CASE REPORT

Pediatric Liver Abscess Presenting Three Years After Blunt Trauma: Diagnostic Challenge and Laparoscopy-to-Laparotomy Conversion

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ABSTRACT

Liver abscess is rare in pediatric patients, and delayed presentation following blunt abdominal trauma is unusual. Diagnosis can be challenging because symptoms are nonspecific and the interval between trauma and infection may be prolonged. A 12-year-old girl presented with one month of progressive epigastric pain, nausea, vomiting, and early satiety, without fever or jaundice. Laboratory studies showed mild leukocytosis and elevated inflammatory markers, with normal liver function tests. Ultrasonography and contrast-enhanced computed tomography revealed a large abscess in liver segment VII. Detailed history-taking identified blunt abdominal trauma three years earlier that had been managed conservatively. Broad-spectrum intravenous antibiotics were initiated, and laparoscopic drainage was attempted. Owing to a thick abscess wall and dense adhesions limiting safe evacuation, conversion to open laparotomy was required. Approximately 500 mL of fluid, including purulent material, was drained. The patient recovered uneventfully and was discharged on postoperative day seven. This case underscores delayed liver abscess as a rare post-traumatic complication and highlights the importance of thorough history-taking, imaging, and timely surgical management.
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INTRODUCTION

Liver abscess in children is a rare but potentially serious condition that may arise from hematogenous spread, biliary tract infection, or contiguous intra-abdominal sepsis (1,2). In endemic settings, *Entamoeba histolytica* remains an important differential diagnosis, although pyogenic causes predominate in many pediatric series (3,4).

Trauma-related liver abscess is uncommon, particularly following blunt abdominal injury (4). Such trauma may result in contusion, devitalized tissue, bile leak, or intrahepatic hematoma, which can persist as a sterile cavity and later become secondarily infected via hematogenous spread or gastrointestinal translocation. The latency between injury and abscess formation may range from weeks to years, complicating diagnosis (4).

Pediatric patients often lack classical features such as fever or jaundice, presenting instead with nonspecific symptoms (e.g., abdominal pain, early satiety, nausea), which may delay recognition (1,4). Imaging, particularly contrast-enhanced CT, is essential for confirming diagnosis, defining anatomical location, and guiding management (4,5). We report a rare case of delayed hepatic abscess presenting three years after blunt abdominal trauma in a child, highlighting diagnostic challenges and operative decision-making, including laparoscopy with conversion to laparotomy for effective source control.

CASE REPORT

A 12-year-old girl was admitted with progressive epigastric pain lasting one month. The pain was dull and persistent, typically worsened after meals and when lying supine. She also reported nausea, intermittent vomiting, and early satiety. There was no fever, jaundice, diarrhea, or weight loss. On presentation, she was in stable general condition with vital signs within normal limits. Abdominal examination showed mild epigastric tenderness without guarding, rebound tenderness, or other signs of peritonitis. The liver was not palpably enlarged.

Initial laboratory evaluation demonstrated mild leukocytosis of 15.3 x 103/µL (4.50-11.50 x 103/µL),

mild hypoalbuminemia of 3.57 g/dL (3.80-5.40 g/dL) and normal levels of liver function tests of AST and ALT levels of 26 U/L (10-50 U/L) and 11 U/L (10-50 U/L), respectively. Abdominal ultrasonography identified a hypoechoic lesion suspicious for a hepatic abscess. Contrast-enhanced computed tomography subsequently confirmed a well-defined hypodense lesion with peripheral enhancement in liver segment VII, consistent with a liver abscess. There was no evidence of biliary obstruction or involvement of adjacent organs.

A more detailed history clarified that the patient had experienced blunt abdominal trauma three years earlier after a fall. At that time, she did not require hospitalization or surgical intervention and remained asymptomatic thereafter. Her clinical course therefore comprised remote trauma at nine years of age, an approximately three-year symptom-free interval, and then one month of progressive upper gastrointestinal symptoms culminating in admission and definitive surgical management.

Based on clinical findings, inflammatory markers, and characteristic imaging, the working diagnosis was a liver abscess. Alternative considerations included an infected hepatic cyst, a necrotic hepatic tumor, and a subphrenic abscess; however, the radiologic features and intraoperative assessment were most consistent with a liver abscess (Figure 1).

Given the large size and posterior location of the lesion, operative drainage was planned to achieve adequate source control. Empiric broad-spectrum intravenous antibiotics were initiated preoperatively using metronidazole. A laparoscopic approach was selected initially to enable minimally invasive exploration and drainage. Intraoperatively, a thick abscess wall and dense adhesions limited visualization and hindered complete evacuation. To ensure safety and adequate drainage, the procedure was converted to an open laparotomy. Approximately 500 mL of fluid was evacuated, including 45 mL of purulent material, and a drain was placed (Figure 2,3).

Postoperatively, the patient improved gradually, with resolution of abdominal pain and normalization of inflammatory markers. Pus culture with identification and susceptibility testing (VITEK) showed no growth. Gram presumptive assessment reported scant Gram-positive

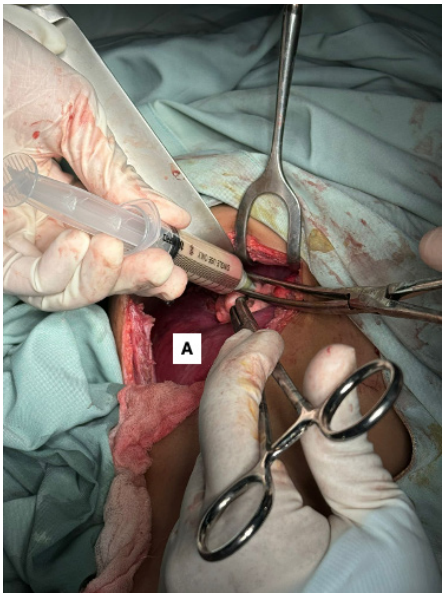

Figure 2: Liver abcess drained intraoperatively (A) Liver

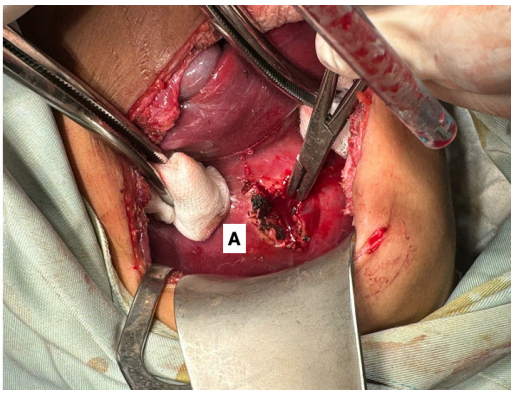

Figure 3: Widening of the incision for draining the liver abscess

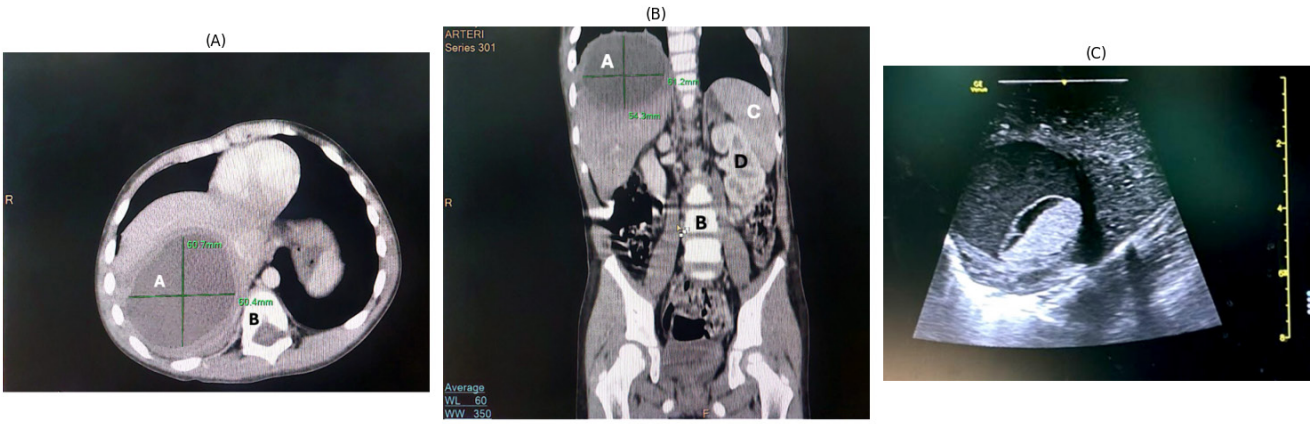

Figure 1: Radiological evaluation of liver abscess. (A) Axial contrast-enhanced CT showing a hypodense lesion (~6 cm) in segment VII. (B) Coronal CT demonstrating the extent and anatomical relationships of the lesion. (C) Ultrasound showing a hypoechoic lesion consistent with liver abscess.

cocci in clusters and scant Gram-negative solitary bacilli. During hospitalization, an endotracheal tube specimen sent for culture (VITEK) grew Streptococcus cristatus, which was reported susceptible to ampicillin, penicillin G, gentamicin, ampicillin/sulbactam, tetracycline, chloramphenicol, and cefotaxime, and resistant to ciprofloxacin and levofloxacin. Intravenous antibiotics were continued and then transitioned to oral therapy to complete the planned course. The drain was removed after output became minimal, and she was discharged in good condition on postoperative day seven. At outpatient follow-up, she remained asymptomatic with no evidence of recurrence.

DISCUSSION

This case illustrates a rare delayed liver abscess occurring three years after blunt abdominal trauma in a pediatric patient. Although pyogenic liver abscess is well recognized, a post-traumatic etiology with prolonged latency is uncommon and may be overlooked, especially in the absence of fever (1,4). The clinical course—remote trauma followed by a prolonged asymptomatic interval and subsequent progressive gastrointestinal symptoms—supports a plausible post-traumatic origin.

Blunt trauma can cause contusion, microvascular disruption, and intrahepatic hematoma. Residual hematoma or devitalized tissue may persist and evolve into a chronic cavity, which can later become infected via hematogenous spread or gastrointestinal translocation (2,4). Occult biliary micro-injury may also serve as a nidus for infection (4). These mechanisms explain delayed presentation and highlight that absence of early complications does not exclude later sequelae.

The absence of fever and jaundice illustrates a diagnostic challenge, as pediatric liver abscess may present with nonspecific gastrointestinal symptoms (1,4). Differential diagnoses include infected hepatic cyst, necrotic tumor, subphrenic abscess, and amebic abscess (3,4). Imaging is therefore essential: ultrasonography is useful initially, while contrast-enhanced CT remains the reference standard for defining abscess characteristics and guiding management (4,5). In this case, CT localized the lesion to segment VII, supporting operative drainage.

Pediatric liver abscesses are often polymicrobial, though culture-negative cases are common (4). In this patient, pus cultures were negative despite confirmed abscess. Empiric broad-spectrum antibiotics targeting Gram-negative and anaerobic organisms are recommended, with adjustment based on clinical response (2,4,5). Transition to oral therapy is guided by improvement and adequate source control.

Definitive management requires timely source control combined with antibiotics (4,5). Drainage options include percutaneous, laparoscopic, and open approaches. While minimally invasive techniques reduce morbidity, their success depends on abscess characteristics and location (5). In this case, laparoscopy was attempted but limited by a thick wall and dense adhesions, necessitating conversion to open laparotomy. This should be regarded as a safety measure to ensure complete drainage and reduce recurrence risk. The favorable outcome supports the effectiveness of this approach.

Delayed post-traumatic liver abscess is rare in pediatric patients and typically presents within months rather than years (4). This case is notable for its prolonged latency and highlights a pragmatic approach: initial minimally invasive drainage with a low threshold for conversion. Clinicians should consider remote trauma in children with persistent upper abdominal symptoms. CT is essential for diagnosis and planning, and prompt conversion to open surgery is appropriate when minimally invasive drainage is insufficient (1,4,5).

CONCLUSION

Delayed liver abscess is a rare but important complication of blunt abdominal trauma in children. Thorough history taking, high clinical suspicion, and appropriate imaging are essential for diagnosis. Laparoscopic drainage is effective, and conversion to open surgery ensures safety when necessary. Early recognition and management result in favorable outcomes.

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