iso- or hypodense in spontaneous contrast. There is generally no hypervascularization in the arterial phase. In the portal and late stages, they are predominantly hypodense. However, in a small number of cases, they can be hyperdense. Siderotic nodules may appear spontaneously hyperdense on CT. Hepatocellular carcinoma most often appears nodular, associated with satellite nodules. There are more or less diffuse multinodular forms and much rarer infiltrative forms (Guyatt et al., 2008).

Hepatocellular carcinoma less than 3 cm in diameter often appears hypodense, well limited, enhanced in the arterial phase with washout in the portal and late phases. For larger lesions, the appearance is often more heterogeneous, with areas of little vascularity or necrosis. The capsule and septa may become elevated later in life. The sensitivity of CT for detecting hepatocellular carcinoma varies between studies. It can be between 88 and 94% in the best series, but when explanted livers are used as a reference, in the case of severe cirrhosis, the sensitivity varies from 37% to 71% depending on the series.

Benign liver tumors: Hepatic angioma or hemangioma is one of the most common benign lesions. Its prevalence in the general population ranges from 1.2 to 20%. Hepatic angioma is observed at all ages and is most often asymptomatic. The rare symptomatic subjects have large angiomas which cause symptoms by complication or by compression of adjacent structures. An angioma is a lesion that does not degenerate, which is why diagnosis by imaging is fundamental. In CT, there are three fundamental signs for the diagnosis of hepatic angioma: marked hypodensity before injection of contrast product; contrast measurement peripheral in the form of puddles followed by centripetal filling, the persistence of the enhancement in the late period (Alhyari et al., 2022).

Cystic liver lesions: Simple liver cysts are serous fluid formations that do not communicate with the bile ducts. The term biliary cyst used in French is incorrect because the cyst does not contain bile and should be replaced by the name simple cyst or hepatic cyst (term used by the Anglo-Saxons). Very common in the general population, most simple cysts measure less than 3 cm in diameter and are easily detected and diagnosed by ultrasound. The rare symptoms most often correspond to intracystic bleeding which changes the appearance of the cyst, mimicking a cystic tumor or a hydatid cyst. The simple cyst is a common anomaly most often revealed by imaging. The prevalence in ultrasound is between 3 and 5 p. 100 and reached 18 p. 100 in a CT study in the adult population. These differences are probably related to the small size of the cystic lesions. The incidence of simple cysts depends on age and sex. They are rare before the age of 40 and the incidence increases afterward. On CT, the simple cyst is homogeneous and hypodense without injection, without enhancement of the wall or contents after intravenous administration of contrast product (Alhyari et al., 2022).

Biliary hamartomas: *Biliary* hamartomas are also called von Meyenburg complexes and are part of ductal plate abnormalities. Biliary hamartomas have long been known to surgeons and pathologists because they are often discovered incidentally during liver surgery. The recognition of these lesions by imaging is more recent (Zhang et al., 2016). Imaging of biliary hamartomas is variable and depends on the number and size of the lesions. These are generally multiple, well-circumscribed lesions, usually between 2 and 10 mm in diameter. On CT, the lesions are hypodense before injection and they generally do not enhance after injection of contrast material (Hyodo et al., 2013). On CT, the proximity of the peribiliary cysts and the bile ducts is clearly demonstrated. Peribiliary cysts are hypodense before and after contrast injection and are therefore better visible after injection.

Cystic tumors: Biliary cystadenomas are tumors 100 to 1000 times rarer than simple liver cysts. Their prevalence is between 1 in 10,000 and 1 in 100,000. These tumors affect 8 times out of 10 women whose age is almost always over 40 years old. It is important to diagnose them and differentiate them from complicated biliary cysts, particularly hemorrhagic ones. On CT, biliary cystadenoma appears as a single cystic mass with clearly visible, often thick walls. Partitions are common, but sometimes less obvious than on ultrasound; Exceptionally, wall nodules and calcifications are observed. In multilocular forms, there may be differences in density from one compartment to another (Alhyari et al., 2022).

Cystic metastases: Liver metastases are solid tumors and the cystic form is rare. The cystic component may be partial or complete. Cystic metastases are often metastases from endocrine tumors, sarcomas, melanomas, and certain types of lung cancer and breast cancer (32). They are also seen in mucinous adenocarcinoma or cystadenocarcinoma, particularly secondary to ovarian and pancreatic cancer. Finally, although rare, liver metastases from anal cancer are very frequently cystic (Alhyari et al., 2022).

Hepatocarcinoma: Most hepatocarcinomas develop as multistep processes in the context of chronic liver disease. Foci of dysplastic cells, low-grade dysplastic nodules, and high-grade dysplastic nodules have been identified as preneoplastic lesions (Tang et al., 2015). A minority of hepatocarcinomas occurs in children or adults in the absence of liver disease. This shows the importance of genetic predispositions in the occurrence of hepatocarcinoma (Joo et al., 2015). On CT, tumoral arterial hypervascularization is a key sign for the detection and characterization of hepatocarcinoma. This sign can be demonstrated on CT or MRI, showing a transient enhancement of the tumor signal during the late arterial phase (arteriocapillary phase) after injection of a bolus contrast agent (Park et al., 2012).

Intrahepatic cholangiocarcinoma: it is an adenocarcinoma originating in the bile ducts. Intrahepatic or peripheral cholangiocarcinomas are often distinguished from cholangiocarcinomas of the hilum and common bile duct (Kang et al., 2012). On CT, the tumor is hypodense and hypovascularized. A progressive enhancement of the intratumoral fibrous areas can be observed in the late phase after injection of a contrast agent. The importance of intratumoral fibrosis is also reflected by the presence of areas of hepatic capsular retraction adjacent to the tumor (Park et al., 2012).

Pyogenic abscess: The abscess is located in the right liver in the majority of cases. The presentation is variable and depends on the progressive stage of the infection. It may be either multiple micro-abscesses disseminated in the liver parenchyma or grouped more or less coalescent, or a single lesion of larger diameter, presenting a cavity with a more or less regular contour with the possible presence of septa. The essential characteristic of these lesions is their evolving nature over time, with transformation towards a single collection from initial microlesions. CT has a sensitivity of around 95% which is better than that of ultrasound. The abscess is hypodense before injection. After injection, we find peripheral contrast enhancement in the ring in 80% of cases, without contrast enhancement in the center of the lesion. This contrast enhancement is not specific and can be seen in a tumor context. The presence of air in the center of the lesion or, after injection, of a double crown of the peripheral shell with a hypodense crown (Casellas et al., 2017).

2. Materials and Methods

2.1. Study Setting, Type and Period Study

This was a descriptive observational study of a retrospective series of cases received at the ROCHER Medical Imaging Center (CIMR) in Kinshasa over a period of 4 years, going from January 2018 to January 2022.

2.1.1. Study Population

The population of this study consisted of 1185 adult patients of both sexes who had an abdominal or thoraco-abdominopelvic CT scan, including those with the presence of a hepatic anomaly during the study period were included in our investigation.

2.1.2. Patient Selection Criteria

Inclusion criteria: Patients in whom a liver abnormality was found on an abdominal CT scan. **Exclusion criteria: Patient with** incomplete file. Patients with abdominal CT indicated for something else and who did not show a liver anomaly (incidentally).

2.1.3. Sample Size

This was a non-probability and exhaustive convenience sample. Our sample size was n = 304 reports.

2.2. Study Parameters and Operational Definitions

2.2.1. Variables of Interest

The collection concerned the following data: General data: age and sex, Indications: incidental discovery, characterization of a mass seen on ultrasound, search for metastasis, search for complications of cirrhosis, exploration of cholestasis, post-traumatic assessment.

2.2.2. Definitions Operational

Metastasis: hypovascularized metastasis with peripheral and continuous enhancement; hypervascular metastasis clearly visible in the arterial phase and washing in the arterial and late phase.

Cholangiocarcinoma: *hypodense and* hypovascularized lesion with progressive enhancement in the late phase and presence of a zone of capsular retraction.

Lymphoma: several very hypovascularized, necrotic hepatic masses and the enhancement is weak and marginal associated with spenomegaly and lymphadenopathy (Figure 1).

The major diagnostic criteria:

1) Hypervascularization in the arterial phase corresponding to an enhancement in the arterial phase, non-peripheral, unequivocal, in part or in whole of the observation and whose intensity or density is greater than that of the hepatic parenchyma. 2) Washout corresponding to the non-peripheral visual reduction and over time (during the early to later phases) of the enhancement of a portion or the entirety of the observation compared to the adjacent parenchyma. The observation appears hypovascular in the portal venous or late phase. 3) Capsule enhancement: corresponds to an enhancement with a smooth, uniform and well-defined outline, of the majority or the entirety of the observation. Auxiliary criteria in favor of non-specific malignancy: distinct nodule without contrast, peri-lesional enhancement in the late arterial phase or in the early portal phase, steatotic sparing within a solid mass. Auxiliary criteria in favor of CHC: Non-enhanced capsule: non-enhanced, smooth and regular delimitation.

Figure 2 shows the appearance of nodule within a nodule: presence of smaller internal nodules in the main nodule. Mosaic appearance: presence of nodules or internal compartments distributed randomly.

The diagnosis of HCC is based, initially, on the combination of major signs including: Enhancement in the arterial phase; the size of the lesion; the presence

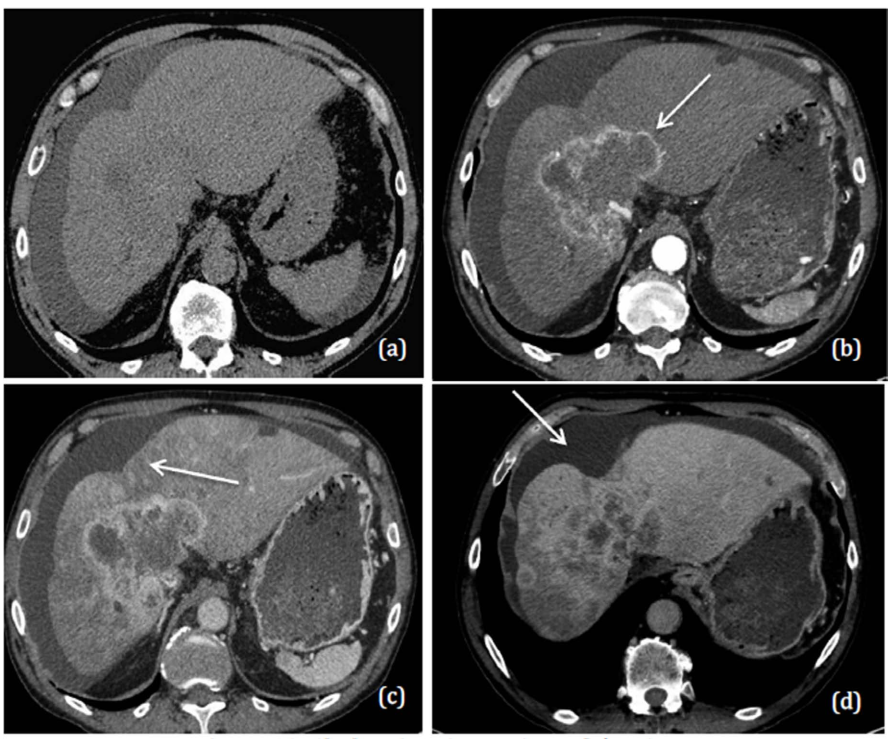

Figure 1. Intrahepatic cholangiocacinoma.

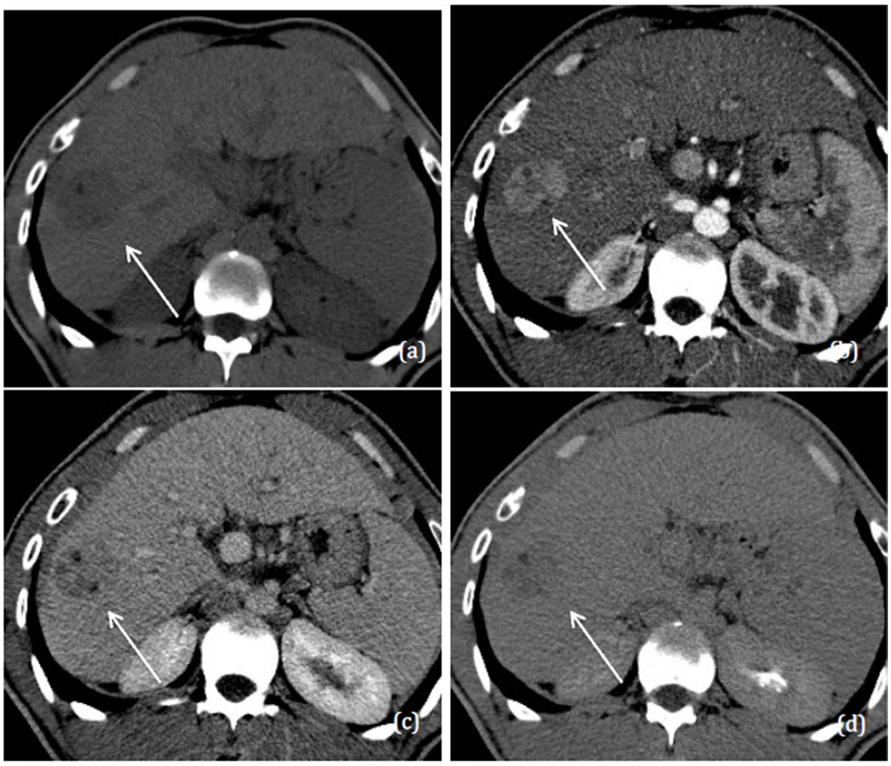

Figure 2. Peripheral capsule (without injection and after injection of product).

of an appearance of washing in the venous and/or late stages, the presence of a peripheral capsule, secondly, auxiliary signs can be applied in order to upclassify or underclassify a lesion compared to its initial classification. Conversely, the ancillary signs described as favoring benignity are: isosignal in the hepatobiliary phase, frans hypersignal on T2 weighting, marked and homogeneous hyposignal on T2 or T2* weighting, visualization of vessels crossing the lesion without distortion, the parallelism of the enhancement of the lesion with that of the vascular structures, and the reduction or stability in size of the lesion over more than 2 years. The LI-RADS diagnostic algorithm, the principles of the classification approach as well as the correspondence of the different categories.

2.2.3. Collection of CT Data

Scannographic acquisition

All examinations were carried out on a 16-slice scanner (Somatom FORCE, Siemens Healthcare, Forchheim, Germany, manufactured in 2005) which has been in service for 6 years. The technical protocol for CT angiography is summarized in Table 1. The protocol presented below is routinely practiced in this department in adults after preparation made by exclusion of contraindication factors to the use of an iodized contrast product. A CT scan with contrast injection was performed after the injection of 100 ml of omnipaque 350 mg at a rate of 3.5 to 4.0 ml/s during a series without injection. After an injection-scan delay of 4 to 28 seconds as determined by the bolus tracking software, sonographic angiography was obtained at 120 kVp, 300 to 400 mA. Collimation was 0.5 mm

Table 1. Contrast medium application protocol and parameters.

Detectors	16
kV	120
mAs	150
Turnaround time	0.5 s
Pitch	1.2
Slice collimation	3 mm
Slice width/increment	2/1.4mm
Iterative reconstruction	Model-based algorithm (ADMIRE, Siemens Healthcare, Forchheim, Germany)
Reconstruction Force	Level 3
Reconstruction core	Bf40
Post treatment	MPR, VRT and MIP
Automatic injector	Envision CT injector EHU 700, Medrad

with reconstruction of 1.25 to 2.0 mm. The scans were interpreted a second time to obtain all the study criteria by a 4th year medical imaging assistant, using PACS. The reading was taken in the pulmonary parenchymal window and in the mediastinal window (Table 2).

2.3. Statistical Analyzes

The data entered into Excel 2010 software (encoding) were then exported to IBM SPSS 21 (Statistical Package for Social Sciences), version 21.0 for processing and analyses. Means and standard deviation were calculated for symmetrically distributed quantitative data, relative proportions (%) and absolute proportions (n) for categorical data. The Pearson chi-square test was carried out to compare the proportions between categorical variables, while the T-student test allowed us to compare the means. The calculation of Odds Ratio (OR) made it possible to determine the strength of association with a 95% confidence interval. For all tests carried out, the statistical significance threshold (p-value) will be $p < 0.05$.

3. Results

3.1. Incidence of Liver Pathology in the Population

The incidence of liver pathology diagnosed on CT. From 2018 to 2022, the Le Rocher imaging service welcomed 2370 patients who had an abdominal scan, including 304 who had a liver lesion. The incidence of liver disease in this population was therefore 12.8%.

3.2. General Characteristics of the Study Population

Table 2 below provides information on the general characteristics of the study population. Out of a total of 304 cases, 174 cases (57.2%) were female and 130

(42.8%) were male with an F/M sex ratio of 1.3. The mean age was 55.42 ± 16.6 years with the range from 35 to 71 years. The age group of 50 to 59 years old was the most represented, followed by that of 60 years old to 69 years old and the other groups. Among the indications for CT examinations, the characterization of a mass and the exploration of cholestasis represented the most frequent indications.

3.3. Diagnostic Interpretations of CT

Table 3 below provides us with information on the relative frequencies of CT diagnoses used in our environment. Solid masses were the most common lesions found in 65.8% of cases, followed by diffuse pathologies with 45.4% of cases. Traumatic pathologies were the least frequently found with 3.3% of cases.

Table 2. General characteristics of the study population.

VARIABLES	Number n = 304	%	X ± ET	Min-Max
Age (years)			55.4 ± 16.6	35 - 71
≤40	18	5.9		
40 - 49	70	23.0		
50 - 59	98	32.2		
60 - 69	86	28.3		
≥79	32	10.5		
Sex ratio (F/M)	1.3	-		
Male	130	43		
Feminine	174	57		
Indication				
Characterization of a mass	132	43.4		
Exploration of cholestasis	76	25.0		
Lucky find	34	11.2		
Complication cirrhosis	26	8.6		
Search for metastasis	24	7.9		
Posttraumatic assessment	12	3.9		

Table 3. Distribution of patients according to the CT diagnoses retained.

VARIABLES	Number n = 304	%
Solid masses	200	65.8
Diffuse pathology	138	45.4
Dilatation of the bile ducts	120	39.5
Fluid masses	70	23
Posttraumatic pathology	10	3.3

3.3.1. Masses on CT

The different solid masses diagnosed

Above, Figure 3 shows that out of a total of 222 solid masses diagnosed on CT, solid lesions classified LI-RADS 5 were the most found in a proportion of 26.1% followed by lesions classified LI-RADS 4 in 18% of cases, metastatic lesions in 12.6% and cholangiocarcinoma in 9%.

3.3.2. Fluid Masses Diagnosed

Above, Figure 4 shows that out of a total of 70 fluid masses diagnosed on CT, biliary cysts were the fluid masses most found in 42.9% followed by abscesses in 37.1%.

The different masses diagnosed according to the age and sex of the patients

Table 4 below provides information on the comparison of fluid and solid masses in relation to the sex and age of the patients. Female subjects were in the

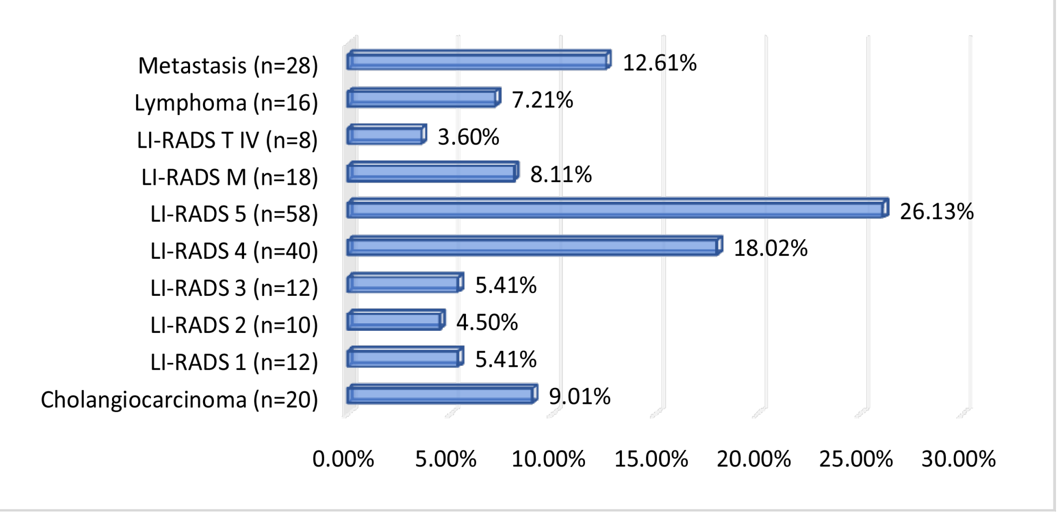

Figure 3. Distribution of patients according to the different solid masses diagnosed.

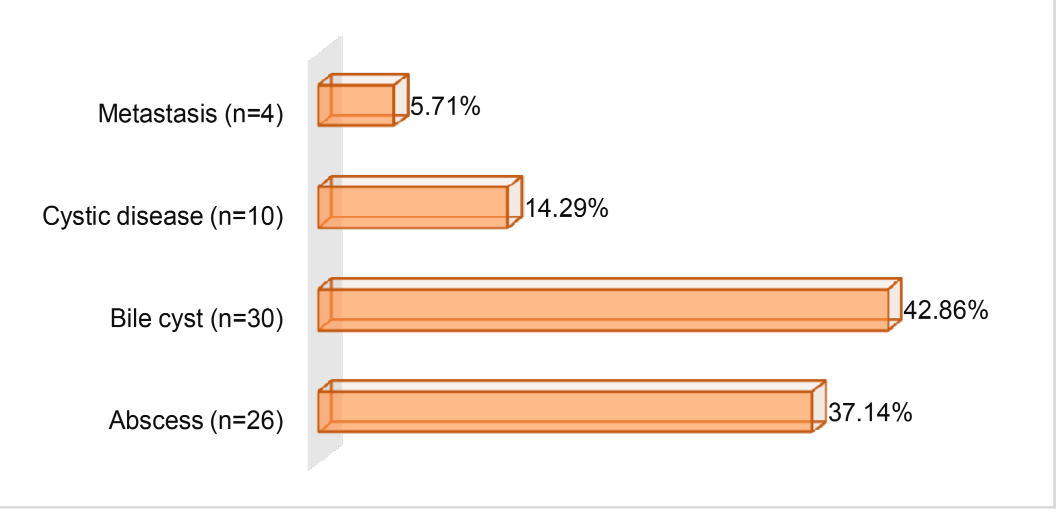

Figure 4. Distribution of patients according to fluid and metastatic masses.

majority in solid (54%) and fluid (65.7%) masses with a statistically significant difference compared to male subjects ($p = 0.001$). Furthermore, the average age of patients with solid masses (57.2 ± 9.9 years) was statistically higher ($p = 0.031$) compared to the average age of patients with fluid masses (49.7 ± 9.8 years). On the other hand, when comparing the age groups, we did not find a statistically significant difference.

3.3.3. Dilations of the Hepatic Bile Ducts on CT

Table 5 below shows us information on bile duct dilations. It appears that the dilations of the VBIH and VBEH were in the majority in a proportion of 70.8%. These dilations were accompanied by detectable mass in 88.2%. The same observation was made in the dilatations of VBIH and normal VBP (n = 35) which were accompanied by tumor lesion in 88.6%.

3.3.4. Diffuse Hepatic Pathologies on CT

1) The different diffuse pathologies diagnosed

Above, Figure 5 provides us with information on diffuse pathologies. Out of a total of 146 cases of diffuse pathologies observed, cirrhosis was found in 85%

Table 4. Distribution of patients according to type of mass in relation to sex and age

VARIABLES	Solid masses n = 200	Fluid masses n = 70	p
Sex			0.001
Male	92 (46)	24 (34.3)	
Feminine	108 (54)	46 (65.7)	
X ± AND	57.2 ± 9.9	49.7 ± 9.8	0.031
age range			0.071
<40 years	14 (7)	12 (17.1)	
40 - 49 years old	38 (19)	24 (34.3)	
50 - 59 years old	58 (29)	22 (31.4)	
60 - 69 years old	60 (30)	8 (11.4)	
>70 years	30 (15)	2 (2.9)	

Table 5. Distribution of patients according to bile duct dilations.

VARIABLES	Number n = 120	%
Dilation of VBIH and VBEH	85	70.8
With detectable mass	*75*	*88.2*
Without detectable mass	*10*	*11.8*
Dilatation of VBIH and normal VBP	35	29.2
Tumoral	*31*	*88.6*
Cholangiopathy	*4*	*11.4*

compared to 15% of cases for fatty liver.

2) The different diffuse pathologies diagnosed according to age and sex

Below, Table 6 shows us the comparison of the proportions between diffuse pathologies (cirrhosis and steatosis) in relation to the age and sex of the patients:

3.3.5. Traumatic Hepatic Pathologies on CT

The different traumatic liver injuries diagnosed

Above, Figure 6 shows that grade I traumatic pathologies were the most

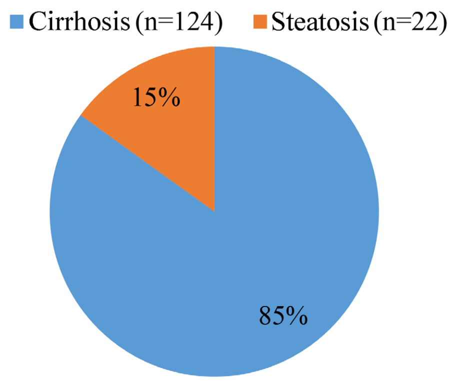

Figure 5. Distribution of patients according to the diffuse pathologies observed.

Table 6. Distribution of diffuse pathologies according to the sex and age of patients.

VARIABLES	Cirrhosis n = 124	Steatosis n = 22	p
Sex			0.071
Male	51 (44.7)	10 (45.4)	
Feminine	63 (55.3)	12 (54.6)	
Age			0.051
<40 years	7 (6.2)	2 (9.1)	
40 - 49 years old	32 (28.1)	5 (22.8)	
50 - 59 years old	39 (34.2)	10 (45.4)	
60 - 69 years old	26 (22.8)	3 (13.6)	
>70 years	10 (8.7)	2 (9.1)	

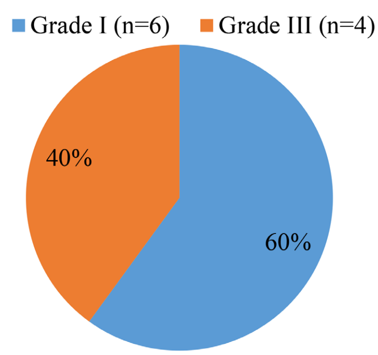

Figure 6. Distribution of patients according to the traumatic pathologies observed.

observed in a proportion of 60%.

4. Discussion

Epidemiology of Liver Pathologies Diagnosed on CT

From 2018 to 2022, the Le Rocher imaging service welcomed 2,370 patients who had an abdominal scan, including 304 who had a liver lesion. The incidence of liver disease in this population was therefore 12.8%.

The present study considered for evaluation, a total of 304 cases among which 174 cases (57.2%) were female versus 130 (42.8%) were male cases without predominance according to the proportions. The mean age was 55.42 ± 16.62 years with the range from 35 to 71 years. The age group of 50 to 59 years old was the most represented, followed by that of 60 years old to 69 years old and the other groups. The shows a non-significant predominance ($p < 0.05$) of the female gender over the male gender across all age groups.

In the study by (Alhyari et al., 2022), (34) 76.9% (n = 173) were men and 52 (23.1%) were women. The mean age of the patients at the time of the ultrasound examinations was 65 ± 10 years (range: 18 to 89 years). All patients had clear sonographic or radiological signs of liver cirrhosis and CL was further confirmed histologically in 111/225 (49.3%) of the patients. The most common etiology of CL was alcohol (55.1%).

Out of a total of 222 solid masses diagnosed on CT, solid lesions classified LI-RADS 5 were the most found in a proportion of 26.1% followed by lesions classified LI-RADS 4 in 18% of cases (Tanabe et al., 2016). Gallbladder cancer is the most common malignancy of the bile ducts. It is a relatively common tumor in the elderly, with a poor prognosis, with a survival rate of 5% at 5 years except for cases discovered on a cholecystectomy specimen (Tanabe et al., 2016). The development of imaging means, the improvement of spatial resolution and the possibility of producing fine sections (CT and MRI) have enabled the positive diagnosis, the study of the extension and the classification of gallbladder tumors (Tang et al., 2015). Primary malignant lesions of the gallbladder account for 3 to 4% of all malignant lesions. The peak frequency occurs after age 60 with a clear female predominance (Tanabe et al., 2016). The recognized risk factors for this cancer are: the presence of stones (found in 70%), a history of chronic cholecystitis and the existence of a vesicle with a calcified wall (porcelain vesicle) (Tanabe et al., 2016).

Out of a total of 70 fluid masses diagnosed on CT, biliary cysts were the fluid masses most frequently found in 42.9% followed by abscesses in 37.1%. The high frequency of biliary cysts, which are completely benign and usually asymptomatic, should not lead to the potential diagnostic difficulties of cystic liver lesions being underestimated. You must be able to recognize a reworked liver cyst, but also know how to evoke and discuss a fluid mass of another origin, congenital, tumoral, inflammatory, etc.

The diagnostic approach is different, depending on whether we are faced with a single lesion or few lesions, or with disseminated lesions. The analysis of the limits, the appearance of the contents, in particular on MRI and the proximity to the biliary tree are important criteria to guide the diagnosis. Certain infrequent but characteristic aspects are worth remembering (Tanabe et al., 2016). Hemangioma, the most common non-cystic liver lesion and discovered incidentally in the majority of cases, can in certain situations pose diagnostic problems in imaging (Tanabe et al., 2016).

Limitations: Documentary study, Absence of anatomopathology data, Absence of comparison with ultrasound and MRI data.

5. Conclusion

This investigation, which aimed to describe the CT aspects of the liver pathologies observed at the CIMR, allowed us to make the following observations: CT makes it possible to highlight liver pathologies in a certain frequency. Solid lesions classified LI-RADS 5 and LI-RADS 4 are the most common. While biliary cysts and abscesses are the most commonly found fluid masses. Female subjects are in the majority in solid and fluid masses with a statistically significant difference when compared to male subjects. Furthermore, the average age of patients with solid masses is higher compared to the average age of patients with fluid masses.

Conflicts of Interest

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

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