



Original Research Article

Variation in branching pattern of splenic artery and its surgical importance

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ABSTRACT

Background: Splenic artery commonly called as lineal artery being the largest branch of celiac trunk in adults and next largest to common hepatic artery in fetal life making tortuous course in stomach bed. The splenic artery show variations in its course and branching pattern frequently. The main aim of the study is to know the different branching pattern of splenic artery in relation to hilum of spleen for Anatomist, Radiologist and Surgeons. Such knowledge definitely help the radiologist while doing the color doppler flow imaging and also the surgeons in selecting the operative procedure thereby it minimize the vascular complications.

Materials and Methods: During routine dissection, 60 cadavers were dissected and the branching pattern of the splenic artery in relation to hilum of spleen was studied.

Results: Splenic artery shows following pattern of division, distributed pattern bundled pattern before entering the hilum of spleen and splenic artery enters the spleen without any division. In our study, distributed pattern was seen in 36 cases (60%), bundled type in 14 cases (23.3%) and without branching in remaining 10cases (16.7%).

Conclusion: The variation in the branching pattern of splenic artery is necessary for Anatomist useful in angiographic studies for radiologist and also for surgeons to minimise vascular complications during abdominal surgeries, spleen preservation procedure is possible distributed and bundled pattern of splenic artery.

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1. Introduction

Splenic artery commonly called as lineal artery being the largest branch of celiac trunk in adults and next largest to common hepatic artery in fetal life making tortuous course in stomach bed. It courses superior and anterior to the splenic vein, along the superior border of the pancreas. Near the splenic hilum, the artery usually divides into superior and inferior terminal (IT) branches, and each branch further divides into four to six segmental intrasplenic branches.¹ The branches of splenic artery entering into the spleen through poles of the spleen are called polar arteries, i.e., superior and inferior polar arteries.² The gastric branches of the splenic artery include the left gastroepilpoic, short

gastric artery and sometimes, posterior gastric artery (PGA). PGA when present arises from the splenic artery in its middle section posterior to the body of the stomach. It ascends behind the peritoneum of the lesser sac towards the fundus of stomach and then reaches the posterior surface of the stomach in the gastrophrenic fold.³ The PGA supplies the superior portion of the posterior wall of the gastric body, near the cardiac area, and the fundus. Many variations in the course and branching patterns of splenic artery are mentioned in the literature.^{4–8}

This variation in the branching pattern of the splenic artery can be correlated with its embryological development. The coeliac, superior mesenteric and inferior mesenteric arteries are derived from fusion of the vitelline arteries supplying the yolk sac, and are located in the dorsal mesentery of the gut. These vessels supply the derivatives

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of the foregut, midgut and hindgut.⁹ Embryologically, the splenic artery is derived from the celiac trunk.¹⁰ It supplies the spleen, pancreas, stomach and greater omentum.¹¹

2. Materials and Methods

During the routine dissection about 60 cadavers were studied for the branching pattern of splenic artery in the Department of Anatomy, Subbaiah Institute Of Medical Sciences, Shivamogga and Government Vellore Medical College, Vellore.

Peritoneal cavity was explored and stomach was turned superiorly. The celiac trunk was identified and cleared and branches were traced. The splenic artery was traced distally and the terminal branching pattern was noted. The splenic artery and its terminal branches were painted with red color and photographed.

3. Observation and Results

In our study, we observed that the Splenic artery entered the hilum without branching [Figure 1] in 10 cadavers (16.7%). Distributed type [Figure 2] was observed in 36 cases (60%) and Bundled/ Marginal type, [Figure 3] was seen in 14 cases (23.3%).

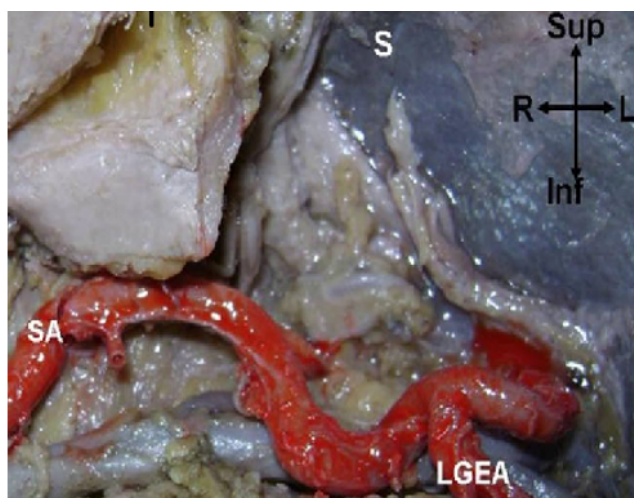


Fig. 1: Splenic artery without any terminal branches enters the spleen. {SA – Splenic artery, S – Spleen, LGEA – Left gastro epiploic artery }

4. Discussion

The present study clearly indicates that there is variation in origin, course, and terminal distribution pattern of the splenic artery. The knowledge of these variations are of significant importance during surgical and radiological procedure of upper abdominal region to avoid any catastrophic complications.

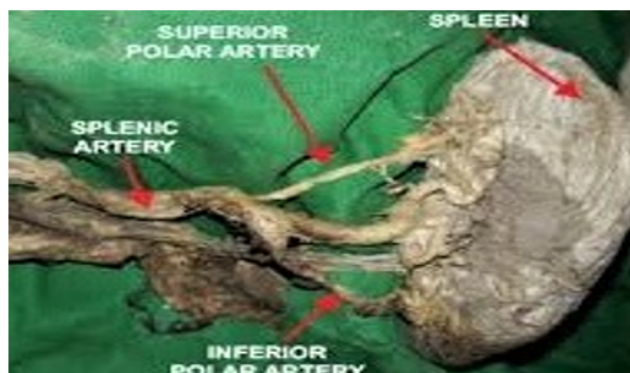


Fig. 2: Distributed type with long terminal branches

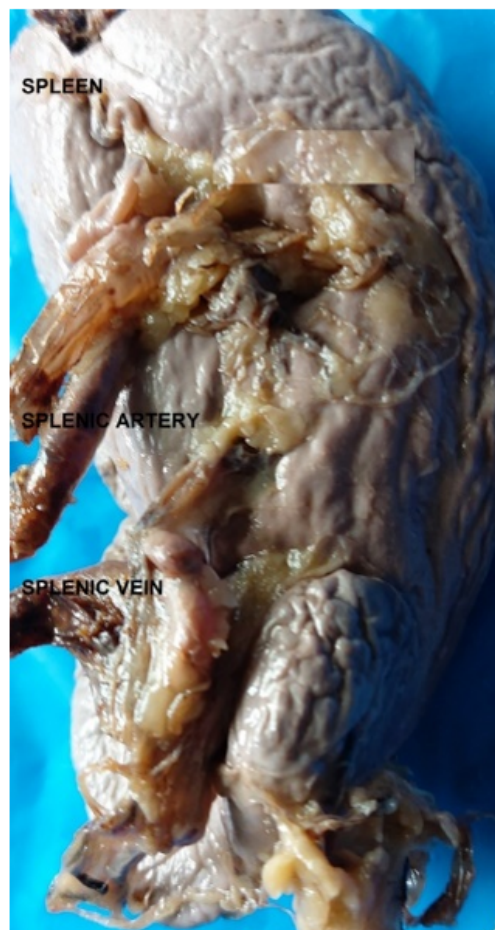


Fig. 3: Bundled type with short terminal branches

Table 1: Terminal branching pattern compared with other studies

Study	Year	Number of specimens	Entered hilum without branching	Distributed type	Bundled type
Pandey SK et al ⁴	2004	320	2.8%	98%	
XUwei - li et al ¹¹	2009	-	-	69.60%	30.40%
Treutner et al ¹²	1993	32	-	84.40%	9.40%
Ashok et al ¹³	2015	76	10.50%	55.30%	55.30%
Present study	2020	60	16.7%	60%	23.3%

5. Conclusion

Spleen can be preserved in distributed and bundled type of splenic artery during splenic surgeries whereas in distal terminal branching pattern even embolization is possible selectively in order to prevent post-operative sequelae. We anatomists submit that awareness of variations of splenic artery branching pattern as described in the current report would contribute to minimise vascular complications during abdominal surgeries.

6. Conflict of Interest

None.

7. Source of Funding

None.

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