

Case report

An unusual localization of massive portasystemic collaterals: CT angiographic demonstration

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Abstract. This article presents a patient with portal hypertension in whom an unusual localization for portosystemic collaterals have incidentally been found. Upper abdominal sonography revealed tubular structures filling the whole perirenal and partially the perihepatic area, and their venous nature was demonstrated with duplex Doppler sonography. Spiral CT angiography identified the right-sided retroperitoneal location and mesenteric–lumbar route of the collaterals. Upper gastrointestinal endoscopy with antral biopsy and percutaneous liver biopsy were performed. Laboratory results and specimen evaluation revealed chronic active hepatitis due to hepatitis-B infection. Attention is drawn to the abnormal location of these vessels, together with the noninvasive nature and competence of CT angiography in demonstrating vascular pathologies.

Key words: Portal hypertension – Varices – Retroperitoneal

Introduction

Portosystemic collaterals developing as a consequence of portal hypertension present most commonly as esophagogastric varices, hemorrhoids, and less commonly, as splenorenal, umbilical, gallbladder fossa or retroperitoneal varices. We herein present a case with unusual right-sided mesenteric–lumbar collaterals, draining into both the inferior vena cava and the azygos system, and extending into extra-abdominal muscles.

Case report

A 34-year-old male patient presented with epigastric pain of 3-year duration which was unresponsive to medical therapy. He had mild depression and slurred speech. He was referred to our clinic for an upper abdominal sonographic evaluation.

Sonography revealed marked splenomegaly with normal splenic and portal vein diameters. At the portal confluence, an aberrant vascular structure was noted. This structure surrounded the right kidney and extended down to the iliac crest. Color-Doppler sonography demonstrated venous flow in these vessels (Fig. 1) and also hepatofugal blood flow in the portal vein.

Liver function tests were abnormal, indicating chronic liver disease, with hepatitis-B surface antigen positive and core antigen negative.

Upper gastrointestinal endoscopy showed grade-I gastroesophageal varices of three columns and antral mucosal biopsy positive for *Helicobacter pylori*.

A CT angiography revealed esophageal collaterals, marked splenomegaly, and pericholecystic inflammatory reaction without an increase in gallbladder wall thickness. The left liver lobe was almost nonexistent, either due to agenesis or to cirrhotic atrophy. Serpiginous vessels previously identified during sonography were demonstrated to originate from the superior mesenteric vein proximal to the portal confluence (Fig. 2) and form an extensive vascular bundle within the right anterior pararenal space. This vascular structure drained through two major vessels: One of them followed the posterior abdominal wall at the level of T12-L1, entered the paravertebral muscles (iliocostalis lumborum and longissimus dorsi), within the muscle, and further branched into two vessels, both of which joined the ascending lumbar vein through the first and the third lumbar veins (Fig. 3). At the level of L5-S1, the second major vessel followed the same route, passing anterior to the iliacus and posterior to and through the psoas muscles, and joined the right common iliac vein through the fifth lumbar vein. The ascending lumbar vein on the right side

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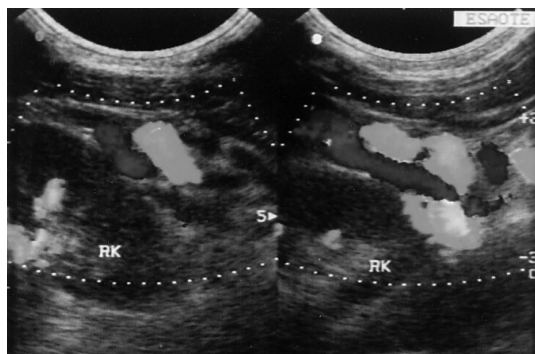


Fig. 1. Color-Doppler images show vascular structures between the lower pole of the right kidney and the abdominal wall



Fig. 2. Maximum intensity projection reconstruction of CT scans demonstrates branching of the collateral from the superior mesenteric vein (arrow)

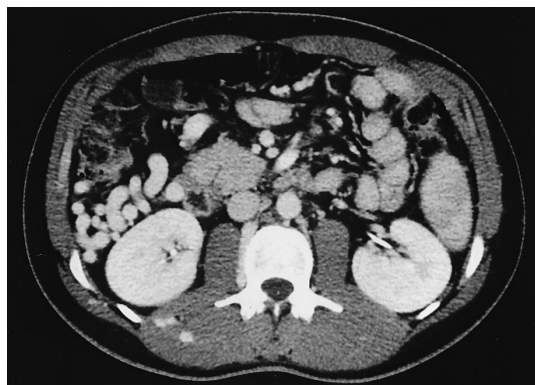


Fig. 3. Axial scans show anatomical relationships of the collateral bundle (arrowhead), extension to the posterior abdominal muscles (arrow), and the connection between the third lumbar vein and the ascending lumbar vein (thin arrow)

was clearly more prominent. Multiplanar reconstructions demonstrated the extent of the collateral and its communication with the ascending lumbar vein.

Taking care not to puncture the collaterals, percutaneous tru-cut liver biopsy was performed to assess parenchymal damage, which revealed chronic active hepa-

titis with piecemeal and bridging necroses of the portal areas.

Discussion

Portosystemic collaterals develop as a compensation for the normally large portal blood flow that cannot be maintained due to elevated intrahepatic venous pressure in portal hypertension. The most common routes for collateral circulation are through the coronary–gastroesophageal–azygos system, inferior mesenteric–hemorrhoidal system, and retroperitoneal mesenteric–lumbar vein system [1, 2]. Recanalization of embryonic vessels, such as the umbilical vein, gastrosplenic, and retroperitoneal veins, also provide shunting of blood [1]. Retroperitoneal collaterals develop through veins from the liver to the diaphragm, veins in the spleno-renal ligament and omentum, lumbar veins, and veins developing in the scars of previous laparotomies [3].

The patient presented herein is a biopsy-proven case of portal hypertension due to chronic active B hepatitis; thus, the single large vessel connecting the superior mesenteric vein to the azygos system and inferior vena cava is regarded as a spontaneous portosystemic collateral. The massive shunting provided by the single large vessel unusually occupies the right retroperitoneal space. Another unusual feature is the extension of the vessel into the posterior abdominal muscles. Such an extension carries the risk of heavy bleeding following traumas, especially surgical interventions.

Besides several invasive methods, such as splenoportography, color-Doppler sonography, and CT, can also be utilized in demonstrating collaterals and portal perfusion, thus providing indirect evidence of portal hypertension. We preferred to use CT angiography in this patient, considering the relative noninvasive nature of the procedure, automated contrast injection, and short scanning times providing homogeneous opacification of vascular structures with adequate demonstration of anatomical relationships [4, 5].

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