

AN UNUSUAL CAUSE OF HEPATIC ABSCESS IN A CHILD A CASE REPORT

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Abstract

Pyogenic hepatic abscess (PHA) is the development of a single or multiple intra-hepatic purulent collections, secondary to the local inflammatory cell reaction due to infection of the hepatic parenchyma. The causes are: bacterial spread through the hepatic artery (bacteremia), bacterial spread through the portal vein (gastrointestinal infection), ascending cholangitis, via biliary tract, contiguity from the peritoneal cavity, or superinfection of necrotic tissue. In children, the contiguity cause after appendectomy is rare. We reported a case of a patient presenting fever, abdominal pain, hyporexia, with surgical history of appendectomy for acute appendicitis at stage four six months ago. The patient was previously treated with antibiotic therapy without success. Imaging investigations showed PHA in hepatic segment 7. Due to her age and location of the abscess, a minimally invasive procedure associated with antibiotic therapy was chosen. The patient was discharged and is currently undergoing outpatient follow-up since there was clinical and laboratory improvement. Although not usual, the diagnosis of post-appendectomy PHA should be considered in the differential diagnosis in cases of fever of undetermined origin.

Keywords:

Introduction

Pyogenic hepatic abscess (PHA) is the development of a single or multiple intra-hepatic purulent collections, secondary to the local inflammatory cell reaction due to infection of the hepatic parenchyma [1]. The liver is the abdominal viscera most frequently affected by abscesses. 13% of all intra-abdominal abscesses and 48% of abdominal abscesses are located in it [2]. Their incidence varies from 1.1 to 2.3 per 100,000 inhabitants,

and it is higher among men than women (3.3 against 1.3 per 100,000, respectively). It is a serious and fatal disease if left untreated. Mortality can vary from 5.6 to 80% [1,3].

The main symptoms are abdominal pain, which is more prominent in the right hypochondrium, intermittent fever, jaundice and hepatomegaly. Associated symptoms such as inappetence, weight loss, nausea, vomiting, diarrhea, ascites and pulmonary alterations may also occur [1,2]. Among the laboratory findings, abnormalities in liver biochemistry, mainly the elevation of alkaline phosphatase, bilirubin and aminotransferases, as well as a leukocytosis with left deviation should be expected. It has sub-acute evolution with onset of symptoms varying between 3-120 days [1].

The presence of numerous cells of the reticuloendothelial system (Kupffer cells) in the hepatic parenchyma provides some degree of resistance to infections, however, dual vascularization of the liver makes this organ particularly vulnerable to the formation of PHA, which can result from: bacterial spread through the hepatic artery (bacteremia); bacterial spread through the portal vein (gastrointestinal infection); ascending cholangitis, via biliary tract; contiguity from the peritoneal cavity, or superinfection of necrotic tissue. The right hepatic lobe is the most affected (91%) due to its dominant vascularization [4].

Escherichia coli have been the most commonly isolated pathogen in PHA, accounting for 35-45% of cases worldwide⁵. However, the cause may vary by region and cases of *Staphylococcus aureus*, *Streptococcus*, *Klebsiella pneumoniae* may be found. Some authors have also reported the association of microbiology with etiology. *E. coli* is associated with biliary disease, *Klebsiella* with cryptogenic causes, and *Streptococcus milleri* with portal cause [1,2]. Thus, abscesses are found after obstruction and infection of biliary tree and are associated with underlying diseases such as cancer, colon diseases and diabetes.

The diagnosis is made by history, clinical examination, imaging, followed by aspiration and culture of abscess material. Among the imaging exams, the most outstanding are X-ray, ultrasonography and computed tomography of the abdomen. A simple abdominal X-ray may already provide information such as intrahepatic gas or the portal vein, elevation of the right hemidiaphragm and ipsilateral pleural effusion. Ultrasonography (USG) is usually the first examination requested for diagnostic investigation, although it is inferior to computed tomography (CT) as to sensitivity. CT is the method of choice, since it has greater sensitivity.

Treatment is based on intravenous antibiotic therapy and drainage procedure. Empiric antibiotic therapy should target Gram-negative and anaerobic enteropathogens. The

treatment of choice is: Beta-lactam monotherapy plus beta-lactamase inhibitor (eg. amoxicillin + clavulanate, ampicillin + sulbactam, piperacillin + tazobactam) or combination therapy with third generation cephalosporin (eg. ceftriaxone) or quinolone (eg. ciprofloxacin, levofloxacin) and metronidazole. The minimum recommended duration should be 4-6 weeks and may be prolonged in selected cases [2]. Drainage procedures include percutaneous abscess drainage guided by CT or USG (with or without catheter insertion), drainage surgery, and drainage by endoscopic retrograde cholangiopancreatography (ERCP). The approach depends on the size and number of abscesses.

Case Report

LBSA, female, 11 years old, underwent appendectomy for acute appendicitis in October 2016. According to her family, it was a complicated surgery with phase four appendicitis and peritonitis in the cavity. In the postoperative period, the patient received medical care and antibiotic therapy. On the fourth postoperative day, prior to discharge, purulent drainage was performed through the surgical wound, which was drained and cleaned, with good evolution after discharge. The patient remained in good general condition until April 2017, that is, six months after the initial procedure, when she presented fever, abdominal pain and weight loss. In medical consultations, she received antibiotic therapy for a probable urinary infection and also empirical antibiotic therapy even with no obvious infectious focus. Fever was present daily, especially in the evening, with temperatures ranging from 37.5 to 38.9 °C. She underwent investigative, laboratory and imaging tests, however there was no confirmation of the infectious focus. The patient remained with these clinical manifestations for three months, having lost about ten kilograms of mass.

In a consultation indicated by a general surgeon, the patient was evaluated by a gastrointestinal specialist and underwent new abdominal computed tomography (CT) with contrast protocol for pediatric patients, in which a hypo-echoic lesion was seen in the hepatic segment 7 of approximately seven centimeters, suggestive of partially liquid collection (Figure 1). The hypothesis of a hepatic abscess was raised. The patient was hospitalized in a regular general condition, emaciated, febrile, anicteric, eupneic, with no pulmonary or cardiac auscultation alterations, and abdomen painful with palpation of right hypochondrium, with no signs of peritoneal irritation, negative Murphy and Giordano signs. Antibiotic therapy based on third generation cephalosporin and metronidazole was

introduced after the collection of two blood culture samples. In a multidisciplinary discussion, percutaneous drainage through interventional radiology was chosen. This conduct was based on the fact that the patient is pediatric, there is a single purulent collection, lesion localization is favorable, and it is also less invasive.

The procedure was performed by draining the purulent collection, with a small amount of purulent secretion that was sent to culture, and the Pigtail catheter was left. In the postoperative period, the patient evolved with an improvement in her general condition, febrile picture and abdominal pain, and she also had a small amount of secretion drained through the catheter.

Concerning laboratory results, there was improvement of the C-reactive protein (PCR). The exudate culture was positive for *Streptococcus bovis*, and the antibiogram sensitive to ceftriaxone was maintained. One week after the procedure, an image control with computed tomography was performed, collection emptying was observed, and the catheter was also removed. The patient was discharged from hospital and is currently undergoing outpatient follow-up. In a new image control, disappearance of the lesion of the hepatic segment 7 was verified. The patient is in good general condition, with weight gain, afebrile and without abdominal pain.

Discussion

Hepatic abscess is rare in healthy children and occurs primarily associated with predisposing factors including immunosuppression, chronic granulomatous disease or leukemia, surgery, travels to endemic areas, exposure to animals, trauma, pathologies of biliary tract and neoplasms.

Historically, the most frequent causes of pyogenic hepatic abscess were appendicitis and diverticulitis, complicated by dissemination through the portal system. However, the evolution of antibiotic therapy has relegated gastrointestinal infectious pathology to the background. Hepatobiliary pathology, especially the malignant one [4,8], is the most frequent cause of pyogenic hepatic abscess currently.

Hepatic abscess is associated with a coexisting condition in 5 to 42% of cases. Among the infectious gastrointestinal diseases related to this pathology are cholecystitis, suppurative cholangitis, pylephlebitis, peritonitis, inflammatory bowel disease, tubule-villous adenoma, colorectal carcinoma (CCR) and also previous polypectomy procedures [4]. Approximately 1 to 10% of all patients develop intra-abdominal abscess after

appendectomy. Among all the perioperative factors, the perforation state is the major risk factor for the development of postoperative abscess [6].

The case reported involves a patient with delayed presentation of pelvic hepatic abscess after a complicated appendectomy. She presented characteristic symptomatology, with prolonged daily fever in the evenings for months, abdominal pain and weight loss. Fever of undetermined origin is a common situation in pediatric clinical practice and hepatic abscess is among the differential diagnoses. In general, it occurs in conjunction with clear symptomatology, including nausea and vomits associated to the picture. The comorbidities associated with hepatic abscess described in the literature were not observed in the patient, which also made diagnosis difficult [7].

As an early diagnosis was not made, the initial source of infection of the inflamed and perforated retrocecal appendix extended to the peritoneal and subhepatic space reaching the liver. The organisms can enter this viscera through the channels or bile vessels or also directly by contiguity. The location of the hepatic segment 7, close to the retrocecal appendix, suggests that the abscess extended by contiguity.

The best strategies for treatment of pyogenic hepatic abscess in children remain controversial because of the rarity of the disease and the fact that they have been comprehended based on adult cases. However, the underlying disease and pathogenesis of the hepatic pyogenic abscess are different in these two age groups; therefore, applying the same treatment principles may not always be appropriate.

Percutaneous drainage guided by computed tomography or ultrasonography is currently the first-line treatment. It is minimally invasive, easy to perform, has few complications and should be performed as soon as the diagnosis is made. In addition, it also allows the identification of the causative organism that guides the appropriate antibiotic therapy, since the isolated blood culture does not accurately reflect the microbiology of the liver processes [8].

In the described report, the culture was positive for *Streptococcus gallolyticus*, which is group D streptococci, and is associated with the gastrointestinal tract. For the treatment of this patient, image-guided percutaneous drainage was associated with empiric antibiotic therapy, and after culture results antibiotic specific for the agent was used.

Moreover, there are surgical drainage suggestions, which consider the following parameters: multiple abscesses (depending on number, location, and size), loculated abscess, abscess with viscous content obstructing catheter drainage, underlying disease requiring

primary surgical treatment and inadequate response to percutaneous drainage in 7 days [2]. However, the patient had a single abscess of approximately 7 cm, which often contributes to therapeutic efficacy.

Conclusion

The hepatic pyogenic abscess has a sub-acute evolution, which makes diagnosis difficult, and it is of great importance to be considered in differential diagnoses in undetermined febrile conditions. The percutaneous drainage of pyogenic hepatic abscess associated with antibiotic therapy is currently a first-line procedure in the treatment of these lesions, allowing its microbiological diagnosis and treatment, and it is also safe and effective.

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