Unusual origin of left colic artery from the superior mesenteric artery and its course across the left kidney
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Abstract
Knowledge of variations of visceral arteries of the abdomen is important for a successful approach of invasive procedures. Unusual origin of the colic branches of the inferior mesenteric artery is rarely reported in the literature. This paper reports a case of an unusual origin of the left colic artery from the superior mesenteric artery and its course across the left kidney.

Introduction
The left colic artery (LCA) is the first branch of the inferior mesenteric artery. It runs behind the peritoneum, upwards and laterally to reach the margin of the colon. Here, it divides into ascending and descending branches. The ascending branch anastomoses with the left branch of the middle colic artery whereas the descending branch anastomoses with the ascending branch of the first sigmoidal artery. LCA supplies the left one third of the transverse colon and upper part of the descending colon¹.

LCA may show variation in its origin and course. Rarely, it may arise from the superior mesenteric artery²,³,⁴ or celiacomesenteric artery⁵.

Frequently, LCA and sigmoid arteries may arise as a common trunk from the inferior mesenteric artery⁶. Knowledge of the anatomical variations of the colic branches of the mesenteric arteries is clinically important during laparoscopic surgeries of the abdomen. Herein we report a case of abnormal origin of LCA from superior mesenteric artery.

Case report
During dissection classes for medical undergraduates, we observed an unusual origin and course of the left colic artery. It was observed in an adult male cadaver from South Indian origin. It took its origin from the right side of the superior mesenteric artery, proximal to the origin of the middle colic artery. It coursed in front of the uncinate process of the pancreas and coursed to the left by crossing superficial to the superior mesenteric artery from right to left. It then crossed the suspensory ligament of the duodenum, just above the duodeno-jejunal flexure and passed superficial to the left kidney.

Upon reaching the lateral border of the left kidney, it divided into ascending and descending branches. The ascending branch anastomosed with the middle colic artery and the descending branch anastomosed with the first sigmoidal branch of the inferior mesenteric artery. The inferior mesenteric artery gave sigmoidal branches and continued into the pelvis as superior rectal artery (Figure 1 and Figure 2).

Discussion
In the present case, the LCA had an unusual origin from the superior mesenteric artery, proximal to the origin of the middle colic artery. There are reports on the unusual origin of LCA. Rusu et al. have reported a case of accessory LCA arising from the superior mesenteric artery, close to the lower border of the pancreas². Kim et al. have reported the superior mesenteric artery giving a branch to the descending colon, and they named the branch as accessory LCA³. Earlier Badagabettu et al. reported a case, where LCA arose from the superior mesenteric artery⁴. In that case, the left branch of the LCA presented a vulnerable course along the inferior border of the pancreas. Katagiri et al. have reported the origin of LCA from the celiacomesenteric trunk⁵. Jiji et al. have observed the LCA forming anastomosis with the dorsal pancreatic artery⁶.

In the current case LCA took origin from the right side of the superior mesenteric artery, crossed superficial to it from right to left, and coursed anterior to the left kidney before reaching the wall of the colon. Contrary to classical anatomy text books, Niculescu et al. have described that the inferior mesenteric artery gives the superior left colic artery, middle left colic artery and inferior left colic artery (trunk of sigmoid arteries)⁷. Only in one case they observed the superior left colic artery arising from the superior mesenteric artery⁴.

Morphological variations of the colic branches of the mesenteric arteries are clinically important during the surgeries of colorectal cancer. Vascular transection of the specific branch of the inferior mesenteric artery is the crucial

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step in these surgeries. Though anastomosis exists between the colic branches, functionally such as anastomosis is questionable. So it is important to understand that each colic branch supplies the definite territory of the colon. Knowledge of the unusual origin of LCA from the superior mesenteric artery can be useful in the planning of surgeries in the territories of the inferior mesenteric artery. Though aneurysm is not common in visceral arteries rarely is LCA reported to present ruptured aneurysm. Transcatheter arterial embolization is preferred to treat aneurysm of LCA. Variations of the LCA origin should be kept in mind while performing such procedures. Unusual course of LCA in relation to the left kidney observed in the current case is surgically important during nephropexy and nephrectomy procedures.

Irrigation of the colon by the specific colic branches of the mesenteric arteries can be explained based on the embryonic development. The superior mesenteric artery supplies the territories derived from the mid gut. Similarly, hind gut derivatives are supplied by the inferior mesenteric arteries. Abnormal irrigation of the descending colon and left part of the transverse colon by the branch of the superior mesenteric artery observed in the present case could be due to the development of the middle embryonic intestine.

Conclusion

Though the origin of LCA from the superior mesenteric artery has been reported earlier, its origin from the right side of the superior mesenteric artery, arching course to the left and running anterior to the kidney makes this case unique from the previously published cases. The arching part of the artery across the superior mesenteric artery can be compressed by the loaded jejunum. This might change the angle between the superior mesenteric artery and LCA in the current case, resulting in decreased blood flow in the LCA. Its course and relations also make it prone for injury in pancreatic and renal surgeries.

References


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