

CASE REPORT

A VERY RARE VARIATION OF THE SUPERIOR MESENTERIC ARTERY- A CASE REPORT

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ABSTRACT: Variations in branching pattern of arteries are common. These variations are usually due to the changes occurring during the development of vessels. Knowledge about the variations of the arteries is very important since the arteries are used in many diagnostic techniques, operative procedures and in angiographic examinations. The arterial pattern of abdominal vessels present many variations and they are documented already in many studies. But this report presents a very rare variation of superior mesenteric artery and not yet reported anywhere.

KEY WORDS: Superior mesenteric artery, Inferior mesenteric artery, Common middle-right-left colic trunk.

INTRODUCTION: The abdominal aorta has anterior, lateral and posterior branches as it passes through the abdominal cavity. The three anterior branches supply the gastrointestinal viscera: the Celiac Trunk, The Superior Mesenteric Artery and the Inferior Mesenteric Arteries.

The celiac trunk is the anterior branch of the abdominal aorta supplying the foregut. It arises from the abdominal aorta immediately below the aortic hiatus of the diaphragm, anterior to the upper part of vertebra L1. It immediately divides into the left gastric, splenic and common hepatic arteries.

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The superior mesenteric artery (SMA) is the anterior branch of abdominal aorta supplying the midgut. It arises from the abdominal aorta immediately below the celiac artery, anterior to the lower part of vertebra L1. After giving of its first branch the inferior pancreatico-duodenal artery the superior mesenteric artery gives off jejunal and ileal arteries on its left side. Branching from the right side of the main trunk of the superior mesenteric artery are three vessels- the middle colic(MCA), right colic(RCA) and ileocolic arteries – which supply the terminal ileum, caecum, ascending colon and right two thirds of transverse colon.

The inferior mesenteric artery (IMA) is the anterior branch of the abdominal aorta that supplies the hindgut. It is the smallest of the three branches of the abdominal aorta and arises anterior to the body of the vertebra L III. Initially the inferior mesenteric artery descends anteriorly to the aorta and then passes to the left as it continues inferiorly. Its branches include the left colic artery, several sigmoidal arteries and the superior rectal artery.

The left colic artery is the first branch of the inferior mesenteric artery. It ascends retroperitoneally, dividing into ascending and descending branches. The ascending branch passes anteriorly to the left kidney, then enters the transverse mesocolon, and passes superiorly to supply the upper part of the descending colon and the distal part of the transverse colon. It anastomoses with the branches of the middle colic artery. The descending branch passes inferiorly, supplying the lower part of the descending colon and anastomoses with the first sigmoid artery.

The sigmoid arteries consist of two or four branches, which descend to the left, in the sigmoid mesocolon, to supply the lowest part of the descending colon and sigmoid colon. These branches anastomose superiorly with the branches from the left colic artery and inferiorly with the branches from superior rectal artery.

The terminal branch of the inferior mesenteric artery is the superior rectal artery¹².

CASE REPORT: We found a very rare variation in branching pattern of Superior mesenteric artery (SMA) in a 56year old female cadaver during routine dissection of abdomen for undergraduate students in department of Anatomy Govt Dharmapuri medical college. The Superior mesenteric artery arose from the abdominal aorta at the level of LI vertebra. It gave rise to inferior pancreatico-duodenal artery as first branch (Fig1). Many jejunal and ileal branches arose from the left side of the artery. The SMA gave rise to a Common trunk which arose from its anterior surface which arose 1cm distal to the origin of inferior pancreatico-duodenal artery (Fig2). This common trunk divided into three branches as middle colic, right colic and left colic arteries (Fig3). The left colic artery arose SMA but not from the inferior mesenteric artery. The middle colic artery divided into right and left branches. The right colic artery divided into ascending and descending branches. The left colic artery divided into ascending and descending branches. From the distal end of the right concavity of SMA, it gave rise to ileocolic artery). Ileocolic artery divided into ascending and descending branches. The Inferior mesenteric artery (IMA) gave rise to few sigmoidal arteries and the IMA continued as superior rectal artery (Fig4).

The descending branch of ileocolic artery anastomosed with the terminal branch of SMA. The ascending branch of ileocolic artery anastomosed with the descending branch of right colic artery. The ascending branch of right colic artery anastomosed with the right branch of middle colic artery. The left branch of middle colic artery anastomosed with the ascending branch of left colic artery. The descending branch of left colic artery anastomosed with higher sigmoid branch of Inferior mesenteric artery (Fig5).

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DISCUSSION: The variations in the branches of the superior mesenteric artery are very common and many studies are available. The middle colic artery arises from the superior mesenteric, either while this vessel lies behind the pancreas or as it emerges at its lower border. It frequently (30% to 50%) arises through a common stem which it shares with the right colic artery. Rarely, it shares a common stem with both right colic and the ileocolic, or it arises from the celiac trunk or one of its branches, with the inferior pancreaticoduodenal artery¹. Steward and Rankin² found sometimes (27%) an additional branch from middle colic running toward the left colic flexure and reinforcing the marginal artery near that point, and in 10% of cases found an accessory middle colic arising from the superior mesenteric (above the origin of the major middle colic) and running to the left in the mesocolon to anastomose with the marginal artery near the flexure. Griffiths³ found no middle colic in 22% of 100 cases. He also found variations in the course of left colic artery. He described a downward loop of the vessel before turning upward toward the left colic flexure (15%) and a transverse course, toward the descending colon (5%). He found no left colic in 6 percent. Michels and co workers⁴ found an origin of right colic artery from the superior mesenteric artery in 38%, an origin with the middle colic artery in 52%, and one with the ileocolic artery in 8%. They observed an accessory middle colic artery in 8% and no middle colic in 3%.

Mohanty et al⁵ reported that the right colic artery is the most variable branch. In his report there was no right colic artery. Dr. Ashwini H et al⁶ found in their study that in 90% of cases the middle colic and in 66% the ileocolic artery arose directly from the superior mesenteric artery. The most variable artery was the right colic artery. In 46% of cases, the RCA arose as a direct branch from SMA, whereas in 10% cases it formed common stem with MCA and in 34% with ICA. The RCA was absent in 10% of cases. Bergman et al⁷ in his case, reported that the MCA, the first branch of SMA most commonly originates as an independent branch from SMA or arises along with the RCA as a common stem. Nelson et al⁸ found in their study two rare variations in middle colic artery. In 4% cases the MCA was branching off from ileocolic artery, in 16% of cases two middle colic arteries were present. Manoharan et al⁹ presented that the left colic artery arose from the celiac trunk. Katagiri H et al¹⁰ reported that the left colic artery arose from the superior mesenteric artery. Basmajian¹¹ agreed that the right colic artery arises more commonly with either the middle colic or the ileocolic.

CONCLUSION: Superior mesenteric artery and its branches are most commonly used vessel in many surgical and radiological procedures. In the current case there is a very rare variation which we never come across in textbooks. Knowing these type of variations will be helpful for the clinicians, to do the procedures skilfully and they can do without complications when doing angiographic procedures in the abdomen, laparoscopic surgeries and in diagnosing pancreatic carcinomas.

ABBREVIATIONS:

AA- ABDOMONAL AORTA

CT-COELIAC TRUNK

SMA-SUPERIOR MESENTERIC ARTERY

SMV- SUPERIOR MESENTERIC VEIN

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IMA- INFERIOR MESENTERIC ARTERY

MCA- MIDDLE COLIC ARTERY

RCA- RIGHT COLIC ARTERY

ICA- ILEOCOLIC ARTERY

LCA- LEFT COLIC ARTERY

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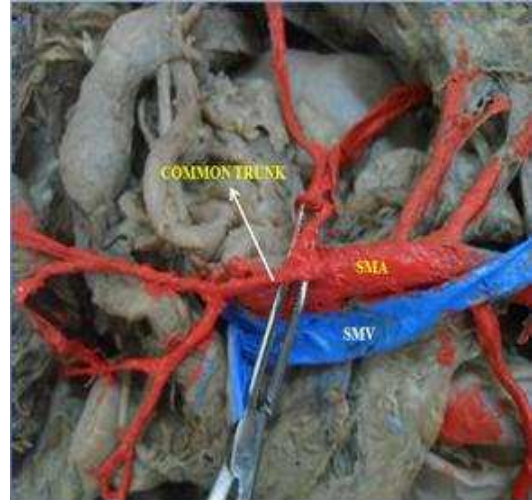
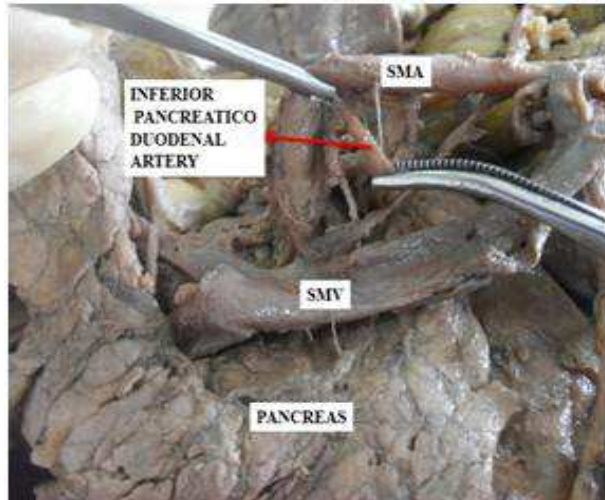


FIG1: Inferior pancreaticoduodenal artery from SMA FIG 2: Common trunk from SMA

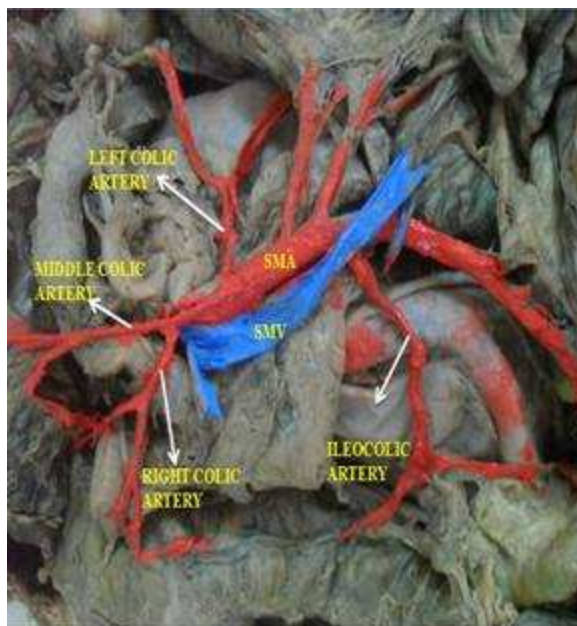


FIG3: Common trunk from SMA dividing into RCA,MCA & LCA

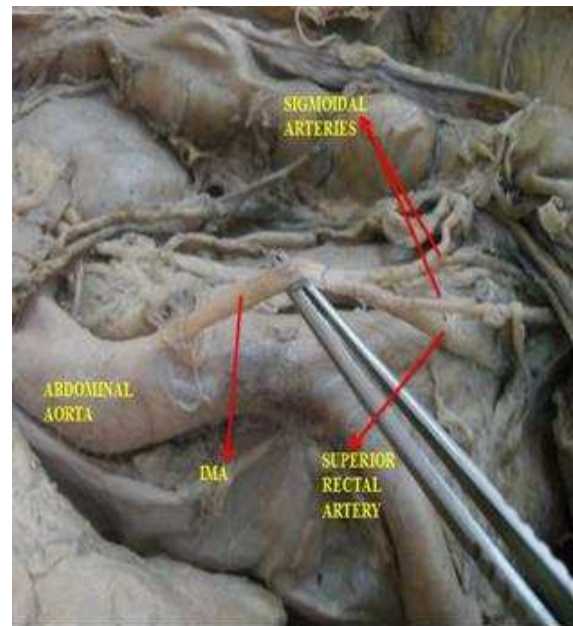


FIG 4: IMA with its branches (No left colic A)

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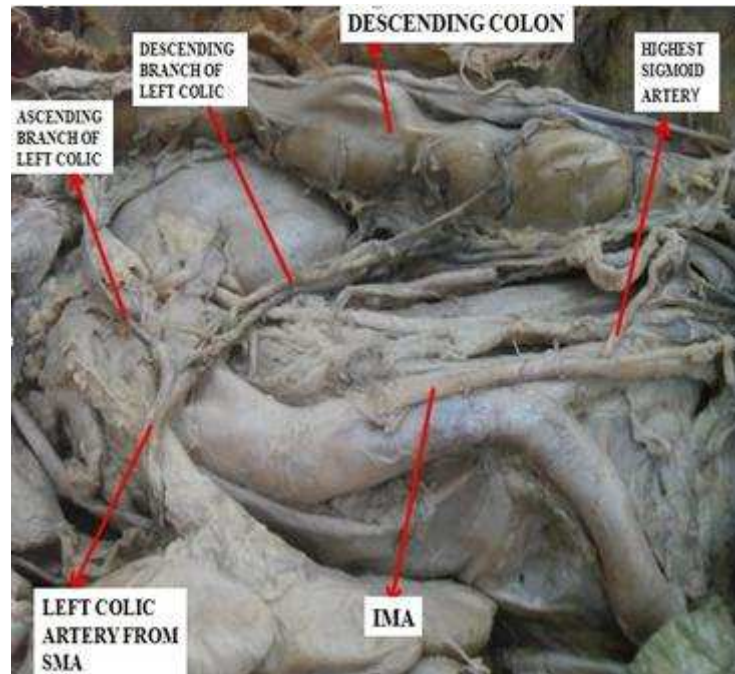


FIG 5: LCA from SMA anastomosing with the highest sigmoid artery of IMA.