

The Role of Percutaneous Drainage in the Management of Liver Abscesses: Moroccan Series

H Abid, FZ Hamdoun*, G Ousseur, A Lamine, M Lahlali, N Lahmidani, M El Yousfi, D Benajah, M El Abkari, N Aqodad and SA Ibrahim

Department of Hepato-Gastro-Enterology, University Hospital Hassan II - Fez, Faculty of Medicine - Fez, University Sidi Mohammed Ben Abdelal - Fez, Morocco

***Corresponding Author:** FZ Hamdoun, Department of Hepato-Gastro-Enterology, University Hospital Hassan II - Fez, Faculty of Medicine - Fez, University Sidi Mohammed Ben Abdelal - Fez, Morocco.

Received: November 06, 2020; **Published:** December 10, 2020

Abstract

Liver abscesses are on the increase due to the rise in immunosuppressive factors and advances in abdominal surgery. There are few data regarding the epidemiology, clinical, microbiological and prognosis of liver abscesses in Morocco. The aim of this work is to study the place of percutaneous drainage in the management of hepatic abscesses. This is a retrospective, mono-centric study that included all patients with hepatic abscesses treated in the gastroenterology department and having benefited from percutaneous drainage of liver abscesses over the period from January 2009 to December 2018. 130 patients were included in this study, the sex ratio M/F was 1.5 showing a slight male predominance, the average age was 64.8 years; the comorbidities were dominated by diabetes in 18.4%. Abdominal pain was the main symptom present in 72.3% of our patients. Ultrasound was performed for all our patients, revealing the presence of a single abscess in 69.2% of cases. CT scan was done in 40.7% only. The etiology was hepatobiliary in 45.1% of patients. However, no etiology was found in 43.07% of cases. Percutaneous drainage guided by ultrasound was performed in all our patients with bacteriological and parasitological study. The overall success rate of percutaneous drainage was 92.3%. Three patients underwent surgery: in 2 patients secondary to drainage failure and in one other patient following peritonitis. Five deaths were noted in our series: septic shock in 2 cases, decompensation of heart disease in 1 case and pulmonary embolism in 2 others.

Keywords: Liver Abscess; Ultrasound; Percutaneous Drainage

Introduction

Liver abscess (LA) can be defined as a suppurative cavity associated with the invasion and multiplication of microorganisms at the expense of healthy or pathological liver tissue [1]. It is a relatively rare condition, with an incidence that is difficult to determine. However, the frequency appears to increase with age and comorbidities [2]. They are caused by bacteria, parasites, and more rarely, fungi. Laboratory and morphological examinations allow a diagnosis without a great difficulty in most cases. Treatment of LA is dominated by antibiotic therapy and ultrasound-guided drainage, but surgery may be necessary in some cases. The prognosis is conditioned by the patient's comorbidities, the speed of the diagnosis and the therapeutic management as well as the germ in cause of this affection. The aim of this work is to show the place of percutaneous drainage in the management of hepatic abscesses.

Materials and Methods

In this study, 130 patients were admitted for LA in the gastroenterology department over a period of 10 years (from January 2009 to December 2018). All included patients were diagnosed for liver abscess and required a percutaneous treatment. Infected hydatid cysts treated by guided ultrasound drainage were also listed. Patients treated exclusively with antibiotic therapy alone and/or immediate surgery were excluded from our study.

Data collection was done retrospectively using an operating sheet established after review of the literature, based on the HOSIX computer system.

Results

The average age of our patients was 64.8 years [20; 93]. The sex ratio M/F was 1,5. The comorbidities were varied: 18.4% of patients were diabetic, 3.8% were immunosuppressed, 2.3% were ethylic and only 1 patient was cirrhotic (Table 1). Clinically, abdominal pain in the right hypochondriac was present in 72.3% of our patients followed by vomiting in 29.2%. Fever was objectified in 66.15% with a deterioration of the general condition in 41.5% of cases. Biologically, the blood count was performed in all our patients and demonstrated hyperleukocytosis in 61.5% of cases. Only one case of leukopenia was found, it was of a patient undergoing radiotherapy for cavum neoplasia. The CRP was performed in all patients; it was high in 63%. Bacteriological pus sampling was performed in all our patients who came back positive in 47% of cases, with individualization of *E. coli* in 30% of cases, followed by *Klebsiella* and *Pseudomonas* in 4.6% of cases (Table 1).

Characteristics	N (%)
Middle age	64,8 [20; 93 ans]
Sexe ratio (M/F)	1,5
Comorbidities	
• Diabetes	24 (18,5%)
• Immunosuppression field	5 (3,8%)
• Ethylism	3 (2,3%)
• Cirrhosis	1 (1%)
Clinical	
• Hepatic colic	94 (72,3%)
• Vomiting	38 (29,2%)
• Fever	86 (66,15%)
• Alteration of the general condition	54 (41,5%)
Bacteriological study of pus	61 (47%)
• <i>E. coli</i>	39 (30%)
• <i>Klebsiella</i>	6 (4,6%)
• <i>Pseudomonas</i>	6 (4,6%)
• Others	16 (12,4%)

Table 1: Epidemiological, clinical and biological characteristics of the patients in our series.

Abdominal ultrasound (Table 2) was performed in all our cases and revealed a single hepatic abscess in 69.2% and multiple (two abscesses or more) in 30.7% of cases. The location was preferentially at the right lobe in 50.70% of cases, left lobe involvement was found in 31.5% and in 17.6% of cases both lobes were affected. The ultrasound was also oriented towards the etiology by objectifying cases of gallbladder stones, lithiasis of the common bile duct and pyocholecyst. Abdominal CT was performed in 40.7% of our patients and showed 58.4% of unique abscesses, with preferential localization in the right lobe. The CT scan also revealed cases of gallbladder stones, one case of perforated and fistulized gallbladder in the duodenum, one case of biliocystic fistula, one case of pleural fistula, one thoracic fistula and one case of bile duct tumor. The MRI was requested in 40 patients (30.7%) and had shown: 5 cases of gallbladder stones, 7 cases of bile duct stones, 2 cases of dilation of the VBIH and the VBP without any identified obstacle, one case of choledoco-duodenal fistula, and in 8 patients the MRI was without abnormalities. Endoscopy had also a place in the etiological assessment, comprising upper endoscopy and colonoscopy which were performed in 15 patients. Upper endoscopy objectified one case of fundus tumor, one case of pyloric fistula orifice, esophageal varices and a portal hypertension gastropathy in one case (known as cirrhotic), two cases of uncomplicated bulb ulcer and one case of stenosing bulbar ulcer. Colonoscopy objectified 2 cases of millimetric sessile colonic polyps and one case of uncomplicated diverticulosis.

Characteristics	N (%)
Numbers	
• Unique	90 (69,2%)
• Multiples (2 or more)	40 (30,7%)
Location	
• Right lobe	94 (72,3%)
• Left lobe	38 (29,2%)
• Both	86 (66,15%)
Etiologies	
• Biliary	39 (30%)
• Portal	6 (4,6%)
• Cryptogenetics	85 (65,38%)

Table 2: Characteristics of hepatic abscesses on imaging.

In our series, we identified the etiology in only 56.93% of cases (n = 74). The most common etiology was biliary in 45.1% of cases followed by hydatid cyst infection in 6.15% and portal origin in 2.8% of cases.

After hospitalization and conditioning (hydro-electrolyte supply depending on ionic disorders, insulin therapy for diabetics and analgesics associated with probabilistic antibiotic therapy and then adapted according to the antibiogram), all of our patients have undergone percutaneous drainage guided by ultrasound after starting antibiotic therapy. The technique began with the localization of the collection. Local anesthetic was infiltrated in the proposed area of puncture followed by the introduction of the puncture needle (18 G) then the introduction of the guide wire. The tract was dilated with plastic dilators. Pigtail catheter was then passed over the guide wire which was taken out, and the catheter was fixed to the skin using 1-0 Silk suture. The catheter was attached to a collecting bag via the supplied connector. The mean duration of drainage was 13.5 days [6; 27]. The outcome was favorable with a disappearance of fever and pain reduction

or disappearance in the majority of patients (92% N = 120) (Table 3). Initial success was obtained in 92.3% of cases against two cases of technical failure and one case of peritonitis requiring surgery. An accidental fall of the drain was noted in 3 patients who required a second drainage with good progress, and in 4 patients the drain was blocked. 11 cases of recurrence after the initial drainage were identified requiring a second percutaneous treatment.

Characteristics	N (%)
Average duration	13,5 [6; 27 jours]
Initial success	120 (92,3%)
Recurrence	11 (8,46%)
Death	5 (3,84%)
• Septic shock,	2 (1,5%)
• Decompensation of heart disease	1 (0,76%)
• Pulmonary embolism	2 (1,5%)

Table 3: Evolution after percutaneous drainage.

There were 5 cases (3.8%) of death in our series: two patients following a septic shock, one patient following a decompensation of his heart disease and two patients following a pulmonary embolism.

Discussion

The age of onset of liver abscesses is highly variable, according to the literature, the average age of patients ranged from 35 to 61.6 years with extremes ranging from 13 to 85 years. In most of the series from developed countries, the patients were elderly unlike developing countries where most of the patients were under 50 years old [3.4, 5.6, 7.8]. In our series, the age of our patients varied between 21 and 85 years with an average of 64.8 years. The distribution by sex in our series shows a male predominance, what joins the majority of studies in the literature where the sex ratios M/F varied between 1.44 and 13.3 [3,8-10].

Diabetes is the most widely reported in the literature for favorising the development of hepatic abscess. Almost all of the studies reported proportions varying between 9% and 56% [4,5,7,9,11,12]. Chronic ethylism is also frequently cited in the literature as a contributing factor in proportions ranging from 2.3% to 72% [7,9,12]. Immunosuppression states (HIV positive, long-term corticosteroid therapy, cancer radiochemotherapy) have also been reported by several authors [4,9,11,12]. Changxi Zhang, *et al.* [12] were interested in studying pyogenic liver abscess (PLA) after radical surgical resection of hilar cholangiocarcinoma (HC). They have showed that intraoperative vascular reconstruction and positive margin status pose greater risks for PLA formation after radical resection of HC. In our series: 18.4% of our patients were diabetic, 3.8% had immunosuppression state, 2.3% were chronic ethyl and only 1 patient was cirrhotic.

Clinically, our results agree with those in the literature with predominance of fever and abdominal pain in more than 95% of patients [3,6,7,11]. Biologically, hyperleukocytosis was reported by almost all authors; the percentages vary between 72% and 91% [4,7,9,11-13]. Elevated CRP was present in all series at percentages ranging from 85 to 100% of cases. In our series, 61.5% had hyperleukocytosis and CRP was positive in 63% of patients. According to the literature, the isolation of the germ was carried out in 60 to 90% of samples [14-16]. In our study, it was positive only in 47% of cases, with predominance of infection with *E. coli* in 30% of cases then *Klebsiella* and *Pseudomonas* in 4.6% each others.

Abdominal ultrasound is the first-line examination allowing to make a positive etiological diagnosis, to monitor the progress and mainly to contribute to the treatment by the guidance of the percutaneous drainage [17]. In the literature, most patients have a single liver abscess; the percentages reported range from 64% to 91%, with a preferential localization in the right lobe between 70 and 90% [3,4,7,20], which meet the results of our study. The abdominal CT has a greater sensitivity than abdominal ultrasound and also allows a guided puncture, which must be requested systematically and carried out with an acquisition without then after injection of an iodinated contrast product in the arterial and portal phases [21]. The CT scan allows the etiological assessment of the abscess (complicated diverticulosis, colonic tumor, appendicitis...) and detects, with excellent sensitivity, the complications of the abscess, such as pleural effusion or vascular thrombosis [22,23]. The rest of the etiological assessment is based on magnetic resonance cholangiography which remains the best examination for studying bile ducts. In the absence of an obvious biliary cause, an upper and lower endoscopy is necessary to rule out an underlying digestive neoplasia that caused the hepatic abscess [24]. The most reported etiology in the literature [18,19] was the biliary origin which joins our series.

Treatment is based on resuscitation measures and empirical antibiotic therapy then adapted according to the antibiogram [12,17]. In our series, which thus in the literature, the method most used is SELDINGER's technique associated with an adequate antibiotic treatment with an estimated success rate of 97 to 98% [17,20].

The reported complication rate is generally less than 10% with the exception of Mezhir, *et al.* study's where this rate is highly estimated at 12% of complications [11]. A prospective study, of 601 patients over six years, have shown that the rate of recurrence was significantly higher for biliary abscess (23.8%) than for cryptogenetic (2%) or occurring in diabetics (4%). From a microbiological point of view, *E. coli* was more frequently found in abscesses of biliary origin, while *K. pneumoniae* was the most common germ found in diabetics [25]. In our series, the combination of good antibiotic therapy and percutaneous drainage was associated with a success rate of 92.3%, 2 cases of failure with one case of peritonitis were identified requiring surgery. Soumik, *et al.* reported a mortality rate of 2.5%, Mezhir, *et al.* reported 26% deaths, while Heneghan, *et al.* reported 0% mortality [16,21,30]. In our series, there were 5 cases of death: two patients following a septic shock, the third following a decompensation of his heart disease and two others following a pulmonary embolism.

Conclusion

The diagnosis of liver abscesses is based on clinical, biological and radiological elements. The etiologies of liver abscesses are very diverse. In the light of our study, antibiotic therapy combined with percutaneous drainage is the treatment of choice for liver abscesses with an overall success rate of 92.3%. Surgery should be reserved for complications and the existence of a cause requiring surgical treatment.

Bibliography

1. J Grellet and C Davy-Miallou. "Anatomie radiologie du foie". Encycl Med Chir (paris-france), Radiodiagnostic-Appareil digestif (1994): 16.
2. E Yahchouchi D and Cherqui. "Abcès non parasitaires du foie, Diagnostic et conduite à tenir". EMC, Hépatologie (1998): 8.
3. Dhaval O Mangukiya, *et al.* "A Prospective Series Case Study of Pyogenic Liver Abscess: Recent Trends in Etiology and Management". *The Indian Journal of Surgery* 74.5 (2012): 385-390.
4. Helen M Heneghan, *et al.* "Modern management of pyogenic hepatic abscess: a case series and review of the literature". *BMC Research Notes* 4 (2011): 80.
5. MA Abusedera and Ashraf MEB. "Percutaneous treatment of large pyogenic liver abscess". *The Egyptian Journal of Radiology and Nuclear Medicine* 45 (2014): 109-115.

6. L Karkowski, *et al.* "Abcès hépatiques à pyogènes. Étude descriptive retrospective". *La Revue de Médecine Interne* 36S (2015): A100-A211.
7. Soumik Ghosh, *et al.* "Clinical, Laboratory, and Management Profile in Patients of Liver Abscess from Northern India". *Journal of Tropical Medicine* (2014): 8.
8. Ryan Z Swan, *et al.* "Current treatment of pyogenic liver abscesses: analysis of a multi-modal step-wise algorithmic approach". Scientific Poster Presentations 2015 Clinical Congress. Journal of the American College of Surgeons.
9. O'Farrell, *et al.* "Pyogenic liver abscesses: Diminished role for operative treatment N". *Journal of the Royal Colleges of Surgeons of Edinburgh and Ireland* (2010): 192-196.
10. Wing-Chiu Ng, *et al.* "Audit of management of Pyogenic liver abscess in a tertiary referral hospital". *Surgical Practice* 12 (2008): 7-10.
11. James J Mezhir, *et al.* "Current Management of Pyogenic Liver Abscess: Surgery is Now Second-Line Treatment". *Journal of the American College of Surgeons* 210 (2010): 975-983.
12. Changxi Zhang, *et al.* "Risk factors, management, and prognosis for liver abscess after radical resection of hilar cholangiocarcinoma". *International Journal of Clinical and Experimental Medicine* 8.11 (2015): 21279-21286.
13. J-R Ibara, *et al.* "Abcès du foie a germes pyogènes aspect clinique morphologique et étiologique –à propos de 38 cas". *Médecine d'Afrique Noire* 47 (2002): 92-96.
14. Cohen JL, *et al.* "Liver abscess the need for complete gastrointestinal evaluation". *Arch Surg Journal* 124 (1989): 563-564.
15. Gillion JM, *et al.* "Abcès à pyogènes du foie". *Annales de Medecine Interne* 142.2 (1991): 109-113.
16. Kam M, *et al.* "Appmt de l'échographie nu diagnostic hde rupture d'abcès du foie Dakar medical 36 (1991): 2.
17. Jean Pierre Tasu, *et al.* "L'abcès du foie vu par le radiologue: du diagnostic au traitement". *Gastroentérologie Clinique et Biologique* 28 (2004): 477-482.
18. Ortale JR and Borges Keiralla LC. "Anatomy of the portal branches and the hepatic veins in the caudate lobe of the liver". *Surgical and Radiologic Anatomy* 26 (2004): 384-391.
19. Carine Chagneau-Derode and C Silvain. "Abcès bactériens du foie". *Gastroentérologie Clinique et Biologique* 28 (2004): 470-476.
20. Alvarez Pérez JA, *et al.* "Clinical course, treatment, and multivariate analysis of risk factors for pyogenic liver abscess". *The American Journal of Surgery* 181 (2011): 177-186.
21. C Silvain C, *et al.* "Abcès non parasitaires du foie, Diagnostic et conduite à tenir". *EMC, Hépatologie* (2006).
22. Lederman ER and Crum NF. "Pyogenic liver abscess with a focus on Klebsiella pneumoniae as a primary pathogen: an emerging disease with unique clinical characteristics". *The American Journal of Gastroenterology* 100 (2005): 322-331.
23. Wojcicki M, *et al.* "Biliary tract complications after liver transplantation: a review". *Digestive Surgery* 25 (2008): 245-257.
24. E Lafont, *et al.* "Dokmak. Abcès du foie". *Journal Des Anti-Infectieux* (2017).
25. Cheng HP, *et al.* "Extended-spectrum cephalosporin compared to ceftazidime for treatment of Klebsiella pneumoniae-caused liver abscess". *Antimicrobial Agents and Chemotherapy* 47 (2003): 2088-2092.

Volume 8 Issue 1 January 2021

©All rights reserved by FZ Hamdoun, *et al.*