Unusual jejunal tributaries of the splenic vein and their surgical importance: a case report

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Abstract

Introduction
Knowledge of variations regarding the formation, termination and tributaries of the portal vein, superior mesenteric vein and splenic vein are very useful and of utmost importance for surgeons performing surgeries of the pancreas and duodenum. Normally, the jejunal veins are the tributaries of the superior mesenteric vein. We report here, a very unusual case where two proximal jejunal veins drained into the splenic vein instead of the superior mesenteric vein.

Case report
During the dissection classes for undergraduate medical students, we noted variations in the termination of the upper jejunal veins in an adult male cadaver who was approximately 65 years old. We found that the union of three veins formed the portal vein: the splenic vein, jejunal veins and the superior mesenteric vein.

Conclusion
Familiarity with such anatomical variation provides useful information for surgeons performing abdominal surgical procedures.

Introduction
The superior mesenteric vein and its tributaries are subject to more variation than the arterial system. Therefore, the surgeons performing pancreateoduodenectomy should be familiar with the important venous landmarks and portal venous tributaries.

The superior mesenteric vein drains the small intestine, caecum and ascending and transverse parts of the colon. It ascends in the mesentery on the right of the superior mesenteric artery. The splenic vein is formed at the hilum of the spleen and runs a straight course behind the pancreas. Finally, the superior mesenteric vein joins with the splenic vein behind the neck of the pancreas to form the portal vein.

The first order tributaries of the superior mesenteric vein are the ileal and the jejunal tributaries. The jejunal tributary usually runs behind the superior mesenteric artery as it drains the proximal jejunum and then enters the postero medial aspect of the ileal tributary to form the main trunk of the superior mesenteric vein. These jejunal veins may pose unique technical challenges for surgeons performing pancreateoduodenectomy. We present here a very unique course and termination pattern of two proximal jejunal veins and discuss their clinical implications.

Case report
During the dissection classes for undergraduate medical students, we noted variations in the termination of the upper jejunal veins in an adult male cadaver who was approximately 65 years old. The portal vein was formed behind the neck of the pancreas by the union of the splenic and superior mesenteric veins (Figures 1 and 2). The splenic vein received its normal tributaries from the spleen, pancreas and stomach. Apart from that, it also received two large jejunal tributaries. The upper jejunal vein was small and

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Figure 1: Dissection of the upper abdominal vessels. The pancreas and stomach have been retracted upwards. Note the termination of the two jejunal veins (JV) into the terminal part of the splenic vein (SV). The superior mesenteric vein (SMV), superior mesenteric artery (SMA), portal vein (PV) and jejunum (JEJ) can be seen in the figure.

Figure 2: Closer view of the formation of the portal vein (PV) by the superior mesenteric (SMV) and splenic (SV) veins. The pancreas has been pushed upwards. Note the termination of the two jejunal veins (JV) into the terminal part of the splenic vein. The superior mesenteric artery (SMA) can be seen in the figure.
terminated into the splenic vein 1 cm away from the formation of the portal vein, whereas the lower jejunal vein was large and it terminated into the splenic vein 5 mm away from the formation of the portal vein. This gave the appearance that the union of three veins formed the portal vein: the splenic vein, jejunal veins and the superior mesenteric vein (Figure 2). Both the jejunal veins passed anterior to the superior mesenteric artery and ran upwards behind the body of the pancreas, crossing its lower border. Since two jejunal veins drained into the splenic vein, the superior mesenteric vein was reduced in size.

Discussion
Pancreatoduodenectomy, the treatment of pancreatic cancer, offers many technical challenges. The variability in the mesenteric veins poses a challenge for surgeons during pancreatoduodenectomy, especially in cases with borderline resectable pancreatic cancer. During pancreatic resections with venous reconstruction, the superior mesenteric vein and its tributaries must be carefully ligated. The complexity of these procedures further highlights the importance of extensive pre-operative knowledge of the mesenteric venous anatomy.

Normally, the jejunal veins travel posterior (dorsal) to the superior mesenteric artery, but they may also course anterior (ventral) to the artery which is seen in up to 20% of cases. In our case, we also observed that the jejunal veins ran anterior to the artery. The knowledge of this variant anatomy is very important for performance of pancreatoduodenectomy, specifically with respect to mobilisation of the superior mesenteric vein for identification of the superior mesenteric artery. Thus, to safely perform a mesenteric approach to the artery, the surgeon should be pre-operatively aware of the paths of the superior mesenteric vein tributaries and their variations.

Hyoun et al.5 reported a case where the first jejunal vein directly drained into the splenoportal confluence. They also report a case wherein the inferior mesenteric vein drained into the first jejunal branch in 4% of patients and believe that such a type of variation may be a congenital anatomic variation rather than a collateral route. Graf et al.,7 in their study, reported that the first jejunal vein drained into the left intestinal branch of the superior mesenteric vein in 19 of 54 patients. In a study conducted by Pavlos et al.,4 5.3% of cases did not have a common trunk of the superior mesenteric vein with both the ileal and jejunal veins draining together into the splenoportal confluence. Gorantla et al.8 reported a case where the portal vein was formed by the union of the splenic vein, superior mesenteric vein and inferior mesenteric vein. To the best of our knowledge, there have been no studies in the past that exhibit such a type of anatomical variation where the jejunal veins, superior mesenteric vein and splenic vein are joined to form the portal vein. Thus, such a variation is very unique and significant. Knowledge of such variations in portal anatomy is important in the pre-operative work-up prior to liver transplantation or resection.

Conclusion
The anatomical course of the jejunal veins is highly variable but readily identifiable using standard computed tomography imaging. Hence, this should aid the surgeons in planning for pancreatoduodenectomy with or without venous reconstruction. Detailed knowledge of the vascular anatomy of the root of the mesentery is necessary for performance of complex surgical procedures that involve the pancreas and lymph node metastases from midgut carcinoid tumours. Adequate pre-operative preparation and awareness of the probable arterial and venous anatomical variations would help surgeons to perform the complex pancreatic resection with greater safety.

Consent
Written informed consent was obtained from the patient for publication of this case report and accompanying images. A copy of the written consent is available for review by the Editor-in-Chief of this journal.

References

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