Case Report

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Spontaneous Hepatic Artery Dissection Presenting with Common Symptoms: A Diagnostic Challenge

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Abstract

Spontaneous hepatic artery dissection is an extremely rare subtype of isolated visceral artery dissection (IVAD) and often presents with nonspecific abdominal pain, complicating early diagnosis. Prompt recognition is essential, as delayed intervention may result in life-threatening complications including ischemia or rupture. A 44-year-old man with no significant medical history presented with postprandial right upper quadrant pain radiating to the back. Initial examination and laboratory tests, including ultrasound, were inconclusive. Given persistent clinical suspicion, computed tomography angiography revealed a long-segment hepatic artery dissection with near-complete luminal narrowing and intraluminal thrombus. Liver perfusion was preserved, with no biochemical or radiological signs of ischemia. After multidisciplinary consultation, conservative management with anticoagulation and serial Doppler ultrasonography was initiated. The patient remained clinically stable without complications. This case highlights the diagnostic challenges of hepatic artery dissection and underscores the importance of maintaining clinical suspicion in unexplained abdominal pain. In stable patients without organ ischemia, conservative treatment with close imaging follow-up can be a safe and effective management strategy. Due to its rarity, standardized treatment guidelines for hepatic artery dissection remain undefined.

Keywords: Anticoagulants, computed tomography, hepatic artery, dissection, visceral artery dissection

Introduction

Approximately 5% to 10% of emergency department visits are attributed to abdominal pain. While this symptom may result from benign and self-limiting conditions, it can also be a manifestation of life-threatening pathologies that require urgent intervention. One of the rarer causes of abdominal pain is isolated visceral artery dissection (IVAD). These dissections are most commonly observed in the celiac artery, superior mesenteric artery, inferior mesenteric artery, and their branches (1). In patients presenting with abdominal pain, IVAD is often diagnosed incidentally through advanced radiological imaging, typically performed based on the clinician's level of suspicion. Indeed, several studies have shown that with the increased use of abdominal computed tomography, spontaneous IVADs are now diagnosed more frequently, including cases that may have previously gone undetected (2).

Current knowledge regarding the pathogenesis of isolated visceral artery dissection (IVAD) remains limited, and there is no established consensus on optimal treatment strategies. Given that most cases present with mild or nonspecific symptoms, conservative management is often favored as the initial approach (3). However, some researchers argue that conservative treatment may carry the risk of delayed complications, such as aneurysm formation or progression of the dissection, potentially resulting in missed opportunities for timely intervention (4). Early complications of IVAD may include dissection rupture, organ ischemia, and tissue necrosis, while the most serious late complication is the rupture of a dissecting aneurysm, which can lead to life-threatening outcomes (5).

The aim of presenting this case is to highlight that, although more common visceral artery pathologies such as celiac or mesenteric artery dissection and thrombosis are typically considered first in patients presenting to the emergency department with acute abdominal pain, dissection and thrombosis of the hepatic artery—an exceptionally rare localization—should not be overlooked in the differential diagnosis. As demonstrated in this case, with appropriate clinical suspicion and timely imaging, this uncommon yet potentially serious condition can be accurately identified and managed before critical complications arise.

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Case Report

A 44-year-old male patient with no known systemic illness presented to the emergency department with a two-day history of intermittent and progressively worsening abdominal pain. He described the pain as a continuous, squeezing sensation localized to the right side of the abdomen, radiating to the back. The patient also noted that the intensity of the pain increased following meals. His medical history included a 20-year history of smoking approximately one pack of cigarettes per day. On initial evaluation in the emergency department, his vital signs were stable (blood pressure: 120/70 mmHg, heart rate: 86 bpm, respiratory rate: 18 breaths/min, body temperature: 36.5°C). Abdominal examination revealed marked tenderness in the right upper quadrant, but no guarding or rebound tenderness was observed. No pathological findings were detected on systemic examination. These physical findings suggested a visceral origin of the abdominal pain.

At the time of presentation to the emergency department, the patient's complete blood count revealed borderline leukocytosis (WBC: 13.23 × 10^3/μL). Aside from this finding, no abnormalities were noted in other hematological parameters or in the extended biochemical panel. The electrocardiogram (ECG) showed normal sinus rhythm, with no evidence of ischemia. Following the clinical evaluation, a bedside abdominal ultrasound was performed. No acute pathology was observed in the intra-abdominal solid organs or adjacent structures, and the appendix appeared normal in thickness and surrounding tissue. Given the elevated leukocyte count, particular attention was paid to evaluating the appendix for possible retrocecal appendicitis; however, no significant findings were noted to support this diagnosis. As the visceral nature of the abdominal pain persisted and its postprandial exacerbation raised suspicion for mesenteric angina, a contrast-enhanced computed tomography angiography (CTA) of the abdomen was planned to assess the abdominal aorta and its branches.

Abdominal computed tomography angiography demonstrated a dissection flap extending along the hepatic artery (Figure-1). The dissection originated from the proximal segment and was characterized by an intraluminal thrombus spanning a long segment, leading to near-complete luminal narrowing. Additionally, small thrombi were observed in the proximal splenic artery, although these did not significantly compromise the vessel diameter. Perfusion of the liver with the true lumen was preserved, and no radiological signs of ischemic damage were detected in the hepatic parenchyma. These findings were consistent with the patient's liver function tests, which remained within normal limits.

Following imaging, anticoagulant therapy was initiated with 60 mg of low-molecular-weight heparin administered intravenously, and intravenous isotonic fluid was given for hydration. A multidisciplinary bedside evaluation involving cardiovascular surgery, gastroenterology, general surgery, and interventional radiology concluded that the patient should initially be managed medically, with serial follow-up of the hepatic artery via Doppler ultrasonography. The interventional radiology team considered the proposed procedure to be high-risk due to the vascular anatomy and the length of the dissection segment. Accordingly, Doppler ultrasound follow-ups were scheduled weekly at first, with

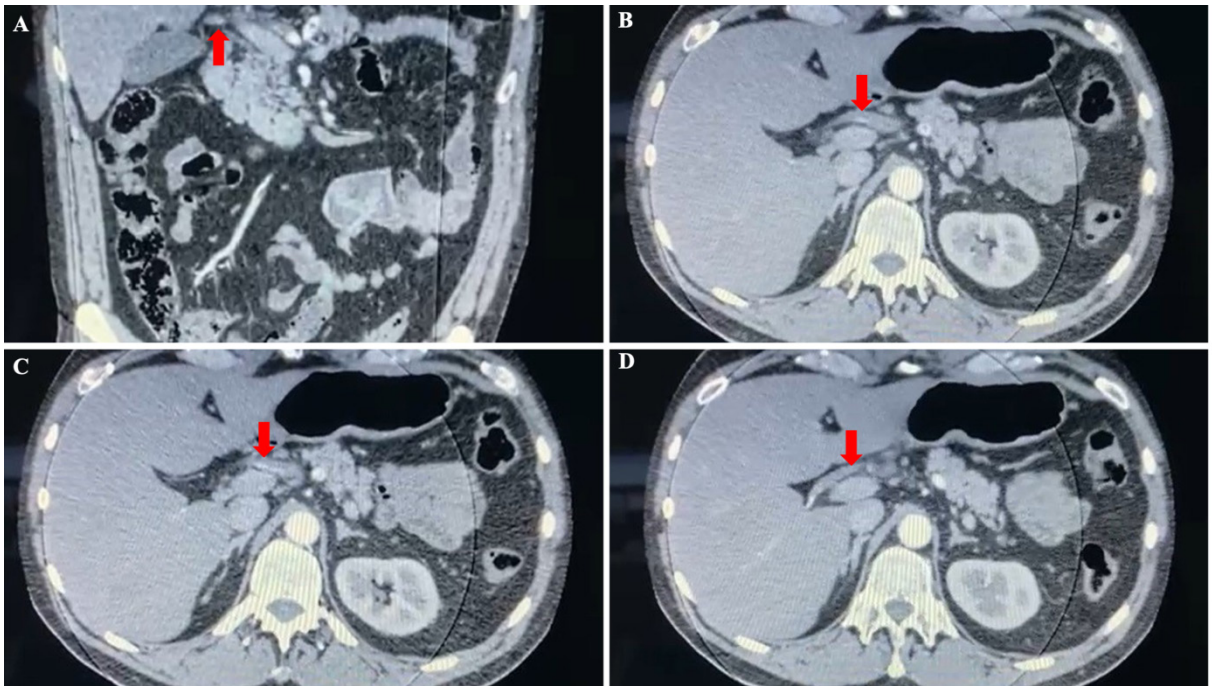

Figure 1. Imaging findings of hepatic artery dissection on abdominal CT angiography. The dissected segments are indicated by red arrows (A: Coronal view; B, C, D: Axial views).

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gradually extended intervals based on clinical stability.

Pain control was successfully achieved. A treatment plan was established by general surgery, cardiovascular surgery, and gastroenterology teams involving subcutaneous administration of low-molecular-weight heparin at a dose of 60 mg twice daily. Additionally, the patient was provided with guidance on an appropriate diet and nutritional regimen.

Written informed consent was obtained from the patient for the anonymized use of clinical data and radiological images in this case report. This case report was prepared in accordance with the principles of the Declaration of Helsinki.

Discussion

Visceral artery dissections (IVADs) are rare vascular pathologies that can occur in isolation, without any association with aortic dissection. They most commonly involve the superior mesenteric artery, the celiac artery, and their major branches. Hepatic artery dissection represents one of the rarest forms of IVAD and has been described in the literature through only a limited number of case reports (6). Etiologic factors implicated in IVAD include hypertension, smoking, vasculitis, trauma, and structural abnormalities of the arterial wall (1, 6, 7). In the present case, the only identifiable risk factor was a long-standing history of cigarette smoking.

In reported cases of hepatic artery dissection, 71% have been documented to present with visceral abdominal pain localized to the right upper quadrant (7). The underlying mechanism of pain is thought to involve luminal narrowing and vascular tension caused by the dissection process itself. Although the clinical presentation often resembles mesenteric ischemia, the diagnosis is most frequently made incidentally through advanced imaging modalities such as computed tomography (2). In the present case, no pathology was identified on initial investigations; however, due to persistent clinical suspicion, CT angiography was performed, which confirmed the diagnosis of hepatic artery dissection. The clinical importance of this rare vascular condition lies in its potential to progress to rupture or organ ischemia, with fatal outcomes reported in up to 44% of cases (7). This case illustrates a rare presentation of hepatic artery dissection that was not identified on initial evaluation but was diagnosed through advanced imaging. It highlights the fact that the diagnosis of visceral artery dissections often depends on high clinical suspicion guiding the use of appropriate imaging techniques.

Several case reports in the literature have demonstrated that hepatic artery dissection can be successfully managed with medical therapy and radiological follow-up alone. Dong et al. (8) emphasized that, in patients without signs of peritoneal irritation, a short course of anticoagulant therapy may be sufficient. Treatment strategies in such cases should be tailored to the patient's clinical presentation and accompanied by continued radiological monitoring using ultrasonography. In addition, endovascular embolization has been proposed as a potential alternative in patients at high surgical risk. In such instances, careful assessment of the liver's collateral perfusion capacity is considered essential (9).

Thrombus formation within the true lumen may lead to compromised hepatic perfusion and subsequent ischemic injury, which can necessitate urgent intervention. When such complications are present or carry a high risk of developing, surgical management should be prioritized. Nevertheless, due to the limited number of hepatic artery dissection cases reported in the literature, there is still a lack of standardized guidelines regarding optimal patient management (10).

In the present case, the dissection involved the hepatic artery along a long segment, which was deemed technically high-risk for intervention by the interventional radiology team. Moreover, no radiological or biochemical evidence suggestive of hepatic ischemia was identified. Based on a multidisciplinary bedside evaluation, conservative management combined with regular follow-up using Doppler ultrasonography was considered a safe and appropriate approach.

Conclusion

Hepatic artery dissection is a rare form of isolated visceral artery dissection, typically presenting with nonspecific abdominal pain and often requiring advanced imaging for diagnosis. Maintaining clinical suspicion and conducting appropriate radiological evaluations are critical for timely diagnosis and the prevention of potentially severe complications. In cases where the patient is hemodynamically stable and organ perfusion is preserved, conservative management combined with close radiological monitoring under a multidisciplinary approach represents a safe and effective treatment strategy.

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