

A rare case of distal one-third of the transverse colon supplied by a branch from splenic artery

Belgin Bamac, PhD, Tuncay Colak, PhD, Aydın Ozbek, MD, Baris Ozturk, MD.

ABSTRACT

We observed a rare variation of splenic artery during the routine dissection in the Laboratory of the Anatomy Department. It arose from the splenic artery toward the distal part of transverse colon which typically supplied by the inferior mesenteric artery. Embryologically distal part of the transverse colon is a segment of hindgut. In this case, splenic artery which an artery of foregut supplies an area of hindgut. The knowledge of splenic artery variations has significant importance during surgery of the organs of the upper abdominal region. In this study, we discussed clinical significance and embryological aspects of this anomalous artery.

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The splenic artery is the largest branch of the coeliac axis.¹ It runs to the left in a way course along the upper border of the pancreas and behind the stomach. On reaching the left kidney, the artery enters the lienorenal ligament and runs to the hilum of the spleen.² Nearing the spleen it divides into 5 or more segmental branches which enter its hilum.¹ There are pancreatic, short gastric and omental branches as well as the left gastroepiploic artery, which commonly arises from the ventral surface of the splenic artery.³ Knowledge of the variation of the branching patterns of the splenic artery is important for the surgeons, radiologist and other clinicians in planning surgical procedure. The literature contains many variational course and branching patterns of the splenic artery;⁴⁻⁹ however, reports on the branch of the artery to the colon are rare.^{10,11} The aim of this study was to describe a case of distal transverse colon supplied by a branch from splenic artery.

Case Report. In a 78-year-old, Turkish male cadaver, a variation of a branch of the splenic

artery was observed during the routine dissection in the Laboratory of Anatomy Department of Medical Faculty of Kocaeli University. Along the course of the splenic artery, an artery was given off from distal segment of the splenic artery. It ran inferiorly in front of cauda of pancreas and renal vein to the area of the distal transverse colon (**Figures 1 & 2**). This artery was accompanied by the inferior mesenteric vein. The splenic artery continued to the hilum of the spleen after giving this branch.

Discussion. Surgery of the organs of the supracolic part of the abdomen requires a thorough knowledge of the vascular anatomy of this region. It is important to know the existing aberrations in planning surgical procedure. The vascular anomalies are resulting from the aberration in the embryological development.⁴ The vitelline arteries, initially some paired vessels supplying the yolk sac, gradually fuse and form the arteries located in the dorsal mesentery of the gut. In the adult, they are represented by the coeliac, superior mesenteric and inferior mesenteric

From the Department of Anatomy, School of Medicine, Kocaeli University, Kocaeli, Turkey.

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Address correspondence and reprint request to: Dr. Tuncay Colak, Department of Anatomy, School of Medicine, Kocaeli University, Kocaeli, Turkey. Tel. +902 623037251. Fax. +902 (262) 3222140. E-mail : bbamac@hotmail.com



Figure 1 - Photographic representation of the variation. P - pancreas, S - spleen, SA - splenic artery, IMV - inferior mesenteric vein, SV - splenic vein, TR.C - transverse colon, * the anomalous branch of the splenic artery.

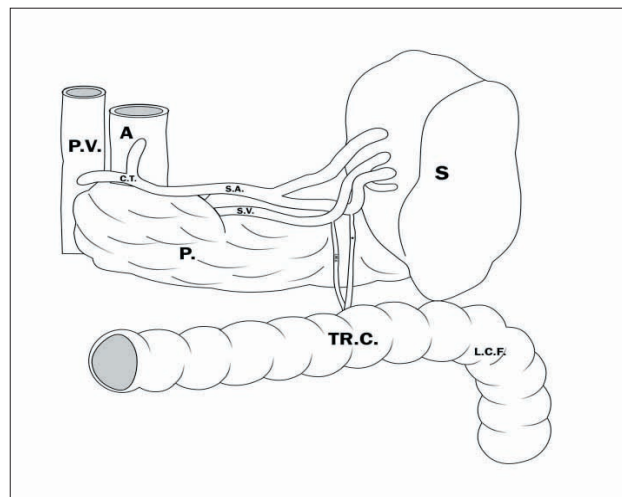


Figure 2 - Schematic diagram of the variation. P - pancreas, S - spleen, A - aorta, CT - coeliac trunk, PV - portal vein, SA - splenic artery, SV - splenic vein, IMV - inferior mesenteric vein, TR.C - transverse colon, LCF - left colic flexura, * the anomalous branch of the splenic artery.

arteries. These vessels supply the derivatives of the foregut, midgut and hindgut.¹² Embryologically, the splenic artery is one of the branches of the artery of foregut, namely, coeliac trunk.^{4,13} It supplies the spleen, pancreas, stomach and greater omentum.¹⁴ The superior mesenteric artery is the artery of the midgut and supplies the gastrointestinal tract from the middle of the second part of the duodenum as far as the distal one-third of the transverse colon. The inferior mesenteric artery is the artery of the hindgut and supplies the large intestine from the distal one-third of the transverse colon to halfway down the anal canal.² Greater part of the transverse colon is supplied by middle colic artery, a branch of the superior mesenteric artery. The distal part of the transverse colon is supplied by left colic artery, a branch of inferior mesenteric artery.¹⁰ In the current case, an artery of foregut supplies an area of the hindgut. One possible embryologic explanation for the variable positions of the lienal artery could be as follows. The sites of origins of hindgut and foregut arteries on the aorta are different and far from each other during development.¹⁰ The variation in the branching of the splenic artery might be due to the abnormal migration of these arteries or abnormal fusion among these primitive arteries. The variations in the branching of splenic artery are well documented.^{4-6,14} In their 27 case study, Amonoo-Kuofi et al¹¹ found an anomalous middle colic artery from the proximal segment of the splenic artery. Liu¹⁰ reported a branch from splenic artery to the left colic flexura. However, none of these variations were similar to the present case. This is a rare and interesting variation which an artery of

foregut supplies an area of hindgut. Awareness of variations of splenic artery during surgery would help minimize vascular complications. In advertent transection of the splenic artery during splenectomy or pancreatectomy may cause postoperative bleeding or necrosis of the transverse colon. On the other hand, the numerous and uncertain nature of the vascular supply makes splenic vessel preservation technically challenging in pancreatic surgery.¹⁵ The existence of anatomical variation of the splenic artery should be kept in mind of clinicians to avoid complications during surgical intervention of the pancreas, spleen or colon.

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References

1. Williams PL, Bannister LH, Berry MM, Collins P, Dyson M, Dussek JE, et al. Cardiovascular. In: Gray's Anatomy. 38th ed. New York: Churchill Livingstone; 1995. p. 1551-1552.
2. Snell RS. The abdomen: Part II The Abdominal Cavity. In: Clinical Anatomy for Medical Students. 5th ed. New York: Little, Brown and Company; 1995. p. 210-211.
3. Lowenberg RI. The splenic artery; its special anatomy in reference to use as a vascular graft. *AMA Arch Surg* 1959; 79: 135-140.
4. Pandey SK, Bhattacharya S, Mishra RN, Shukla VK. Anatomical variations of the splenic artery and its clinical implications. *Clin Anat* 2004; 17: 497-502.
5. Daisy Sahni A, Indar Jit B, Gupta CN, Gupta DM, Harjeet E. Branches of the splenic artery and splenic arterial segments. *Clin Anat* 2003; 16: 371-377.
6. Jauregui E. Anatomy of the splenic artery. *Rev Fac Cien Med Univ Nac Cordoba* 1999; 56: 21-41.

7. Troppmann C, Pirenne J, Perez RV, Gruessner RW. The unrecognized posterior gastric artery: A potential cause of surgical complications in pancreas transplantation. *Clin Transplant* 2004; 18: 214-218.
8. Ozan H, Onderoglu S. Intrapaneatic course of the splenic artery with combined pancreatic anomalies. *Surg Radiol Anat* 1997; 19: 409-411.
9. Özbek A, Uluutku H, Yeginoglu G. Truncus coeliacus varyasyonu. *SBAD* 1996; 7: 39-41.
10. Liu ST. Rare case of left colic flexure is supplied by a branch from splenic artery- a case report. *Kaohsiung J Med Sci* 2002; 18: 205-207.
11. Amonoo-Kuofi HS, el-Badawi MG, el-Naggar ME. Anomalous origins of colic arteries. *Clin Anat* 1995; 8: 288-293.
12. Sadler TW. Langman's Medical Embryology. **Place of publication:** Williams and Wilkins; 1990. p. 212.
13. Hamilton WJ, Mossman HW. Alimentary and respiratory system, pleural and peritoneal cavities. In: Hamilton, Boyd and Mossman's human embryology. 4th ed. London: Macmillan Press; 1976. p. 291-376.
14. Zeon SK, Kim SG, Huyn JA, Kim YS. Angiographic branching patterns of the splenic artery. *International Journal of Angiology* 1998; 7: 57-61.
15. Grodski S, Christophi C. Distal pancreatectomy with preservation of the spleen and splenic vessels. *ANZ J Surg* 2001; 71: 763-764.