



VARIATIONS IN THE BRANCHING PATTERN OF INFERIOR MESENTERIC ARTERY IN HUMANS

Anatomy

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ABSTRACT

In current day practice of medicine, diseases affecting large bowel and its blood supply are commonly seen. Penetrating abdominal injuries caused due to road traffic accidents and direct violence (homicide), are the common cause of large bowel injuries. Most abdominal vascular injuries result from penetrating trauma and are associated with other abdominal injuries.

Vascular injuries are much more common after abdominal gunshot wounds (25% of patients) as compared with stab wounds (10%). Inferior mesenteric artery is one of the three ventral branches of abdominal aorta which supplies the hindgut. It arises from front of aorta at the level of third lumbar vertebra (L3). Branches of inferior mesenteric artery are:- 1. left colic artery . 2. sigmoid arteries. 3. superior rectal artery as a continuation of inferior mesenteric artery. The parts of large intestine supplied by inferior mesenteric artery are namely, left one third of transverse colon, the entire descending and sigmoid colons, the rectum and upper part of the anal canal up to the pectinate line.

KEYWORDS

Introduction: Inferior mesenteric artery is one of the three ventral branches of abdominal aorta which supplies the hindgut. It arises from front of aorta at the level of third lumbar vertebra (L3). At the origin it is overlapped by the third part of the duodenum. The trunk of the artery passes retroperitoneally downwards along the left side of the aorta. Inferior mesenteric artery enters the lesser pelvis after crossing the left common iliac artery on the medial side of the left ureter. In the lesser pelvis, the artery is accompanied with inferior mesenteric vein on its left side. Inferior mesenteric artery continues as the superior rectal artery which runs along the descending limb of the root of the sigmoid mesocolon. On reaching the recto sigmoid junction superior rectal artery divides in to two lateral branches. These lateral branches pierce the rectal wall and break up into a sub mucous plexus and anastomose with the middle rectal arteries. Branches of inferior mesenteric artery are :- 1. left colic artery . 2. sigmoid arteries. 3. superior rectal artery as a continuation of inferior mesenteric artery.

Aims and objectives:

Aims: Aim of the study is to study the origin and branching pattern of the inferior mesenteric artery in 30 human cadavers of mixed sexes. To know the point of origin from abdominal aorta and to understand the extent of the large gut supplied by the inferior mesenteric artery.

Objectives:

The objective of the study is to know the area supplied by the Inferior mesenteric artery and its branches arising at what level to know the area supplied by each branch. The present study is undertaken to find out the branching pattern of the inferior mesenteric artery. This is unique study done in thirty specimens of human adult cadavers of mixed sexes.

As perforating abdominal injuries are common in case of violence and road traffic accidents hope this study will be of use for surgeons.

Materials And Methods: The cadavers used for the study of the inferior mesenteric artery and its branching pattern are obtained from the department of anatomy PES institute of medical sciences and research, kuppam, chittoor district, Andhra Pradesh. The cadavers are properly embalmed and preserved. The materials used are as follows: Toothed forceps, Blunt forceps, Pointed forceps, Scissors, needles. Instruments used for paintings are: Red colour fluorescent enamel paint or oil bond paint, Zero size painting brush, Fevicol adhesives for proper fixation of the paint, Glycerin for shiny appearance, Cotton, Electric fans for drying, A high resolution 12 mega pixel digital camera was used for obtaining high quality images. A computer was used for better presentation and editing of the study.

Observation:

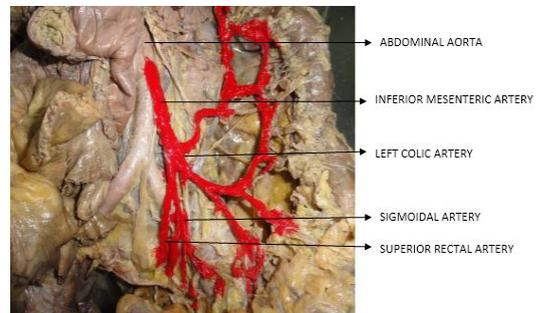


Fig. 1. Inferior Mesenteric Artery Showing Normal Branching Pattern

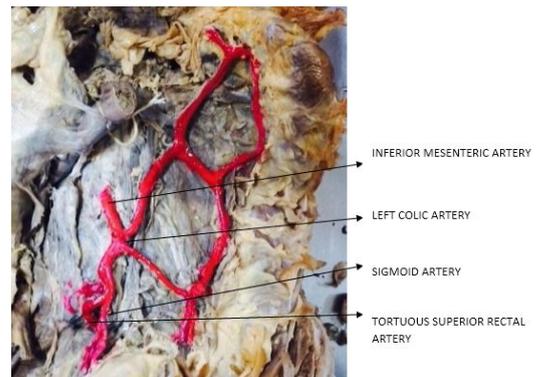


Fig. 2. Tortuous Superior Rectal Artery

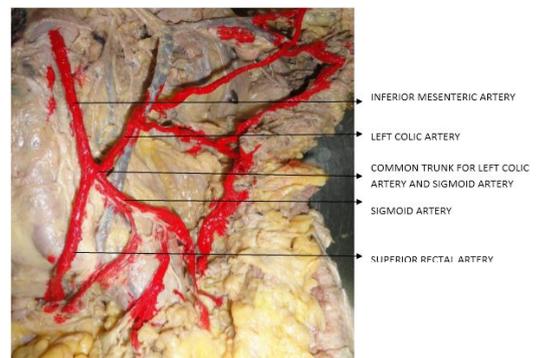


Fig. 3. Common Trunk For Left Colic Artery And Sigmoid Artery

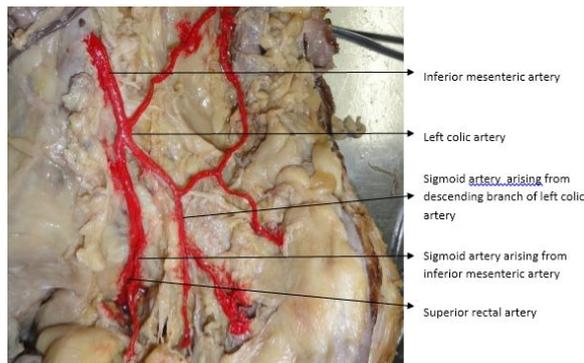


Fig. 4. Sigmoid artery arising from descending branch of left colic artery

Discussion: In this study, thirty human inferior mesenteric arteries were compared and their branching pattern were studied. The inferior mesenteric arteries were arising from the ventral aspect of the abdominal aorta before its bifurcation in all thirty specimens. In 21 specimens, the first branch from inferior mesenteric artery was left colic artery. In 9 specimens, first branch from inferior mesenteric artery was common trunk from which the left colic artery and sigmoid artery were arising. In 20 specimens, left colic artery immediately after origin from inferior mesenteric artery divided into ascending and descending branches. In 8 specimens, left colic artery was not dividing immediately after its origin. Instead, it travels a short distance and then divides into ascending and descending branches. In 2 specimens, left colic artery was not dividing into ascending and descending branches. Instead, it directly reaches splenic flexure of colon and ramifies close to the wall of the colon to supply it. In 21 specimens, the sigmoid arteries were arising from inferior mesenteric artery. In 8 specimens, the sigmoid arteries were arising from common trunk along with left colic artery. In one specimen, sigmoid artery was arising from descending branch of left colic artery. In 6 specimens, descending branch of left colic artery was giving one extra sigmoid artery which ramifies further to supply sigmoid colon. In our study, number of sigmoid arteries ranges from one to three in number. One sigmoid artery in 3 specimens, two sigmoid arteries in 20 specimens, three sigmoid arteries in seven specimen. In 6 specimens having two sigmoid arteries one sigmoid artery was coming from inferior mesenteric artery and the other sigmoid artery was coming from descending branch of left colic artery. In 23 specimens, single sigmoid artery was first arising from inferior mesenteric artery and later divided into 2 or 3 branches. In one specimen, sigmoid artery was arising from descending branch of left colic artery and later divided in to 2 branches. In all the thirty specimens, inferior mesenteric artery was continuing as superior rectal artery. In 3 specimens, superior rectal artery was tortuous in its course.

Summary and conclusion: In the present study undertaken, 30 specimens of inferior mesenteric artery from adult cadavers of mixed sexes were taken and their branching pattern were studied. A survey of literature available and study done by other eminent researchers, it is mentioned that the inferior mesenteric artery gives three branches namely, 1. Left colic artery 2. sigmoid arteries (ranges from 1-4 in number) 3. Superior rectal artery (continuation of inferior mesenteric artery).

The present study undertaken here highlights the following features.

The left colic artery and sigmoid arteries can arise from a common trunk from inferior mesenteric artery. The number of sigmoid arteries ranges from 1-3 in number. The sigmoid artery can also arise from descending branch of left colic artery. The inferior mesenteric artery continues as superior rectal artery. As lapotomy surgeries are commonly done in cases of penetrating abdominal injuries with vascular involvement, the inference drawn from this study undertaken here will be of much use for the surgeons.

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