

What is in a name? Gastro-Duodenal Artery or Gastro-Duodeno-Pancreatic Trunk

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Anatomy

Gastro-duodenal artery (GDA) arises from the common hepatic artery (CHA) which, in turn, is one of the three branches of the celiac trunk; after giving off GDA, CHA continues as proper hepatic artery (PHA) in the hepato-duodenal ligament.

The first branch of GDA is supraduodenal (retroduodenal) artery. GDA then passes behind (posterior to) the first of duodenum and gives off posterior superior pancreato-duodenal artery (PSPDA) after which it divides into anterior superior pancreato-duodenal artery (ASPDA) and right gastro-epiploic artery (RGEA). Sometimes, GDA divides into a common SPDA (which then divides into ASPDA and PSPDA) and RGEA. An infrapyloric artery may also be given. Rarely, the cystic artery may arise from GDA. GDA supplies the CBD also [1].

ASPDA and PSPDA form anterior and posterior pancreato-duodenal arcades with anterior inferior pancreato-duodenal artery (AIPDA) and posterior inferior pancreato-duodenal artery (PIPDA), which are branches of superior mesenteric artery (SMA). These arcades are thus collateral pathways between celiac trunk and SMA.

GDA supplies the greater curvature of the stomach (through RGEA), pylorus (through infrapyloric artery) and (first part) duodenum (through supra duodenal artery), second part of duodenum (C loop) and head of pancreas (through PSPDA and ASPDA) and omentum (through RGEA).

GDA is an artery not accompanied by a vein.

Clinical Importance

A peptic ulcer on the posterior wall of the first part of the duodenum (duodenal bulb) may erode into GDA which lies behind and cause massive upper GI bleed (hematemesis and melena). This bleed is usually controlled endoscopically using adrenaline, sclerosants, clips, etc. [2]. Endoscopic failures can be treated with angio-embolization of GDA [3] or surgically [4].

In celiac trunk stenosis, increased amount of blood flows from SMA through AIPDA, PIPDA, pancreato-duodenal arcades and ASPDA and PSPDA and GDA to PHA which may result in a true aneurysm of the GDA.

A pseudoaneurysm can form in the GDA following an attack of acute pancreatitis, in chronic pancreatitis and as a complication of pancreato-duodenectomy. Ruptured GDA pseudo aneurysm causes massive intra-abdominal bleed and can be fatal. It can be diagnosed on CT angiography. Treatment of choice for GDA pseudo aneurysm is angio-embolization. Pseudo aneurysm following acute pancreatitis and in chronic pancreatitis requires embolization both above and below the aneurysm because of the collateral circulation through pancreato-

duodenal arcades. GDA pseudo aneurysm after PD can be embolized from the hepatic artery side only as the other end has been disconnected during operation. If an adequate GDA stump is not available, embolization may occlude PHA – a covered vascular stent is required in such cases [5].

GDA can be used for cannulation of PHA for embolization of liver lesions e.g. Tumors.

Discussion

Arteries are named in various ways viz, based on their anatomical location e.g. axillary, brachial, femoral, popliteal, subclavian, etc.; the organ they supply e.g. bronchial, gastric, hepatic, renal, splenic; organ they are related to e.g. vertebral (passes through transverse processes of vertebra). Some arteries have dual names e.g. Gastro-epiploic. There are arterial arches e.g. Palmar and arcades e.g. Pancreato-duodenal.

An arterial trunk is one which gives rise to multiple arteries e.g. celiac trunk giving rise to common hepatic, splenic and left gastric arteries; supra aortic great arterial trunk i.e. brachio-cephalic trunk which gives rise to right subclavian and right common carotid arteries. Even veins have been named trunks e.g. Gastrocolic trunk which drains tributaries from right colic, middle colic, right gastro-epiploic veins and ASPDV.

Conclusion

GDA is a small but clinically important artery; it supplies blood to stomach, duodenum and pancreas (and omentum) through its multiple branches. It is of importance in many diseases and operations.

It is proposed that, in order to give it its due importance, the GDA should be renamed and called gastro-duodeno-pancreatic (GDP) trunk.

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