Case Report

VARIANT ORIGIN OF LEFT INFERIOR PHRENIC ARTERY

Madhumita Datta *1, Enakshi Ghosh 2, Ritaban Sarkar 3, Hindol Mondal 4.

1 Demonstrator of Department of Anatomy, ESI Medical College, Joka, Kolkata, India.
2 Assistant Professor, Department of Anatomy, R. G. Kar Medical College, Kolkata, India.
3 Former Resident, Department of Anaesthesiology, Medical College, Kolkata, India.
4 Former Resident, Department of Pharmacology, Medical College, Kolkata, India.

ABSTRACT

Background: The inferior phrenic artery is seen as an important source of collateral arterial supply to hepatocellular carcinoma, the hepatic artery being the main source. Other pathologic conditions, such as diaphragmatic or hepatic bleeding due to trauma or surgery and bleeding resulting from gastroesophageal problems (Mallory-Weiss tear and gastroesophageal cancer) may also be related to inferior phrenic artery. We present here a case of left inferior phrenic artery taking origin from left gastric artery, showing significance of such variation.

Case Report: This was found during routine dissection of abdomen in a 60 yrs old adult male cadaver in the department of anatomy, R. G. Kar Medical College.

Observations: The variation was observed in the origin of left phrenic artery. It was seen that left phrenic artery took its origin from left gastric artery. Further distribution of left phrenic artery was normal. Right phrenic artery arose normally from abdominal aorta.

Conclusion: Considering the significance of inferior phrenic artery in transcatheter chemo-embolization of hepatocellular carcinoma and gastroesophageal bleeding, the knowledge of the variant origin of inferior phrenic artery is very important not only for the anatomists, but also for the radiologists and the surgeons.

KEY WORDS: Left inferior phrenic artery, Right inferior phrenic artery, Left gastric artery, Hepatocellular carcinoma, Transcatheter chemo-embolization, Gastroesophageal bleeding.

Address for Correspondence: Dr. Madhumita Datta, Demonstrator of Department of Anatomy, ESI Medical College, Joka, Kolkata, India. E-Mail: madhumitaanatomy@yahoo.com
rise to a small number of branches that serve to supply the superior pole of the spleen and the proximal portion of the stomach [4]. Potentially, IPA can communicate with internal mammary artery, intercostals artery, musculophrenic artery, pericardiophrenic artery and other systemic vessels of the thorax [1].

The RIPA and LIPA have been known for their provision of extrahepatic collaterals to hepatocellular carcinoma (HCC). In a case of hepatic arterial occlusion or in cases where the hepatoma is close to the bare area of liver, IPA angiography is done. Selective transcatheter arterial chemoembolization (TACE) from IPA is preferred. In case where proximal IPA is used for TACE, complications such as pleural effusion, basal atelectasis, weakness of diaphragm, and gastroesophageal ulcerations can occur [5]. There have been reports of gastroesophageal bleeding and Mallory-Weiss tear due to bleeding from LIPA [6]. During our dissection of abdomen, it was seen that LIPA took its origin from left gastric artery (LGA). This type of variation of origin of LIPA is rarely found in literature till now.

**RESULTS AND DISCUSSION**

Modern anatomy textbooks offer few details of the anatomy of the inferior phrenic arteries [7]. Several authors reported the variations of origin of IPA. Most of that cases, it was observed that IPA took variant origin from celiac trunk and renal artery, but very rarely from LGA and others. Pulakunta T et al, in 2007 during their study of 32 cadavers, observed that, IPA arose from LGA in one case (3.125%) [2]. In 2007, Gwon DI et al in their study, observed IPA arose from LGA in 3.7% of cases [8]. Another study done by Pick JW and Anson BJ in 1990 among 200 cadavers, revealed variant origin of IPA from LGA in 2.3% of cases [1]. According to Loukas M et al, RIPA in 3% of cases and LIPA in 2% of cases arose from LGA. This study was done among 300 cadavers without HCC [4]. Kim HC et al reported a case in a series of 23 patients in which the ascending branch of LIPA arose from LGA [9]. In their angiographic study, Tanaka R et al reported 13 patients (1.7%) with LIPA arising from left hepatic artery or LGA [10]. In a very recent study, done by Gurses AI et al among 26 cadavers showed, RIPA in one case arose from LGA and LIPA in six cases had different source of origin [11].

Embryologically celiac trunk and IPA are derived from six pairs of ventral splanchnic branches.
During fetal development, these branches span and disappear, however the persistence of longitudinal channels between these primitive vessels may lead to vascular variations [12].

CONCLUSION

All interventionalists associated with TACE of HCC or gastroesophageal bleeding management using embolization need to be aware of this variant anatomy of IPA to prevent nontarget embolization. Radiologists also must be familiar to this variation of IPA anatomy so that proper detection and correct intervention can be initiated when needed. Considering the importance of knowledge regarding the origin and course of IPA and paucity of information presently available concerning this variation, our study seemed important as it can provide valuable additional data to contemporary anatomical literature.

ABBREVIATIONS

IPA- Inferior phrenic artery
RIPA- Right inferior phrenic artery
LIPA- Left inferior phrenic artery
LGA- Left gastric artery
HCC- Hepatocellular carcinoma
TACE- Transecatheter chemo embolization

ACKNOWLEDGEMENTS

We sincerely thankful to all faculty members of the department of anatomy, R. G. KAR Medical college, and Dr. Pramila Tirkey for their guidance and kind cooperation for conducting this study.

Conflicts of Interests: None

REFERENCES
