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Case Report

AN UNUSUAL PANCREATIC ARTERIAL PATTERN: A CASE REPORT

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ABSTRACT

Back ground: Pancreas is an important digestive gland in our body with wide range of both exocrine and endocrine functions. Pancreas has a rich vascular supply from the celiac axis and superior mesenteric artery. The superior pancreatico-duodenal artery (from gastro-duodenal artery) and the inferior pancreatico-duodenal artery (from superior mesenteric artery) runs in the groove between the pancreas and the duodenum to supply the head of pancreas. Pancreas also derives its blood supply from splenic artery which supplies its head, body and tail region. Profuse vascular supply makes it prone for haemorrhage and that may be the reason that pancreatic blood supply has always been an area of constant interest. In depth knowledge of the variations of blood vessels in this region is utmost important for the successful accomplishment of complex surgical procedures like resection of head of pancreas. The present case report brings in light abnormal pattern of vascularisation in the head region of pancreas and an unusual pancreatic branch from the junction of superior and inferior pancreatic arteries.

KEY WORDS: SUPERIOR PANCREATICO-DUODENAL ARTERY; GASTRO-EPIPLOIC ARTERY; PANCREATIC ARTERIAL PATTERN; INFERIOR PANCREATICO-DUODENAL ARTERY.

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INTRODUCTION

Pancreas is largest of the digestive gland that performs a wide range of both endocrine and exocrine functions. It has a rich arterial supply derived from the branches of celiac axis and superior mesenteric artery. An arterial arcade formed by superior and inferior pancreatico-duodenal arteries in the region of duodenum (2nd part) and head of pancreas makes this region highly vascular. The superior pancreatico-duodenal artery is normally double in number. The anterior artery descends in the anterior groove between the second part of the duodenum and head of the pancreas supplying head of the pancreas and anastomoses with the anterior division of the inferior pancreatico-duodenal artery. The posterior artery runs posterior to the head of the pancreas and anastomoses with the posterior division of the inferior pancreatico-duodenal artery. The inferior pancreatico-duodenal artery arises from the superior mesenteric artery near the superior border of the third part of the duodenum where it usually divides directly into anterior and posterior branches. Both branches along with superior pancreatico-duodenal artery supply the pancreatic head, its uncinate process and the second and third parts of the duodenum. A separate dorsal branch also supplies pancreas which lies on its posterior aspect, dividing into right and left branches. It sometimes arises from the superior mesenteric, middle colic, hepatic or rarely, the celiac artery. Apart from these major arteries, the pancreas is normally supplied by numerous small arterial branches which directly run into the gland. These arteries are mainly the branches from the splenic artery or from the first jejunal arcade of the superior mesenteric artery

and the arterial branches of the retroperitoneal vessels. The extensive vascular supply requires careful haemostasis.These arteries may bleed profusely on cutting the parenchyma of the gland during resection and usually require ligation [1, 2]. Complete familiarity with the variations in vascular arrangement in this part is utmost important for the successful accomplishment of the surgical procedures especially those involving resection of head and neck of pancreas. This case report is an endeavour to describe a unique variation in the arterial pattern of pancreas.

CASE REPORT

In the present case study a peculiar pattern of arterial supply to pancreas was seen. Anterior and posterior branches of the superior pancreatico-duodenal arteries after arising from the gastro-duodenal artery ran on the posterior aspect of the groove between second part of duodenum and pancreas. The arterial branch on the anterior groove between pancreas and 2nd part of duodenum was the continuation of right gastro-epiploic artery. The inferior pancreatico-duodenal artery arose directly from the superior mesenteric artery as two independent branches. An unusual pancreatic branch arose at the site of anastomosis of right gastro-epiploic and inferior pancreatico-duodenal arteries, which first ran along the inferior border of pancreas and then subsequently ran on its posterior aspect till the tail region. [Fig1,2]

DISCUSSION

Pancreas has a rich vascular supply from the celiac axis and superior mesenteric artery [1]. One of the important complications during any pancreatic surgeries that removes or transplant any portion of pancreas is related to its extensive arterial supply. It can result in profuse bleeding as a result of inadequate control of principle arteries and subsequent ischemia of the remaining portion of preserved pancreas when the blood supply has been inadvertently interrupted [3].

Pancreatic blood supply has always been an area of constant interest. Several researchers have worked to identify its vascularity [4-6].

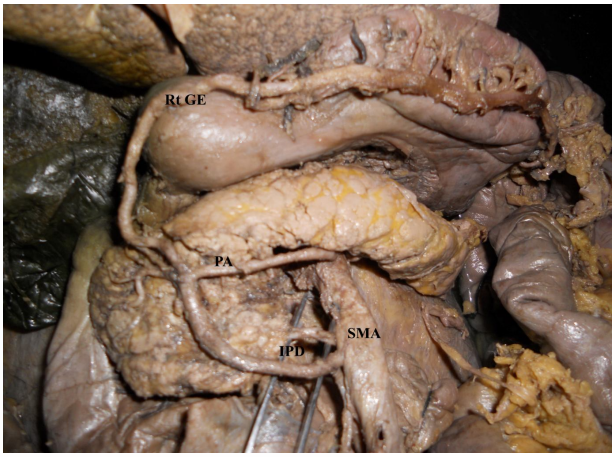

Fig 1: Photograph showing arterial pattern around head of pancreas.

(Rt GE- Right Gastro-epiploic artery (continued down in place of anterior branch of superior Pancreatico-dudenal artery), **PA-** Pancreatic artery originating from the junction of inferior pancreatico-duodenal and Right GE, **SMA-** Superior mesenteric artery, IPD- Inferior pancreatico-duodenal artery).

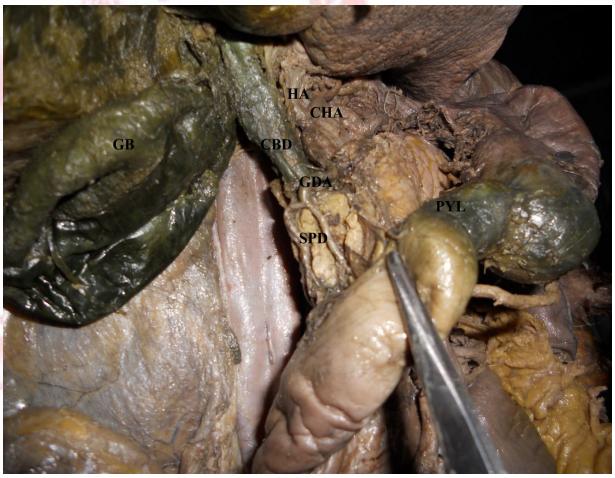

Fig 2: photograph showing both the divisions of superior pancreatico-duodenal artery on the posterior aspect.

(**CBD**- common bile duct, **CHA**- common hepatic artery, **GB**- gall bladder, **GDA**- gastro-duodenal artery, **HA**- hepatic artery, **PYL**- pylorus of stomach, **SPD**- superior pancreatico-duodenal artery.)

Wharton studied the development of vascularity in pancreas by studying serial sections of mouse, rat and human embryo. Further his work focused on the larger vessels and their relations to pancreas by gross dissection and using celluloid corrosion method [7]. Pierson also conducted dissection on 50 specimens and reviewed the arterial supply of pancreas.

Profuse arterial and venous supply makes pancreas prone to haemorrhage. The presence of unusual artery to pancreas from the junction of right gastro-epiploic artery and anterior inferior

pancreatico-duodenal branch in the present case study is quite significant. Its wide calibre clearly denotes its importance in maintaining its blood supply to the pancreas. Familiarity with such variations is of immense importance to the surgeons for the success of various procedures like resection of head of pancreas.

CONCLUSION

Pancreas is an important digestive gland with an extensive vascularity. Any variation in its blood supply can be a potential reason behind torrential haemorrhage. One such variation has been reported in this study where a large pancreatic branch arose from the junction of inferior pancreatico-duodenal and right gastro-epiploic artery, which brings a new insight to the pancreatic vascular pattern.

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