

Unusual branch of superior mesenteric artery

Arpan Haldar

Assistant Professor, Department of Anatomy, ESI-PGIMSR & ESIC Medical College, Joka, Kolkata, India

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Address for Correspondence:

Dr. Arpan Haldar.
Purbachal Housing Cluster-4,
Flat-A/13, GA-Block, Sector-3,
Salt lake, Kolkata 700097, India.
Mobile: 09007339156; **E-mail:**
dr.arpanhaldar@gmail.com

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ABSTRACT

Knowledge of the anatomical variations of the colic arteries is clinically important during abdominal surgeries and radiological invasive procedures. During routine dissection in the Department of Anatomy, ESI Medical College, Kolkata, an anomalous common trunk arising from superior mesenteric artery, giving a slender pancreatic and a thick colic branch was observed. The colic branch passes in front of the anterior surface of left kidney and anastomose with ascending branch of left colic artery, arising from the inferior mesenteric artery. The common trunk was thus seen to supply the whole transverse colon and upper 2/3rd of descending colon but the left colic was supplying only the lower 1/3rd of descending colon. These types of variations have embryological and clinical implications. The anomalous origin and course of the common trunk can be considered vulnerable as it is liable to injury during pancreatic, colonic, and renal surgeries.

Key words: Superior mesenteric artery, Colic artery, Inferior mesenteric artery

INTRODUCTION

The knowledge of the anomalous arterial branching patterns of colic branches of mesenteric arteries is essential from the view point of surgical and radiological anatomy. The superior mesenteric artery (SMA) is the artery of mid gut. SMA originates from the aorta 1 cm below the celiac trunk, posterior to the splenic vein, and the body of the pancreas. It ends by giving branches to ileum and form an anastomosis with a branch of ileo-colic artery in most of the cases. The artery gives off several branches which include; the inferior pancreaticoduodenal artery from the posterior aspect, jejunal, and ileal branches from the left surface and ileo-colic, right colic, and middle colic branches from right surface.¹

The left colic artery (LCA) is the first branch of the inferior mesenteric artery. It divides into two branches, the ascending branch anastomose with the left branch of the middle colic artery whereas the descending branch anastomose 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 colon.¹

Numerous variations of the SMA and LCA regarding origin, course, and branching pattern have been reported in the literature. Rarely, it may arise from the superior mesenteric artery² or celiaco-mesenteric artery.³ Frequently, LCA and sigmoid arteries may arise as a common trunk from the inferior mesenteric artery.⁴

The most common variation of SMA is associated with the origin of a right hepatic artery which arises from the SMA.⁵ Herein a case of abnormal origin of LCA from superior mesenteric artery and its anomalous course across the left kidney was reported.

MATERIALS AND METHODS

The present study was conducted on a male cadaver aged approximately 70 years in the Department of Anatomy, ESI-PGIMSR, Kolkata during routine dissection on 7 January, 2016. The dissection was conducted as per Cunningham's manual of practical anatomy. The peritoneum and the viscera's were carefully separated and cleaned from the field of view. SMA was then traced proximally and distally. Origin, course and branching pattern of SMA and IMA were carefully observed. The case was thoroughly dissected, colored, displayed and photographed.

RESULTS AND ANALYSIS

During dissection an anomalous common trunk was seen arising from SMA. The common trunk gave a slender pancreatic and a thick colic branch. The colic branch passes in front of the anterior surface of left kidney and anastomoses with ascending branch of left colic artery, arising from inferior mesenteric artery. The left colic artery was appearing smaller as compared to normal cases. The common trunk was thus seen to supply the whole transverse

colon and upper 2/3rd of descending colon but the left colic was supplying only the lower 1/3rd of descending colon. Inferior pancreatico-duodenal artery was normally arising in addition to slender pancreatic branch from SMA. Other branches of SMA had normal course and distribution. There was no major venous anomaly seen.

DISCUSSION

Morphological variations of colic branches of mesenteric arteries are clinically important during pancreatic, renal, and colorectal surgeries. The anomalous origin and course of the common trunk from SMA can be considered vulnerable as it is liable to injury during such procedures. Variations of the left colic artery are, however, extremely rare. Origin of the left colic artery from superior mesenteric artery is seen in less than 1% of cases. There have been reported cases of the superior mesenteric artery giving a branch to the descending colon, and they named the branch as accessory LCA.² Although there are a few reports on its variations, there is no report on its close relation with the inferior border of the body of the pancreas, as seen in the present case study. Jiji et al.⁶ observed a case of anastomosis between the left colic artery and dorsal pancreatic artery. Contrary to classical anatomy text books, Niculescu et al.⁷ have observed the superior left colic artery arising from the superior mesenteric artery.

Kitamura et al.⁸ suggested the embryological explanation for development of the celiac-mesenteric system. According to him the seven primitive splanchnic branches arising from the abdominal aorta in embryo are connected by the ventral longitudinal anastomosis among the roots of omphalo-mesenteric artery, of which some disappear and classical branches of celiac trunk, SMA, and IMA are formed. The embryological explanation of our case may be that the classical branching pattern of SMA and IMA were not properly developed in this developmental stage.

Careful attempt to delineate the branching pattern of the superior mesenteric intra-operatively is recommended to avert possible dismal surgical outcome in surgical procedures like right hemicolectomy, resection of transverse colon, and en bloc resection of head of pancreas. An angiographic study to further delineate functionality of the arterial anastomoses in this region is recommended in living

subjects. Knowledge of this rare anatomical variant of left colic artery is of significant clinical importance in pancreatic surgeries such as Whipple's procedure for treatment of pancreatic carcinomas, in vascular studies and radiological interventional procedures such as Transcatheter Arterial Embolization in the treatment of ruptured left colic artery aneurysm.

Pancreatic surgery, in particular the pancreaticoduodenectomy is considered to be a formidable surgery.⁹ Postoperative bleeding occurs in 3–13% of patients after pancreatic surgery.¹⁰ Knowledge of variations of visceral arteries of the abdomen is important for a successful approach of invasive procedures.

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