

PARTICULARS OF MEDICAL AND SURGICAL TREATMENT OF LIVER ABSCESS IN SEPTIC PATIENT- CASE REPORT

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ABSTRACT

First described by Bright in 1836, who reports two cases secondary to suppurative angiocolitis and pilephlebitis, intrahepatic suppurations were, until the era of the discovery of antibiotics, one of the most dreaded causes of mortality, reaching a rate of almost 100%. Today, both the incidence of liver abscesses and the mortality rate have been significantly reduced, as the introduction of antibiotics has dramatically reduced the number of septic piles due to peritoneal outbreaks. Their etiology is more recently, most frequently, a biliary or neoplastic disease. On the other hand, the improvement of germ isolation techniques has made it possible to identify anaerobic germs with maximum frequency, and diagnostic and treatment performance has increased so much with the advent of non-invasive or minimally-invasive procedures that the overall mortality rate of 70% in 1975 is now about 30-38%.

We present the case of a 75-year-old male patient with no known history of illnesses who is admitted for fever, chills, myalgia, arthralgia and visual disturbances with onset of approximately one week. Biologically he presents with leukocytosis with marked neutrophilia, mild thrombocytopenia and significant biological inflammatory syndrome. Suspicion is raised for a diagnosis of Sepsis with unspecified starting point with possible pyogenic cavernous sinus thrombosis, a complication suggested by the presence of visual disturbances. Neuro-imaging evaluation by CT and brain MRI is performed, with the diagnosis of thrombosis being refuted. Abdominal CT is performed which identifies a space replacement formation in the left hepatic lobe for which MRI evaluation is required. MRI detects an expansive hepatic formation with semiology suggestive of liver abscess. Treatment was instituted with a combination of broad-spectrum antibiotics and antifungal treatment, but the evolution was unfavourable with maintenance of leukocytosis with marked neutrophilia and progression of inflammatory samples. It was necessary to evaluate the case by a multidisciplinary team (infectious disease specialist, gastroenterologist, surgeon) to establish the appropriate therapeutic management, with surgical resolution of the case, with a favourable postoperative evolution.

Keywords: abscess, sepsis, surgery

Introduction

First described by Bright in 1836, who reports two cases secondary to suppurative angiocolitis and pilephlebitis, intrahepatic suppurations were, until the era of the discovery of antibiotics, one of the most dreaded causes of mortality, reaching a rate of almost 100% (1). Today, both the incidence of liver abscesses and the mortality rate have been significantly reduced, as the introduction of antibiotics has dramatically reduced the number of septic piles due to peritoneal outbreaks. Their etiology is

more recently, most frequently, a biliary or neoplastic disease (1).

On the other hand, the improvement of germ isolation techniques has made it possible to identify anaerobic germs with maximum frequency, and diagnostic and treatment performance has increased so much with the advent of non-invasive or minimally-invasive procedures that the overall mortality rate of 70% in 1975 is now about 30-38% (2).

Liver abscesses are purulent collections developed in the liver parenchyma and separated from it by a capsule of transformed liver tissue and

fibrous tissue (2). Liver abscesses are classified into pyogenic (caused by microbial germs) and parasitic (caused by protozoa). In developed countries, pyogenic abscesses account for three quarters of liver abscesses, while in the rest of the world amoebic abscesses are more common. The classic picture described by Ochsner in 1938 referred to young males with liver abscess secondary to pilephlebitis of appendiceal origin (2).

Case report

We present the case of a 75 years old patient with known history of cardiovascular comorbidities, with no history of hospitalization and no recent travel outside the country.

From the history of the disease we note the onset of symptoms was about 7 days with high fever, chills, myalgia and arthralgia, with an initial presentation to the Local Hospital where, following the clinical picture described by the patient and the current epidemiological context, the suspicion of SARS-CoV-2 infection was raised. SARS-CoV-2 testing was performed, the result being negative, the patient was referred home receiving symptomatic treatment recommendations. Because the clinical picture with fever remained and with sudden onset of visual disturbances, the patient had presented to the Emergency Hospital, where biological and imaging evaluation was performed. Pulmonary imaging showed changes of bronchiolitis, and from a bio-humoral point of view, leukocytosis with marked neutrophilia, lymphopenia, mild thrombocytopenia, hepatocytosis syndrome, azotat retention samples were present. It was decided the admission on the Internal Medicine Department with high suspicion of SARS-CoV-2 infection, with collection of RT PCR-SARS-CoV-2.

The physical examination on admission, evidenced a conscious patient, cooperative, afebrile at the time of examination, with symmetrical facies, with visual disturbances with cytositis and anisocoria involving the right eye, no signs of meningeal irritation, normal colored integuments and mucous membranes, cardio-circulatory and respiratory balanced, Sp O₂ 96% oxygen saturation in atmospheric

air, abdomen supple, painless spontaneously or on palpation, no digestive disorders, present diuresis, no peripheral edema. Neurological and ophthalmological consultation was requested, with urgent craniocerebral CT, raising the suspicion of a diagnosis of Sepsis with unspecified starting point with possible pyogenic thrombosis of cavernous sinus, a complication suggested by the presence of visual disturbances. The diagnosis of SARS-CoV-2 infection was also refuted, the result of the SARS-Cov-2 RT PCR being negative.

The patient was evaluated neuro-imagingly, both CT and cranio-cerebral MRI, with no acute lesions, thus refuting the suspicion of thrombosis. Following ophthalmological examination, the diagnosis of vitreous haemorrhage with suspected right eye retinal detachment was established.

We considered necessary to perform an additional abdominal-pelvic CT scan, to highlight a possible inflammatory-infectious site, thus revealing an insufficiently characterizable hepatic space replacement formation (Figure 1-3), for which MRI examination was recommended.

The abdominal MRI evidenced a multiloculated cystic formation Ø 13 mm arranged at the level of the II-III-IV hepatic segments, coapposing the left lobar biliovascular branches, compressing the left portal branch.

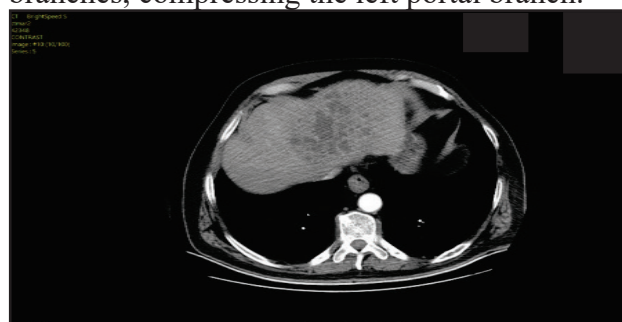


Figure 1: CT-scan of the liver abscess

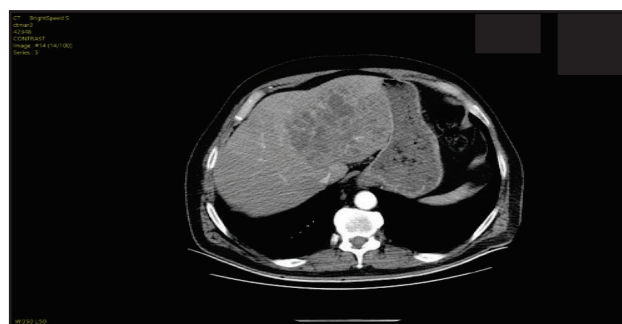


Figure 2: CT-scan of the liver abscess

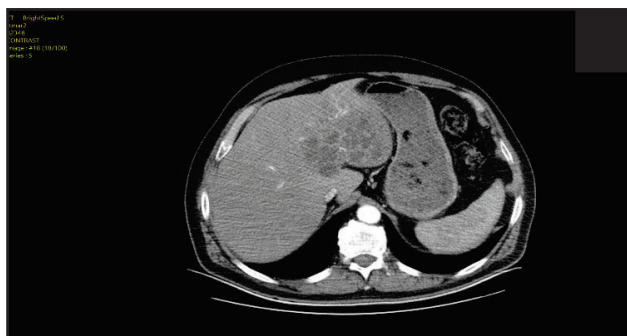


Figure 3: CT-scan of the liver abscess

At this stage the diagnosis of septic state was established, with digestive starting point, marked by the presence of the abscess in the left hepatic lobe. Treatment had been instituted with a combination of broad spectrum antibiotics: Meropenem 1g iv/8h+Metronidazole 500 mg iv/8h+Moxifloxacin 400 mg iv/day and also antifungal.

Because we clearly had a bacteriemia, we considered necessary an echocardiographic evaluation to exclude a possible endocardial insemiation, even if the patient remained hemodynamically stable, without heart failure phenomena. The result was favorable, without valvular vegetations, without endocardial changes.

In the further management, surgical consultation was requested to determine the possibility of surgical approach. The surgeon's indications were to continue broad-spectrum antibiotic therapy, as the patient's clinical state was good, with no painful abdominal complaints and no clinical elements of sepsis. The clinically and biologically evolution in dynamic in the following days, the patient presented with relatively good general condition, afebrile, without shivering, hemodynamically stable, abdomen supple, mobile with respiratory movements, painless spontaneously or on deep palpation, with no signs of muscular defense. Because the bioumoral changes (Table 1) showed raising leukocytosis with marked neutrophilia, with increasing inflammatory samples, the antibiotic regimen was modified, with the discontinuation of Moxifloxacin, and the addition of Vancomycin 1 g/12h iv.

Table 1: Bio-humoral evolution

	Day 1	Day 3	Day 5	Day 7	Day 9
L	26.05	39.74	36.8	24.91	13.00
N	84.9	87	89.8	83.1	83.9
Fib.	531	552	614	587	756
PCR	11.07	11.3	11.43	6.95	10.22
LDH	331	577	-	-	-
D-dim	5.04	8.32	7.02	10.72	6.96
TGO	55	54	28	37	56
TGP	104	102	65	65	101
Crea	0.92	0.97	0.89	0.94	1

A dynamic imaging evaluation was also performed, an abdominal ultrasound which showed the same structure at the level of the left hepatic lobe with extension to the right lobe, a well defined 13 mm formation with vascularized septa separating small avascular hypoechoic areas (Figure 4).

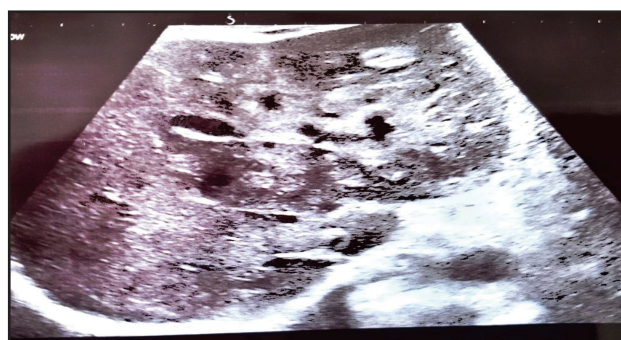


Figure 4: Echographic aspect of the abscess

A new surgical re-evaluation was demanded, with recommendations of minimally invasive treatment to evacuate the abscess by percutaneous echograft drainage in the gastroenterology department.

The Gastroenterology consultation concluded that there is no indication for minimally invasive treatment, being a formation with multiloculated cystic structure that does not lend itself to percutaneous drainage.

A consultation with the head of the general surgery department was requested in order to take over the case and transfer the patient. The abscess was evacuated by classic laparotomy, with incision and evacuation of white creamy content and debridement of the abscess, drainage with tube of the remaining abscess cavity. Suprahepatic drainage with two tubes and subhepatic drainage with one tube was instituted,

with sterile cultures, patient being 14 days on antibiotic treatment prior to surgery.

The postoperative outcome was favorable (Table 2), with discharge after 7 days, with recommendations for antibiotic treatment at home, with dynamic evaluation in the general surgery department. The duration of hospitalization was 28 days.

Table 2: Bio-humoral evolution

	Day 13	Day 14	Day 15	Day 16	Day 17
L	17	18.07	22.52	13.81	9.67
N	84.4	92.9	87.9	80.7	47.8
PCR	-	-	-	5.85	019
LDH	249	299	-	-	-
TGO	71	45	34	44	40
TGO	83	64	47	48	50
Uree	43	33	50	46	33
Crea.	0.99	0.81	0.85	0.89	0.74

Discussions

In most of cases the cause is cryptogenic. The definition of a cryptogenic abscess as a Pyogenic Liver Abscess (PLA) for which no obvious source of infection was found, despite evaluation by imaging methods and the collection of medical history (3) in immunocompetent patients, also found in our case. PLA usually develops in patients with comorbidity. In some cases the main cause found was portal, secondary to abdominal cavity contamination (4). Such results differ from the literature showing preponderance of biliary causes in 44% of patients or, as Pang et al., cryptogenic causes in 34% . Blood and pus cultures were positive in 40% and 65%, respectively (4). The most frequently isolated microorganisms were *E. coli* and *Streptococcus* spp (4).

Also the predisposing factors cited, consisted of biliopancreatic disease in 33%, recent admission in 20%, alcoholism in 15%, diabetes mellitus in 15%, a history of gastrointestinal

neoplasm in 11% and abdominal surgery in 11% (4). The cause was cryptogenic in 65%, biliary in 31%, and portal in 4% (4). In the case of our patient, he didn't presented with history of any of the following, he was known only with cardiovascular comorbidities.

The presentation of a pyogenic hepatic abscess may be unspecific. Abdominal pain, jaundice, fever, inappetence and weight loss are the most common. This strengthens the fact that hepatic abscess diagnosis is made with high clinical suspicion, given the low prevalence and unspecific symptoms. Imaging techniques (echography and CAT) provide the main support in both the diagnosis and treatment (5). It can explain the average of 8.2 days for diagnosis, what suggest subacute evolution (5). The symptoms consisted of fever in 100%, abdominal pain in 65%, vomiting in 37%, enlarged liver in 33%, systemic inflammatory response syndrome in 26%, and jaundice in 9% (5). In the case of our patient, the onset was clearly unspecific without abdominal pain, but the septic state was firmly evidenced by the biohumoral changes, and also by the prolonged febrile state.

As mentioned above, clinical diagnosis is non-specific, so imaging has an important contribution. The abdominal ultrasound had 40% sensibility to diagnose abscesses while abdominal CT scan had 90% (5). Abscesses were located, in majority, in the right hepatic lobe as single abscesses measuring 12.54 cm, Küster-Filho et al. found preponderance of multiple abscesses, in the right lobe, measuring 7.33 cm in average (6). In our case, the location was in the left hepatic lobe, with a diameter of 13 cm, with a multiloculated structure, the imaging diagnosis being established after abdominal MRI.

It is cited that the most common laboratory abnormality among included items was increased C-reactive protein and fibrinogen blood levels, respectively, in 98% and 93.9% of cases (7). These were followed by abnormal total leucocytic count in 77% patients and elevated ALP in 67% of cases (7). Our patient presented with increased inflammatory samples and significant leukocytosis with undulatory evolution under broad-spectrum antibiotic therapy, with real improvement after surgical drainage.

Percutaneous needle aspiration and catheter

drainage has been shown to be beneficial in the treatment of PLA in association with antibiotics: this association is the present standard practice (8). But if the drainage is inadequate, surgical drainage may be required. This option of treatment it must be considered as primary treatment in certain settings, like a complex or ruptured abscess, or in the case of multiple abscesses, or if is a percutaneously unreachable abscess, or a larger abscesses (> 5 cm), or If associated surgical problem is also present (e.g., peritonitis) (9). Drainage may be done laparoscopically. Also another variant of surgical treatment is hepatotomy, in general a successful approach, but improvements in percutaneous techniques make it secondary management in most cases (10). In our case, surgery was postponed due to the epidemiological context of the pandemic, as the indication for surgical treatment was clear from the beginning, given the size of the abscess and its multiloculated structure that did not lend themselves to percutaneous drainage. Fortunately, the prompt broad-spectrum antibiotic treatment instituted in the first 24 hours after admission contributed to the success of the surgery, controlling the septic process.

References

1. Ochsner A, DeBaakey M, Murray S. Pyogenic abscess of the liver: II. An analysis of forty-seven cases with review of the literature. *Am J Surg*. 1938;40(1):292–319.
2. Tarcoveanu E, Vlad N, Moldovanu R, Georgescu S, Bradea C, Lupascu C, et al. Abcesele hepatice piogene. *Chirurgia (Bucur)*. 103(4):417–27.
3. Shi S, Xia W, Guo H, Kong H, Zheng S. Unique characteristics of pyogenic liver abscesses of biliary origin. *Surgery*. 2016 May;159(5):1316–24.
4. López-Cano Gómez M, Laguna Del Estal P, García Montero P, Gil Navarro M, Castañeda Pastor A. [Pyogenic liver abscess: clinical presentation and predictors of unfavorable outcome]. *Gastroenterol Hepatol*. 2012 Apr;35(4):229–35.
5. Santos-Rosa OM Dos, Lunardelli HS, Ribeiro-Junior maf. Pyogenic liver abscess: diagnostic and therapeutic management. *Arq Bras Cir Dig ABCD = Brazilian Arch Dig Surg*. 2016;29(3):194–7.
6. Santos-Rosa Om Dos, Lunardelli Hs, Ribeiro-Junior Maf. Pyogenic Liver Abscess: Diagnostic And Therapeutic Management. *Arq Bras Cir Dig (São Paulo)*. 2016;29(3).
7. Pang TCY, Fung T, Samra J, Hugh TJ, Smith RC. Pyogenic liver abscess: an audit of 10 years' experience. *World J Gastroenterol*. 2011 Mar;17(12):1622—1630.
8. Serraino C, Elia C, Bracco C, Rinaldi G, Pomero F, Silvestri A, et al. Characteristics and management of pyogenic liver abscess: A European experience. *Medicine (Baltimore)*. 2018 May;97(19):e0628.
9. Cai Y-L, Xiong X-Z, Lu J, Cheng Y, Yang C, Lin Y-X, et al. Percutaneous needle aspiration versus catheter drainage in the management of liver abscess: a systematic review and meta-analysis. *HPB Off J Int Hepato Pancreato Biliary Assoc*. 2015 Mar;17(3):195–201.
10. Khan R, Hamid S, Abid S, et al. Predictive factors for early aspiration in liver abscess. *World J Gastroenterol*. 2008;14(13):2089-93.