

## CASE REPORT

**An Aberrant Artery Arising From Common Hepatic Artery***Surekha D. Jadhav<sup>1\*</sup>, Balbhim R. Zambare<sup>1</sup>**<sup>1</sup>Department of Anatomy, Padamashree Dr. Vithalrao Vikhe Patil Foundation Medical College, Ahmednagar-414111 (Maharashtra) India***Abstract:**

Common hepatic artery is the branch of celiac trunk which is chief artery of the foregut. Branches of celiac trunk supply the gastrointestinal tract and its associated glands which are derived from foregut. Anatomy and variations of hepatic arterial system have become increasingly important due to increasing number of laparoscopic procedures, oncologic surgical interventions, and organ transplant cases. This case report describes a rare anatomical variation of an aberrant artery arising from common hepatic artery before the origin of gastroduodenal artery and proper hepatic artery. The aberrant artery traversed inferiorly and behind the body of the pancreas which divided into a right and left branches. The right branch ran behind the neck of the pancreas and it ended after giving few branches to head and body of pancreas. However, the left branch gave off branches to the proximal part of the jejunum. The presence of a branch arising directly from the common hepatic artery supplying the pancreas and jejunum is uncommon. Knowledge of such a rare variation is important not only for surgeons but also interventional radiologists and those studying anatomy.

**Keywords:** Common Hepatic Artery, Celiac Trunk, Anatomical Variation, Pancreas, Jejunum

**Introduction:**

Celiac artery is the highest branch of the abdominal aorta which generally arises at the lower border of the twelfth thoracic vertebra. It is a wide short trunk, being 1-1.3 cm in length and surrounded by the celiac plexus of nerves. It is normally divided into two larger branches, the common hepatic and splenic arteries, and one smaller branch, the left gastric artery. The celiac artery and its branches supply the foregut, i.e. the stomach, spleen, pancreas, liver and part of the

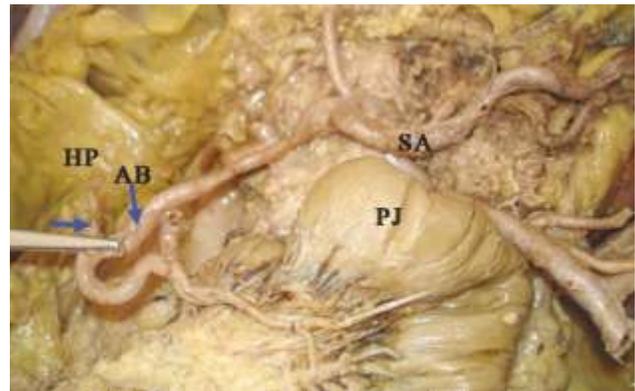
duodenum [1]. Ventral splanchnic arteries are branches of two dorsal aorta. A number of paired vitelline arteries supply the yolk sac, at the end of the 4<sup>th</sup> intrauterine life. Later, these arteries gradually fuse and form arteries in the dorsal mesentery of gut which are represented in adult life coeliac, superior and inferior mesenteric arteries [2]. Incomplete or malfusion of vitelline arteries during the development process would give rise to variations of these arteries in various forms.

Anomalies of the celiac trunk and its branches have been reported in previous studies. However, variations of the common hepatic artery (CHA) are relatively uncommon [3, 4]. While searching the literature we come across few studies on variations of origin and branching pattern of CHA. The CHA may arise directly from the abdominal aorta [5, 6], gastroduodenal artery may arise from common hepatic artery [7] and duplication of CHA also reported [8]. Usually, the vascular anomalies are asymptomatic but precise knowledge of these vascular anomalies is important in patients who are undergoing abdominal surgery or diagnostic angiography for trans-catheter therapy, gastrointestinal bleeding or prior to operative procedure [9].

**Case Report:**

During the routine dissection of the abdominal cavity of 55 years old, embalmed, male cadaver in our department, we observed an aberrant artery which was arising from the CHA before it divides into gastro-duodenal and proper hepatic artery (Fig.1). Careful dissection was carried out. The aberrant artery traversed inferiorly and behind the

body of the pancreas. It had a long and tortuous course. It was approximately 9.3 cm in length with a diameter of 0.3 cm and below the body of the pancreas; it divided into a larger right and smaller left branches (Fig.2). The right branch ran obliquely upwards for a short distance and behind the neck of the pancreas and it ended after supplying few branches to head and body of pancreas. However, the left branch had a short course and gave off branches to the proximal part of the jejunum (Fig.2). The CHA ascended laterally and it gave a gastroduodenal branch, which then descended normally between the duodenum and the neck of the pancreas. The CHA, after giving a gastroduodenal branch, continued as the hepatic artery and divided into the right and left hepatic arteries. The superior mesenteric artery had a normal course and branches. These findings were photographed with digital camera. The length and the external diameter of the aberrant artery were measured by using a Digital Vernier caliper.

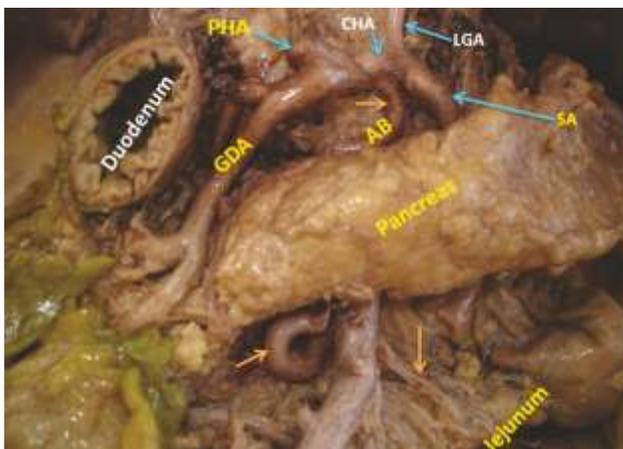


**Fig. 2: Showing an Aberrant Artery Supplying the Proximal Part of Jejunum and Head of Pancreas HP- Head of Pancreas, AB- Aberrant Artery, SA- Splenic Artery, PJ- Proximal Part of Jejunum**

**Discussion:**

Vascular variations are always interesting as they often throw light on obscure problems of phylogeny and ontogeny. Variations in the branches of coeliac trunk are due to unusual embryological development of the ventral splanchnic arteries. In the 1960, Michels *et al* [10] have first described the variations of coeliac trunk, hepatic artery. Rusu *et al* 2011 [11] have observed the anastomosis between proper hepatic artery and superior mesenteric artery by an arc of Buhler. Polguy *et al* 2010 [12] have found an accessory right hepatic artery which arose from the common hepatic artery. Saeed and Rufai 2001 [8] have reported accessory common hepatic artery (of superior mesenteric origin) co-existed with a normal common hepatic artery of coeliac origin. Ugurel *et al* 2010 [13] have studied the anatomic variations of hepatic artery, coeliac trunk and renal arteries by angiography. They reported that, left hepatic artery originated from CHA. In 2008, Wadhwa *et al* have reported an anomalous middle colic artery originated from CHA [14].

Present era is of minimal invasive surgery so the laparoscopic surgery has been frequently used for



**Fig.1: Showing an Aberrant Artery Arising From Celiac Trunk**

**PHA- Proper Hepatic Artery, CHA- Common Hepatic Artery, LGA- Left Gastric Artery, SA- Splenic Artery, AB- Aberrant Artery, GDA- Gastroduodenal Artery, Chrome Yellow Colour Arrow showing the Course of an Aberrant Artery.**

various abdominal surgeries. However, one major disadvantage of laparoscopic surgery is that, it is difficult to obtain an image of the entire lesion. Therefore intra-operative time is prolonged while dealing with the origins of vessels, as the particular anatomy can vary greatly from case to case [15]. While performing minimal invasive surgeries precise knowledge of the existing arterial variation is important in planning and conducting surgical or radiological procedures [16]. Since bleeding from aberrant vessels may increase the risk of intra-operative complications. It is essential to do pre-surgery investigations especially, Multidetector CT (MDCT) which is

the gold standard in evaluation of vascular anatomy in recent years [13].

### Conclusion:

In the present case the common hepatic artery was observed to give an aberrant branch which was supplying the pancreas and proximal part of jejunum. To our knowledge this is a unique case. Knowledge of this type of rare variation is very useful in surgical, oncologic or interventional procedures and should be kept in mind to avoid complications. We as anatomists believe that, the concomitant variations of this type are kept in mind by the surgeon, radiologist.

### References

1. Standring S, Borley NR, Collins P, Crossman AR, Gatzoulis MA, Healy J C *et al.* Gray's Anatomy: The Anatomical Basis of Clinical Practice. 40<sup>th</sup> ed., vol.1198. London Elsevier, Churchill Livingstone; 2008: 1073.
2. Sadler TW. Longman's Medical Embryology. 11<sup>th</sup> ed. Lippincott Williams & Wilkins, New Delhi, 2009:183.
3. Vandamme J P, Bonte J. The branches of celiac trunk. *Acta Anat* 1985;110-114.
4. Kadir S, Lundell C, Saeed M. Celiac, Superior and inferior mesenteric arteries. In: Kadir S, editor. Atlas of normal and variant angiographic anatomy. Philadelphia: WB Saunders, 1991: 297-308.
5. Raikos A, Paraskevas GK, Natsis K, Tzikas A, Najau SN. Multiple variations in branching pattern of abdominal aorta. *Rom J MorpholEmbryol* 2010; 51: 585-87.
6. Kara E, Celebi B, Ozturk N, Uzman D. An unusual case of a tortuous abdominal aorta with a common celiacomesentric trunk: demonstrated by angiography. *Clinics* 2011; 66: 169-71.
7. Suresh T and Sangeeta M. Variation in the branching pattern of coeliac trunk- case report. *IOSR Journal of Dental and Medical Sciences* 2013; 5: 87-89.
8. Saeed M, Rufai AA. Duplication of hepatic artery. *Saudi J Gastroenterol* 2001; 7:103-8.
9. Yalcin B, Kocabiyik N, Yazar F, Ozan H, Ozdogmus O. Variations of the branches of the celiac trunk. *Gulhane Tip Dergisi* 2004; 46: 163-65.
10. Michels NA. Variational anatomy of the hepatic, cystic, and retroduodenal arteries. *Am Med Assoc* 1953; 66: 20-34.
11. Rusu MC, Jianu AM, Sztika D, Cuzino D, Loreto C. Three extremely rare anatomic variants of the hepatic artery. *Ann Vasc Surg* 2011; 25: 1138e1-1138e7.
12. Poguj M, Gabryniak T, Topol M. The right accessory hepatic artery; a case report and review of literature. *Surg Radiol Anat* 2010; 32: 175-179.
13. Ugurel MS, Battal B, Bozlar U *et al.* Anatomical variations of hepatic arterial system, coeliac trunk and renal arteries: an analysis with multidetector C T angiography. *Br J Radiol* 2010; 83: 661-67.
14. Wadhwa S, Barua MP. Anomalous middle colic artery originating from common hepatic artery: a case report. *Clin Anat* 2008; 21: 798-99.
15. Azagra JS, Goergen M, Simone PD, Ibanez-Aguirre J. Minimally invasive surgery for gastric cancer. *Surg Endosc* 1999; 13:351-57.
16. Oran A, Yesildag A, Memis A. Aortic origin of right hepatic artery and superior mesenteric origin of splenic artery two rare variations demonstrated angiographically. *Surg Rad Anat* 2001; 23:349-52.

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