

Superior polar artery arising from the splenic artery: a case report

Sukhinder Baidwan^{*1}, P.K.Gupta¹ and Kunal Chawla²

¹Dept. of Anatomy, Gian Sagar Medical College & Hospital, Ramnagar, Patiala, Punjab, India and

²Dept. of Anatomy, Postgraduate Institute of Medical Education & Research, Chandigarh, India

SUMMARY

The splenic artery shows numerous variations in its origin, course and branching pattern. Anatomical knowledge of variations of the branching pattern of the splenic artery is necessary to successfully accomplish surgical, oncologic or any interventional procedures on organs of the supracolic part of the abdominal cavity. This study reports the presence of a variant superior polar artery in a sixty year old male cadaver. A superior polar branch of the splenic artery, if present, usually arises 3-5 cm proximal to the splenic hilum and has an average length of 3.9 cm. We describe a rare variation of the superior polar artery 7.6 cm long and arising 6.4 cm proximal to the splenic hilum. Prior knowledge of the presence of such a variation can contribute to avoiding iatrogenic injuries and inadvertent complications during splenic surgery.

Key words: Superior polar artery – Splenic artery – Splenic hilum

INTRODUCTION

The splenic artery is the largest branch of the coeliac trunk and supplies the spleen and substantial portions of the stomach and pancreas. It courses along the superior border of the pancreas, lying just superior and anterior to the splenic vein. Near the splenic hilum, the splenic artery usually divides into 2-3 terminal branches, and each branch further divides into 4-6 segmental intra-splenic branches (Standing, 2005).

***Corresponding author:** Sukhinder Baidwan. Dept. of Anatomy, Gian Sagar Medical College & Hospital, Ramnagar, Patiala, Punjab, India 140601. Tel: 09872812002. E-mail: dr.sukhi313@gmail.com

A superior polar artery usually arises from the distal splenic artery, near the hilum, but it may originate from the superior terminal branch of the splenic artery. The superior polar artery is quite constant, generally arising approximately 2-3 cm from the splenic hilum. It supplies the upper pole of the spleen without passing through the hilum (Mulholland et al., 2006).

CASE REPORT

We describe the occurrence of a superior polar artery (7.6 cm long), a branch of the splenic artery, which was seen during routine educational dissection of a 60 year old male cadaver of Asian origin in our department (Figure 1). The splenic artery (11.7 cm long) extended tortuously along the superior margin of the pancreas up to the splenic hilum. A superior polar artery took origin from the main trunk of the splenic artery 6.4 cm proximal to the splenic hilum and ran a tortuous course to enter the superior pole of the spleen. The superior polar artery was 7.6 cm long and did not give any branches. The splenic artery divided into a superior and inferior terminal branch 3.3 cm proximal to the splenic hilum, and each terminal branch further gave two branches.

DISCUSSION

There is high prevalence of variations in the origin, course and branching pattern of the splenic artery. Each splenic artery has its own peculiar pattern of terminal branches (Pandey et al., 2004). Embryologically, the splenic artery is one of the branches of the artery of the foregut—i.e., the coeliac trunk. Anatomical variations of the splenic artery are due to aberrations in its embryological development (Hamilton and Mossman, 1976).

The incidence of the presence of a superior polar artery has been reported to be 65% (Michels,

Submitted: 10 December, 2012. *Accepted:* 4 September, 2013.

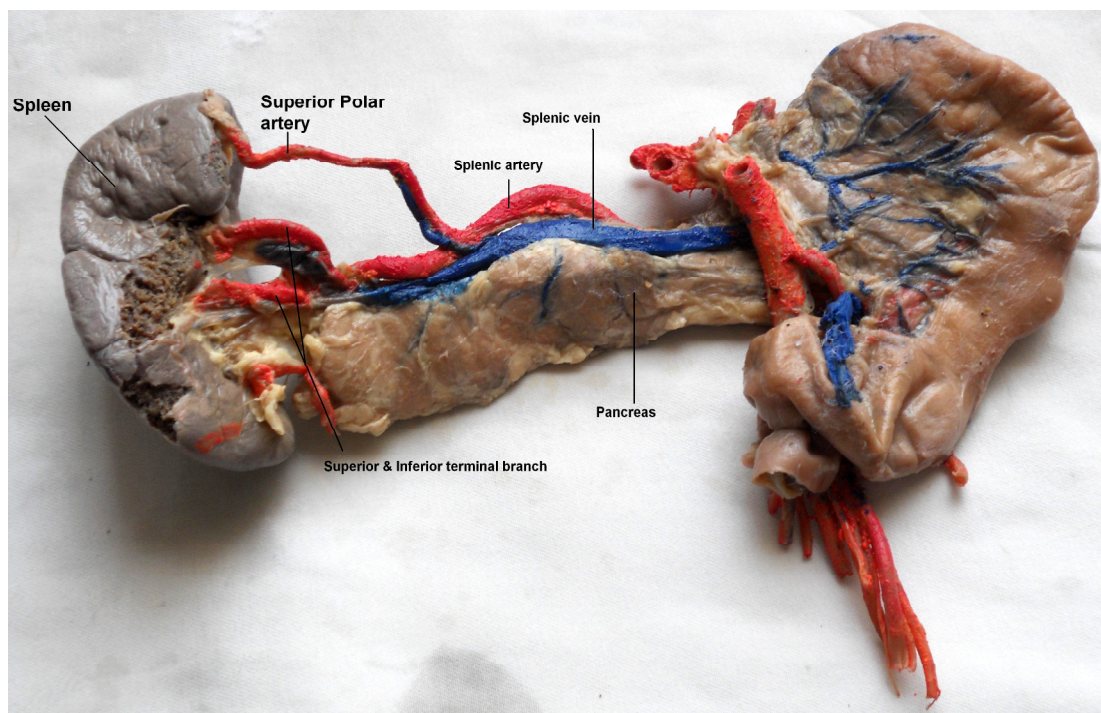


Fig. 1. Posterior view of pancreas and spleen showing the superior polar artery originating from splenic artery.

1942), 51% (Sahni et al., 2003) and 31.3% (Ignjatovic et al., 2005). A study by Trubel et al. in 1988 describes the incidence of superior polar artery as 48.4%. However, a superior polar artery with no branches to the stomach, as seen in the present case, has an incidence of 3.27%. The average extra-capsular length of the superior polar artery in the said study was 3.9 cm, as opposed to 7.6 cm in the present case.

The origin of the superior polar artery has been reported to be about 4-5 cm proximal to the splenic hilum by Sahni et al. (2003). The present case shows a more proximal origin of the superior polar artery (6.4 cm from splenic hilum), which is of fundamental importance to surgeons.

With the advanced laparoscopic techniques and the increasing use of splenic arterial interventions to treat various clinical conditions, including abdominal trauma, hypersplenism, splenic arterial aneurysm, portal hypertension and splenic neoplasms, knowledge of the variational anatomy of the splenic artery is indispensable. The different branching patterns of splenic artery should be taken into consideration by the surgeon during dissection of the splenic pedicle, or else there is a possibility of dangerous bleeding if damaged (Madoff et al., 2005).

REFERENCES

- Hamilton WJ, Mossman HW (1976) Alimentary and respiratory system, pleural and peritoneal cavities. In: Hamilton, Boyd and Mossman (eds) *Human Embryology*. 4th ed. Macmillan Press, London, pp 291-376.
- Ignjatovic D, Stimec B, Zivanovic V (2005) The basis for splenic segmental dearterialization: a post-mortem study. *Surg Radiol Anat*, 27: 15-18.
- Madoff DC, Denys A, Wallace MJ, Murthy R, Gupta S, Pillsbury EP, Ahrar K, Bessoud B, Hicks ME (2005) Splenic arterial interventions: anatomy, indications, technical considerations, and potential complications. *Radiographics*, 25: 191-211.
- Michels NA (1942) The variational anatomy of the spleen and splenic artery. *Am J Anat*, 70: 21-72.
- Mulholland MW, Lillemoe KD, Doherty GM, Maier RV, Simeone DM, Upchurch GR (2006) *Greenfield's Surgery: Scientific Principles and Practice*. 5th ed. Lippincott, Williams and Wilkins, Philadelphia, pp 301-308.
- Pandey SK, Bhattacharya S, Mishra RN, Shukla VK (2004) Anatomical variations of the splenic artery and its clinical implications. *Clin Anat*, 17: 497-502.
- Sahni D, Indra Jit, Gupta NM, Gupta M, Harjeet E (2003) Branches of the splenic artery and splenic arterial segments. *Clin Anat*, 16: 371-377.
- Standring S, Ellis H, Healy CH, Johnson D, Williams A, Collins P, et al. (editors) (2005) *Gray's Anatomy. The Anatomical Basis of Clinical Practice*. 39th ed. Elsevier Churchill Livingstone, London, pp 1241.
- Trubel W, Rokitansky A, Turkof E, Firbas W (1988) Correlations between posterior gastric artery and superior polar artery in human anatomy. *Anat Anz*, 167: 219-223.