Anteriorly Placed Splenic Vein: a Case Report

Hira Lal · Deb K. Boruah · Ankusha Yadav ·
Amrita Samal

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Abstract Splenic vein located anterior to pancreas is a rare congenital anomaly. To date, only one case has been reported in literature. A thorough knowledge of the normal anatomy, most frequent variations, and congenital and acquired anomalies of the spleno-portal axis is of great importance for hepatobiliary and pancreatic surgeons. It is therefore essential for preoperative evaluation of the anatomical details of the spleno-portal venous axis to be made by imaging. We report such a case of anteriorly placed splenic vein in a 40-year-old female prospective renal donor. To the best of our knowledge, this represents the second reported case of an anteriorly placed splenic vein.

Keywords Splenic vein (SV) · Superior mesenteric vein (SMV) · Computed tomography (CT) · Omental bursa · Malrotation

Introduction

Normally, the splenic vein lies immediately posterior to the pancreas and follows a straight course (unlike the tortuous splenic artery) to the hilum of the spleen. The body and tail of the pancreas are seen anterior to the splenic vein.

A thorough knowledge of the normal anatomy, most frequent variations, and congenital and acquired anomalies of the splenic vein is of great importance for surgeons that can be

explained on the basis of defect in the development of omental bursa, with malrotation of the pancreatic body and tail.

Case Report

A 40-year-old female was referred for CT angiogram as a prospective voluntary kidney donor for her husband. Patient was asymptomatic. CT angiogram was done on a 64-slice MDCT scanner (Brilliance 64 CT, Philips Medical Systems, the Netherlands), which revealed anomalous course of the splenic vein (SV) running along anterior aspect of the pancreas (Fig. 1). Narrower caliber of intra-pancreatic course of the splenic vein was noted in the pancreatic neck region. The superior mesenteric vein was identified behind the head of the pancreas and its communication with the SV to form the main portal vein was demonstrated (Fig. 2). The diameter of the splenic vein measures 9.6 mm. No filling defect or abnormal dilatation of the splenic vein or splenic hilar varices was noted. Mild thinning of pancreatic parenchyma was noted in

Fig. 1 Axial post contrast CT scan of the abdomen shows anteriorly placed splenic vein along the anterior aspect of the pancreas (arrow) extending from the splenic hilum to the pancreatic neck

H. Lal (✉) · A. Yadav · A. Samal
Department of Radiology, Sanjay Gandhi Post Graduate Institute and
Medical Sciences, Raebareli Road, Lucknow 226014, India
e-mail: hiralal2007@yahoo.co.in

D. K. Boruah
Department of Radio-diagnosis, Assam Medical College and
Hospital, Dibrugarh, Assam, India

Fig. 2 Axial post contrast CT scan of the abdomen showed intra-pancreatic course of anteriorly placed splenic vein (*thick arrow*) in the pancreatic neck region with mild thinning of pancreatic parenchymal tissue. Narrower caliber of intra-pancreatic splenic vein was also noted. The SMV was noted behind the head of the pancreas where it communicated with the SV to form the main portal vein (*thin arrow*)

the neck of the pancreas (Figs. 1 and 2). Otherwise, pancreatic parenchyma appears normal. The splenic artery is normal. No anomalous variation was noted in the celiac axis. A confident diagnosis of anteriorly placed splenic vein was made.

Discussion

The splenic vein is formed at the splenic hilum by the joining of three to six splenic tributaries and the left gastroepiploic vein [1]. The portal vein is formed behind the neck of the pancreas by the union of the splenic vein and the superior mesenteric vein [1, 2].

In a majority of cases, the splenic vein lies in a distinct horizontal groove on the posterior surface of the pancreas; rarely, the groove is completely concealed by the overhanging pancreatic tissue. The splenic artery accompanies the splenic vein. In 54 % of cases, it is located anterior to the splenic vein; and in just 2 % of cases, it is posterior to the vein [3].

The splenic vein, which was placed anterior to the neck and body of the pancreas, can be explained on the basis of defect in the development of the omental bursa, with rotation of the pancreatic body and tail. During the seventh and eighth embryonic week, the dorsal mesentery of the stomach (mesogastrium) bulges rapidly to the left and caudally, forming the sac of the omental bursa, whereas the ventral mesentery develops slowly. Such changes in peritoneal development lead to rotation of the stomach on its longitudinal axis by 90°, rendering the original right and left aspects of the stomach as the posterior and anterior surfaces, respectively.

The body and tail of the pancreas also seem to move to the left and rotate on their long axis by 90° [4]. Thus, the original right surface of the pancreatic body and tail represent their anterior surface after the completion of the omental bursa. The capsule covering the anterior surface and the pancreatic head derives from the left side of the embryonic mesentery of the duodenum. Contrary to the prevailing notion, therefore, the surface of the human pancreas has an abrupt 180° shift at the neck, from the viewpoint of the primitive common dorsal mesentery [5]. Even the adult pancreas retains the vestige of this ontogenetic twist at the neck [6].

In our case, the ontogenetic twist was noted in the form of thinning of pancreatic parenchymal tissue in the neck of the pancreas where the anteriorly placed splenic vein had intra-pancreatic course (Figs. 1–2).

Conclusion

The anatomical course of the porto-splenic axis is variable but readily identifiable using standard imaging techniques like color Doppler ultrasonography, computed tomography, and magnetic resonance imaging. Preoperative assessment of anatomical detail of porto-splenic axis is necessary for shunt surgeries in portal hypertension, pancreaticoduodenectomy, and other pancreatic surgeries.

Conflict of Interest Dr. Hira Lal, Dr. Deb K. Boruah, Dr. Ankusha Yadav, and Dr. Amrita Samal declare that they have no conflict of interest.

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