

Variational & branching pattern study of Inferior pancreaticoduodenal artery with its clinical aspect in blood supply of pancreas

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Abstract

Background: Pancreas is a largest digestive gland, which is supplied by many arteries and arcades giving the gland rich blood supply. These arteries show wide variation. Inferior pancreaticoduodenal artery, arising from superior mesenteric artery; serves major role in supplying lower part of head of pancreas. **Aims and objectives:** The study was carried out to study the pancreatic arterial anatomy, to find out the variation in arterial supply of head of pancreas, to compare the findings with available literature and establish a data record for this region. **Materials and methods:** The study was carried out on 50 specimens of pancreas by gross dissection and the origin, length, branches and termination of arteries were noted. **Results:** All the arteries supplying pancreas were seen to have a variable origin, length and termination. All arteries with their parameters were studied and compared with available literature.

Key words: Pancreas, inferior pancreaticoduodenal artery, branches, variation

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Introduction

Pancreas is an organ that develops at the boundary between foregut and midgut. The area of foregut is supplied by the celiac trunk and the midgut by superior mesenteric artery. This explains the description of classical anatomy of the area that the blood supply of second part of duodenum and the head of pancreas originates from several arteries that spring from the celiac axis and the superior mesenteric artery. The pancreaticoduodenal arcades which are located anterior and posterior to the pancreatic head, are major source of blood supply of pancreatic head and the second part of the duodenum.

The methods used for study were dissection on cadavers, corrosion cast studies, radiological studies using contrast media and the latest imaging techniques such as MR(Magnetic Resonance) angiography and Digital Subtraction Angiography, scanning electron microscopy etc.¹ 'vascular variation is part and parcel of the pancreatic vascular anatomy'. The most accepted and reliable method continues to be the method of dissection in cadavers. Inferior pancreaticoduodenal artery is a branch of superior mesenteric artery which in turn branch of abdominal aorta. It leaves the superior mesenteric artery, near the superior border of the horizontal part of duodenum, usually dividing at once into anterior and posterior

branches. The anterior branch passes to the right, anterior to the head of the pancreas, and ascends to anastomose with the anterior superior pancreaticoduodenal artery. The posterior branch ascends to the right, posterior to the head of the pancreas, which it sometimes traverses, and then anastomoses with the posterior superior pancreaticoduodenal artery. Both branches supply the pancreatic head, its uncinete process and adjoining duodenum.²

Taking into consideration the normal anatomy; this study was conducted on inferior pancreaticoduodenal artery to find out its branches and variations as very few Indian studies have reported this.

Pancreatic surgeries are more dangerous as these arteries are direct sources from abdominal aorta, chances of bleeding are more and can turn fatal too. So having the knowledge of variations in this artery is definitely helpful to surgeons.

Observations

Inferior pancreaticoduodenal artery and its branches were studied in detail. The major heads for the study were origin, course and extent, termination and organs / parts of organs under supply. The data was obtained, compiled and subjected to statistical analysis for comparison with available literature.

Inferior pancreaticoduodenal artery (IPDA): This artery was present in 84% and absent in 16%.

Origin: Origin of the artery was variable one as detailed in the following table 1 (figure 1).

Table 1: Details of origin of Inferior Pancreaticoduodenal Artery.

Origin	Number	Percentage
Superior mesenteric artery (SMA)	39/50	78%
Jejunal branch of superior mesenteric artery (SMA)	2/50	4%
Duodenal branch of superior mesenteric artery (SMA)	1/50	2%
Absent	8/50	16%
Total	50	100%

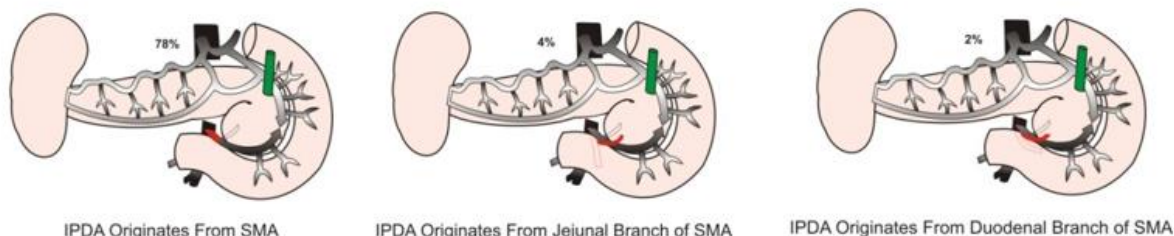
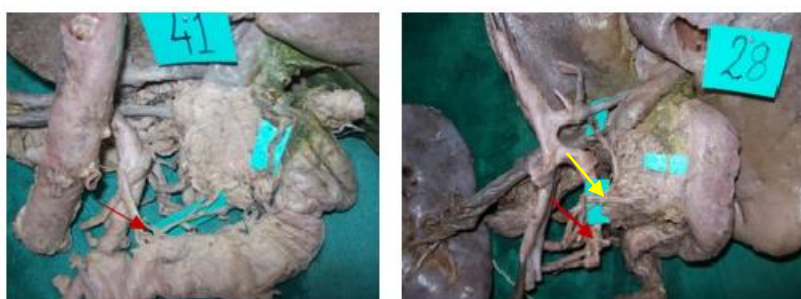


Figure 1: Showing origin of Inferior Pancreaticoduodenal Artery



Photograph 1: IPDA from jejunal branch of SMA; Photograph 2: IPDA from duodenal branch of SMA

Length: Average Length = 1.4 cm; Range = 0.5 - 4.5 cm.

Termination: The artery ends in anterior inferior pancreaticoduodenal artery, posterior inferior pancreaticoduodenal artery and a duodenal branch in 74%, in anterior inferior pancreaticoduodenal artery and a duodenal branch in 8%, in anterior inferior pancreaticoduodenal artery and a jejunal branch in 2%, and is absent in 16% (figure 2).

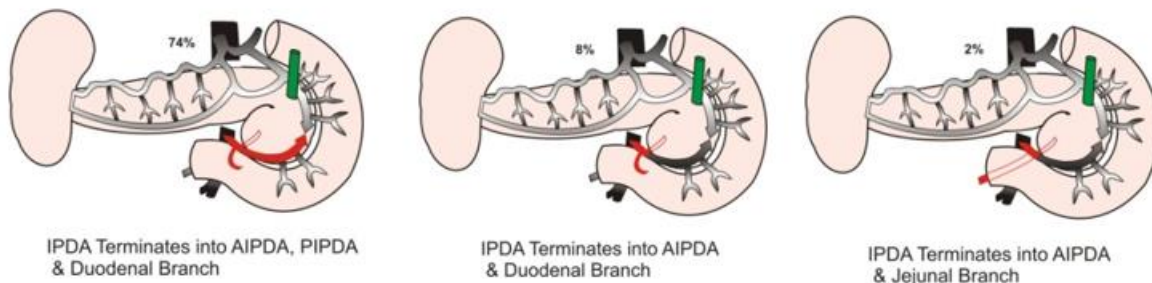


Figure 2: Termination of Inferior Pancreaticoduodenal Artery

Aberrant accessory inferior pancreaticoduodenal artery (IPDA): In two specimens aberrant accessory inferior pancreaticoduodenal artery was present. In one it gives anterior inferior pancreaticoduodenal artery and a duodenal branch and in another it gives a duodenal branch and branch to posterior part of head of pancreas (Figure 3 and Photograph 3).

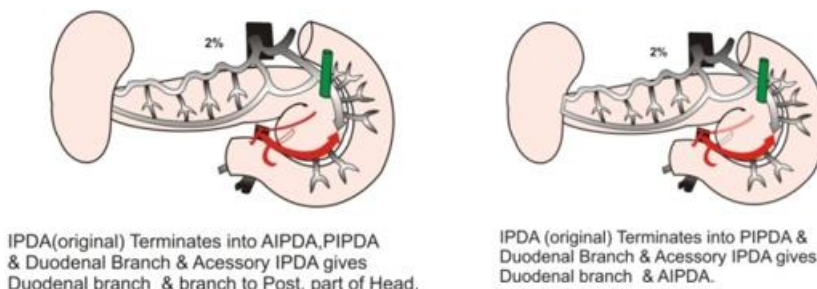


Figure 3: Aberrant Accessory Inferior Pancreaticoduodenal Artery



Photograph 3

Organs / parts under supply: Head and uncinete process of pancreas, duodenum (second and third part).

1. Anterior Inferior Pancreaticoduodenal Artery (AIPDA): The artery was present in 96% specimens (48/50) and absent in 4% (2/50) specimens.

Origin: There were number of sources of origin for this artery as shown in table 2 (Figure 4).

Table 2: Details of origin of Anterior Inferior Pancreaticoduodenal Artery

Origin	Number	Percentage
Inferior pancreaticoduodenal artery (IPDA)	41/50	82%
Superior mesenteric artery (SMA)	4/50	8%

Aberrant right hepatic artery(RHA)	1/50	2%
Accessory inferior pancreaticoduodenal artery (IPDA)	1/50	2%
Right branch of dorsal pancreatic artery (Rt.DPA)	1/50	2%
Absent	2/50	4%
Total	50	100%

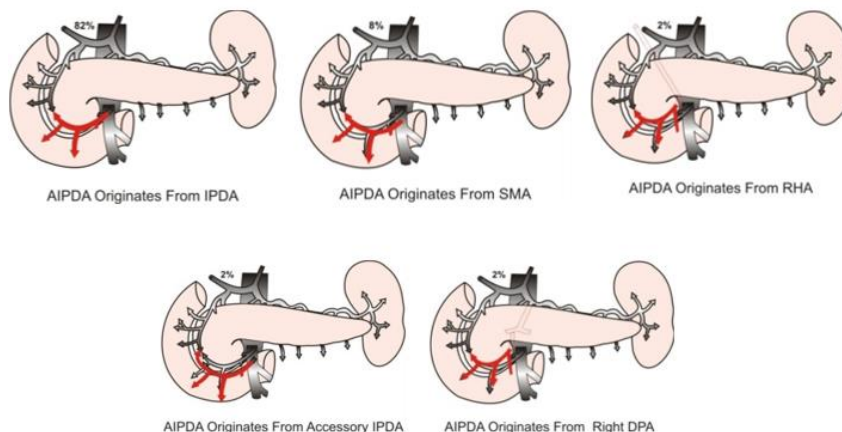


Figure 4: Origins of Anterior Inferior Pancreaticoduodenal Artery

Length: Average length = 4.5cm; Range =2.3 - 7.5cm.

Termination: The artery terminates with anterior superior pancreaticoduodenal artery in 92%, in uncinete process of pancreas anteriorly in 2%, with anterior superior pancreaticoduodenal artery and posterior superior pancreaticoduodenal artery in 2%, and absent in 4% (Figure 5).

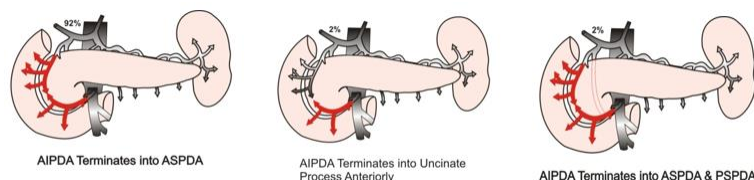


Figure 5: Termination of Anterior Inferior Pancreaticoduodenal Artery.

Organs / parts under supply: Head and uncinete process of the pancreas, duodenum (second and third part).

2. Posterior Inferior Pancreaticoduodenal Artery (PIPDA):

This artery was present in 94% specimens and absent in 6%.

Origin: The artery originated from different sources as shown in table 3(Figure 6).

Table 3: Showing origin of Posterior Inferior Pancreaticoduodenal Artery

Origin	Number	Percentage
Inferior pancreaticoduodenal artery (IPDA)	38/50	76%
Superior mesenteric artery (SMA)	5/50	10%
Right hepatic artery (RHA)	2/50	4%
Splenic artery (SA)	1/50	2%
Extra branch of celiac trunk	1/50	2%
Absent	3/50	6%
Total	50	100%

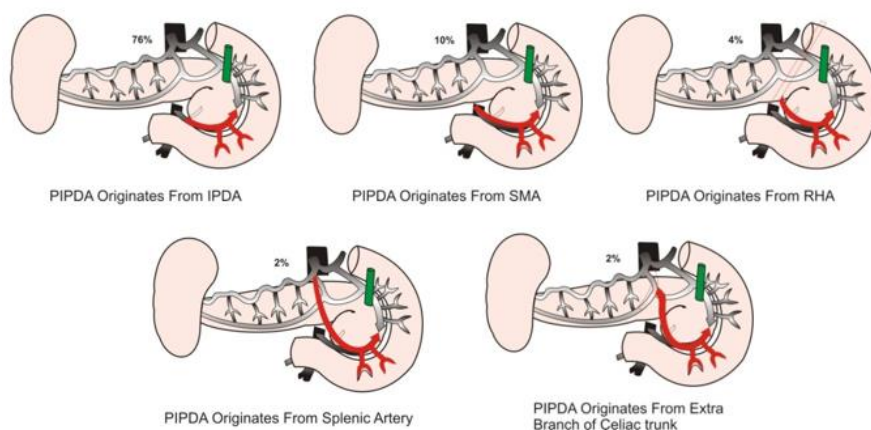


Figure 6: Origin of Posterior Inferior Pancreaticoduodenal Artery

Length: Average Length = 3.7 cm; Range =1.7 - 5.8 cm

Termination: This artery terminates with posterior superior pancreaticoduodenal artery in 84%, with posterior superior pancreaticoduodenal artery and anterior inferior pancreaticoduodenal artery in 4%, with posterior superior pancreaticoduodenal artery and anterior superior pancreaticoduodenal artery in 2%, with posterior superior pancreaticoduodenal artery and additional branch from superior mesenteric artery in 2%, with right branch of dorsal pancreatic artery in 2%, and absent in 6%(Figure 7)

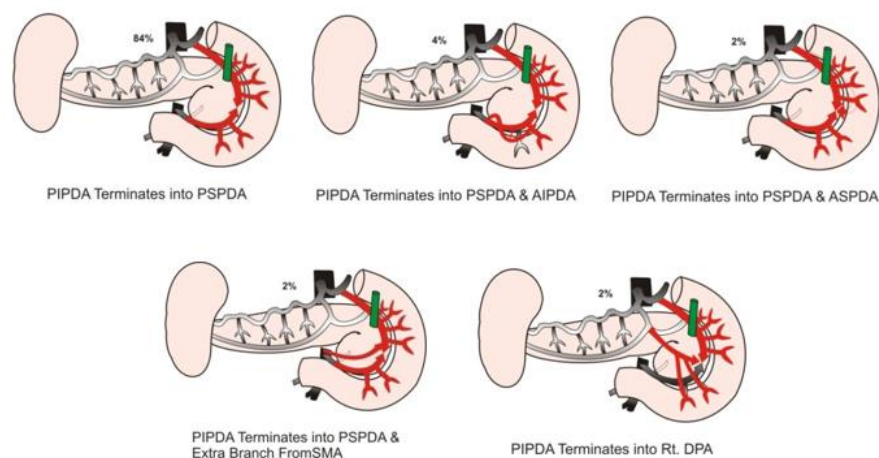


Figure 7: Termination of Posterior Inferior Pancreaticoduodenal artery

Organs/parts under supply: Head, neck and uncinate process of the pancreas, duodenum (second and third part).

3. Anterior Pancreaticoduodenal Arcade (APAr): Two major arterial arcades were identified i.e. anterior and posterior. Anterior arcade is formed by anterior superior pancreaticoduodenal and anterior inferior pancreaticoduodenal arteries and posterior arcade is formed by posterior superior pancreaticoduodenal and posterior inferior pancreaticoduodenal arteries, mostly. Anterior arcade was present in 98% (49/50) specimens and absent in 2%. Arteries of origin are shown in table 4 (Figure 8).

Table 4: Showing origin of Anterior Pancreaticoduodenal Arcade

Origin	Number	Percentage
Anterior superior pancreaticoduodenal artery (ASPDA) and Anterior inferior pancreaticoduodenal artery (AIPDA)	46/50	92%
Anterior superior pancreaticoduodenal artery (ASPDA), Anterior inferior pancreaticoduodenal artery (AIPDA) and Right dorsal pancreatic artery (Rt.DPA)	1/50	2%
Anterior superior pancreaticoduodenal artery (ASPDA) only	1/50	2%
Anterior superior pancreaticoduodenal artery (ASPDA) and Posterior inferior pancreaticoduodenal artery (PIPDA)	1/50	2%
Arcade absent and Anterior superior pancreaticoduodenal artery (ASPDA) gives branches	1/50	2%
Total	50	100%

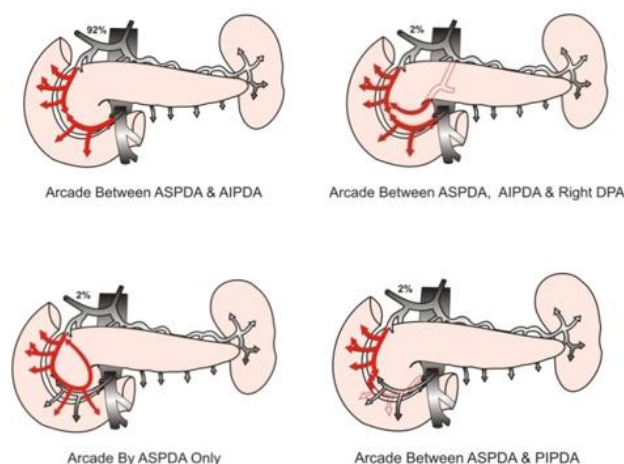


Figure 8: Showing arteries of origin for Anterior Pancreaticoduodenal Arcade



Photograph 4: Arcade by ASPDA only Photograph 5: Arcade between ASPDA & PIPDA

Distance of arcade from duodenum: The distance of arcade from duodenum ranged from 0(at pancreaticoduodenal junction) to 3 cm with mean 0.54 and standard deviation of 0.68.

In 20 specimens the arcade was hidden by pancreatic tissue (40%).

Number of Arcade: In all specimens only single arcades were found.

Number of branches by arcade: Average number =8; Range =6 - 10

4. Posterior pancreaticoduodenal arcade (PPAr):

This arcade was present in 98% and absent in 2% specimens. Arteries of origin are shown in table 5 (Figure 9).

Table 5: Showing origin of Posterior Pancreaticoduodenal Arcade

Origin	Number	Percentage
Posterior superior pancreaticoduodenal artery (PSPDA) and Posterior inferior pancreaticoduodenal artery (PIPDA)	43/50	86%
Posterior superior pancreaticoduodenal artery (PSPDA), Posterior inferior pancreaticoduodenal artery (PIPDA) and extra branch from superior mesenteric artery (SMA)	2/50	4%
Posterior superior pancreaticoduodenal artery (PSPDA), Posterior inferior pancreaticoduodenal artery (PIPDA) and extra branch from abdominal aorta (AA)	1/50	2%
Posterior superior pancreaticoduodenal artery (PSPDA) only	1/50	2%
Anterior inferior pancreaticoduodenal artery (AIPDA) and Posterior superior pancreaticoduodenal artery (PSPDA)	1/50	2%
Arcade absent and Right hepatic artery (RHA) gives branches	1/50	2%
Posterior superior pancreaticoduodenal artery (PSPDA), Posterior inferior pancreaticoduodenal artery (PIPDA) and Anterior inferior pancreaticoduodenal artery (AIPDA)	1/50	2%
Total	50	100%

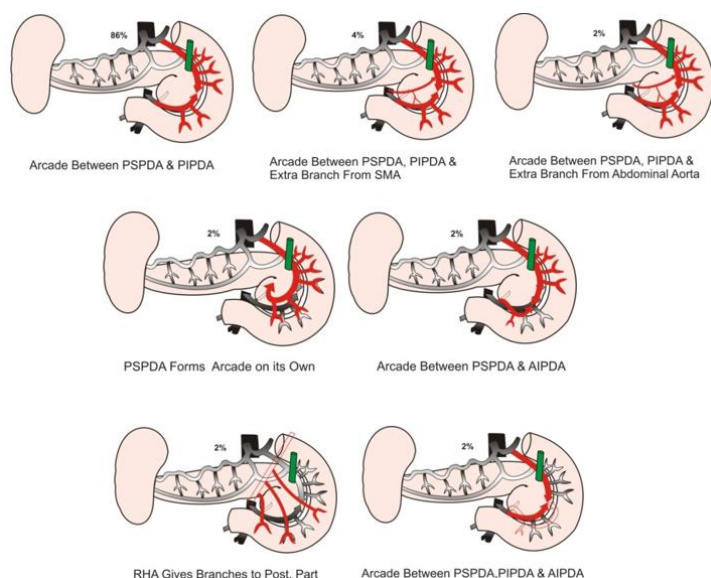
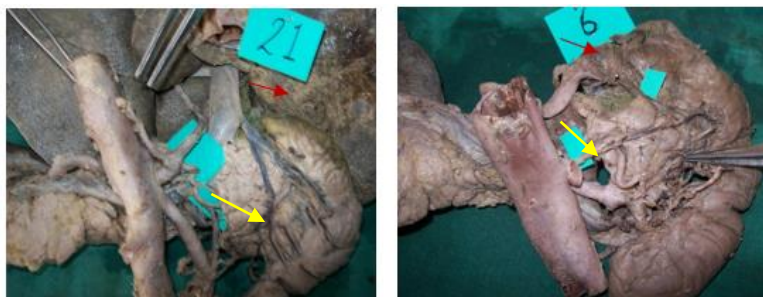


Figure 9: Showing arteries of origin for Posterior Pancreaticoduodenal Arcade



Photograph 6: Arcade by PSPDA alone; Photograph 7: Arcade between PSPDA, PIPDA & branch from aorta

Distance from duodenum-The distance of arcade from duodenum ranged from 0 (at pancreaticoduodenal junction) to 2.9 cm, with a mean 1.36 and standard deviation of 0.52. There was a statistically significant difference (p value < 0.05) between the mean distance of anterior arcade and mean distance of posterior arcade from pancreaticoduodenal junction.

Number of arcades - arcade was single in all cases.

Number of branches by arcade: Average number = 7; Range = 6 – 10

Discussion

Pancreas is an organ involved in the highest degree of specialized secretory activity. This specialization is found in endocrine as well as exocrine function. This activity is brought by virtue of its abundant blood supply both in terms of the amount of blood it receives and the number of branches it receives from three different sources. The number of sources in addition to networking of the vessels in the form of arcades and collateral circulation provide a guaranty against blood flow obstruction that is functional or physiological in nature. In our study we found additional sources of blood supply apart from those that normally supply pancreas, but we did not come across a single instance of absence of one of the three primary sources, neither in our study nor in the literature that we reviewed.

The arterial blood supply of the pancreas is provided mainly by the celiac and superior mesenteric arteries. Splenic artery is functionally more important source because it supplies maximum portion of the pancreatic tissue, whereas common hepatic artery is surgically more important since the number of variations affecting its area of supply are many more. From these arteries and/or from their major branches, eight main arteries arise with various patterns of origin and supply the pancreas. Many arrangements are possible due to the variations in number, incidence, sites of origin and, sometimes, even course of pancreatic arteries. This marked irregularity, particularly in the distal segment of the pancreas (body/tail), leads to difficulty in interpreting the patterns of arterial vascularization and to strikingly divergent statistical analyses.

Arterial supply to Head of pancreas

The head of the pancreas receives blood mainly from the hepatic artery, via the gastroduodenal artery, and from the superior mesenteric artery via the inferior pancreaticoduodenal artery. The gastroduodenal artery supplies the posterior superior pancreaticoduodenal and the anterior superior pancreaticoduodenal arteries to the head of the pancreas. The inferior pancreaticoduodenal artery divides into the posterior inferior pancreaticoduodenal and the anterior inferior pancreaticoduodenal arteries, which anastomose with the posterior superior pancreaticoduodenal and the anterior superior pancreaticoduodenal arteries respectively, forming two pancreaticoduodenal arcades, namely the anterior and the posterior pancreaticoduodenal arcades.

Inferior Pancreaticoduodenal Artery (IPDA): The anterior inferior pancreaticoduodenal and the posterior inferior pancreaticoduodenal arteries originate from the bifurcation of the inferior pancreaticoduodenal artery in 60-70% cases. The inferior pancreaticoduodenal artery arises directly from the superior mesenteric artery as its first right collateral branch. When an accessory right hepatic artery is present, the inferior pancreaticoduodenal artery is the second right collateral branch reported with incidence of 4-47%. The level at which the inferior pancreaticoduodenal artery arises from the superior mesenteric artery is variable, corresponding more frequently to the inferior edge of the neck of the pancreas. In some cases, the inferior pancreaticoduodenal artery arises through a common trunk with the first jejunal artery, which is referred to as the pancreaticoduodenojejunal trunk. The course of the first portion of the inferior pancreaticoduodenal artery varies according to the site of origin. It runs downward when arising behind the pancreas. When arising through common trunks with the jejunal arteries, it goes transversely from left to right, crossing the superior mesenteric artery posteriorly. Regardless of its origination, the inferior pancreaticoduodenal artery crosses behind the superior mesenteric vein and is in contact with the posterior face of the uncinata process, where it divides into the anterior inferior pancreaticoduodenal and the posterior inferior pancreaticoduodenal arteries.³

Presence of the artery reported as 84% in our study is higher than Oslen LL et al⁴ (68%). Origin of artery from superior mesenteric artery and upper jejunal branch of superior mesenteric artery in this study as 78% and 4% shows wide difference with Oslen LL et al⁴ i.e. 46% and 22% respectively. Presence of an aberrant accessory inferior pancreaticoduodenal artery unreported till date was found in two cases of this study.

Anterior Inferior Pancreaticoduodenal Artery (AIPDA): This artery is usually the smallest of the pancreaticoduodenal arteries. It is almost always constant. The anterior inferior pancreaticoduodenal artery usually runs behind the uncinata process, but it may be prepancreatic, subpancreatic, or even intrapancreatic. In 90% of cases, it ends by anastomosing with the anterior superior pancreaticoduodenal artery.³ Presence was noted as 96% in our study, 100% by Oslen LL et al⁴, 93.3% by Thomford NR et al.⁵ In the majority of cases, the anterior inferior pancreaticoduodenal artery arises from the division of the inferior pancreaticoduodenal artery. Sources of origin varied considerably in different studies as is seen in the following table.

Table 6: Distribution of origin of Anterior Inferior Pancreaticoduodenal Artery

Origin	Present study	Oslen LL et al	Thomford NR et al
With posterior inferior pancreaticoduodenal artery (PIPDA)	82%	68%	50%
Directly from superior mesenteric artery (SMA)	8%	16%	-
From aberrant right hepatic artery (RHA)	2%	0.7%	3.3%
From accessory inferior pancreaticoduodenal artery (IPDA)	2%	-	-
From right dorsal pancreatic artery (Rt.DPA)	2%	0.7%	-
From upper jejunal branch of superior mesenteric artery (SMA)	-	14.6%	39.6%
Absent	4%	-	6.7%

Origin from superior mesenteric artery as 5-16% is reported by Skandalakis et al.³ Anterior inferior pancreaticoduodenal artery in all cases supplies the pancreatic head, its uncinate process, and second and third parts of the duodenum which is similar to standard description by Susan S et al.²

Posterior Inferior Pancreaticoduodenal Artery (PIPDA): This artery is an almost constant artery which originates mainly from the inferior pancreaticoduodenal artery. Its presence was noted as 94% in our study, 99.6% by Oslen LL et al¹⁶, and 90% by Thomford NR et al.⁵ Comparison of origin of this artery from different sources present a picture as detailed in following table.

Table 7: Distribution of origin of Posterior Inferior Pancreaticoduodenal Artery

Origin	Present study	Oslen LL et al	Thomford NR et al
Inferior pancreaticoduodenal artery (IPDA)	76%	68%	56.66%
Directly from superior mesenteric artery (SMA)	10%	15.5%	-
Splenic artery (SA)	2%	-	-
Aberrant right hepatic artery (RHA)	4%	2.7%	3%
Extra branch from celiac trunk (CT)	2%	-	-
Upper jejunal artery	-	7.4%	30%
Dorsal pancreatic artery (DPA)	-	6%	-
Absent	6%	0.4%	10%

Origin directly from superior mesenteric artery (8-25%), accessory right hepatic artery (2-7%), dorsal pancreatic artery (2-8%) was reported by Skandalakis et al.³ The course of the posterior inferior pancreaticoduodenal artery is generally short and parallel to the anterior inferior pancreaticoduodenal artery. It supplies the pancreatic head, its uncinate process and the second and third parts of the duodenum; as described similarly by Susan S et al.²

Anterior Pancreaticoduodenal Arcade (APAr): An arcade of an artery supplying branches to anterior surface of both duodenum and head of pancreas is present in 98% cases in this study; same was present in all cases studied by Kimura W et al.⁶ A variable origins of source arteries forming anterior pancreaticoduodenal arcade was found in present study. In 92% cases this arcade is formed by anterior superior pancreaticoduodenal artery and anterior inferior pancreaticoduodenal artery; whereas same is noted in all cases studied by Kimura W et al.⁶

In 40% cases the lower 2/3rd arcade was found to be partly embedded within pancreatic tissue; this occurrence finds no mention anywhere in the available literature. On an average we found eight branches arising from anterior arcade supplying only the duodenum. Smaller delicate branches arising from the arcade sunk directly into substance of pancreas (Photograph 8).



Photograph 8: Anterior arcade embedded within pancreatic tissue.

Posterior Pancreaticoduodenal Arcade (PPAr): Another arcade artery supplying posterior surface of duodenum and pancreas is present in 98% of cases in this study, in all the cases studied by Michel NA et al⁷, and 88% of cases studied by Kimura W et al.⁶

Variable origin of the two source arteries for arcade was noted in this study; arcade formation by posterior superior pancreaticoduodenal artery and posterior inferior pancreaticoduodenal artery was seen in 86% cases. Similar combination is seen in 78% by Van Damme et al⁸, and in 88% cases studied by Kimura W et al.⁶ Location of this arcade was farther away from duodenum as compared to anterior arcade. On an average we found seven branches arising from posterior arcade supplying duodenum (2nd part) along with common bile duct. Smaller delicate branches arising from the arcade sunk into posterior surface of head of pancreas

An incidental finding of common origin of inferior pancreaticoduodenal artery and jejunal branch of superior mesenteric artery is seen in 6% cases, David E et al⁹ reported such an occurrence in a case report and also shown as 20-64% by Skandalakis et al.³

Knowledge of variations of upper abdominal arteries is important while dealing with gastric and duodenal ulcers, biliary tract surgeries and mobilization of the head of the pancreas, as bleeding is one of the complications of these surgeries. During pancreaticoduodenectomies or lymph node resection procedures, ligation of inferior pancreaticoduodenal artery also requires special attention, because of the high incidence of common trunk formation of the first jejunal and inferior pancreaticoduodenal arteries. Efficacy of Kirk's arcade as a collateral pathway needs to be evaluated along with that of the cephalic pancreaticoduodenal arcades in surgeries of pancreas or liver.⁹ Michel NA et al¹⁰ has cited 26 possible collateral pathways of blood supply to the liver. These are possible and at best probable routes that should not be relied upon two heavily when a replaced hepatic artery is damaged.^{11,12}

There are anastomoses at all levels of pancreas. This extensive arterial network of the pancreas is an important source of collateral blood supply in cases of occlusion of celiac axis, superior mesenteric or splenic arteries. The existence of individual differences, development of arterial-arterial anastomosis asks for obligatory preoperative supraseductive angiography which enables insight into distribution of blood vessels.¹³

In the early embryo the vasculature of the gastrointestinal system is a meshwork of vessels and channels, first formed in the blood islands of the yolk sac. As specific vessels develop to serve the various gastrointestinal parts more adequately, other less essential channels disappear and only the distant ends of the larger channels remain as a meshwork of smaller vessels.⁴ It is into this meshwork of vessels the pancreatic buds sprout from two opposite sides i.e. dorsal and ventral of the second part of duodenum

Dorsal bud sprouts and enlarges on the left side of network of vessels in the dorsal mesentery of duodenum. Hence after rotation and fixation of the duodenal loop the blood vessels for body and tail of pancreas are seen to be located on posterior surface only.

Summary And Conclusion

All the branches of inferior pancreaticoduodenal artery supplying different parts of pancreas were studied with respect to their origin, termination, length, and parts of pancreas supplied. We found that pancreas is an organ that lies in three peripancreatic interlocking arterial circles with varying degree of variations often making it difficult to differentiate and classify normal, variant and anomalous.

Following were the variations found by us that were not reported by any other author.

1. Presence of an aberrant accessory inferior pancreaticoduodenal artery in 4% cases and an aberrant accessory posterior superior pancreaticoduodenal artery in 2% cases.
2. Origin of anterior inferior pancreaticoduodenal artery from accessory inferior pancreaticoduodenal artery was present in 2% cases.
3. Origin of posterior inferior pancreaticoduodenal artery from splenic artery in 2% cases and from extra branch of celiac trunk in 2% cases.
4. Anterior arcade was formed by anterior superior pancreaticoduodenal artery on its own in 4% cases; by anterior superior pancreaticoduodenal artery and posterior inferior pancreaticoduodenal artery in 2% cases; by anterior superior pancreaticoduodenal artery, posterior superior pancreaticoduodenal artery and right branch of dorsal pancreatic artery in 2% cases. It was found to be absent in 2% cases. A finding of significant surgical importance which no other study made a mention of was location of this arcade buried within pancreatic tissue in 40% cases.
5. Posterior arcade was formed by posterior superior pancreaticoduodenal artery on its own in 2% cases; by anterior inferior pancreaticoduodenal artery and posterior superior pancreaticoduodenal artery in 2% cases. It was found to be absent in 2% cases. Distance of posterior arcade from duodenojejunal junction was found to be significantly more than the distance of anterior arcade, most probably is due to presence of common bile duct between posterior arcade and duodenum.

Comparison of our findings with the available literature yielded the following differences.

1. Origin of inferior pancreaticoduodenal artery from superior mesenteric artery and upper jejunal branch of superior mesenteric artery were noted to be 78% and 4% respectively and same was reported by Oslen LL et al as 46% and 22% cases respectively. Common origin of inferior pancreaticoduodenal artery and jejunal branch of superior mesenteric artery was seen in 6% cases in present study and the same was seen to be in the range of 20-64% in the studies reviewed by Skandalakis et al.
2. Origin of anterior inferior pancreaticoduodenal artery with posterior inferior pancreaticoduodenal artery from inferior pancreaticoduodenal artery was noted to be 82% in our study; the same was seen to be 68% by Oslen LL et al and 50% by Thomford NR et al. Of these the origin of Posterior inferior pancreaticoduodenal artery only from inferior pancreaticoduodenal artery was found in 76% cases; the same was seen by Thomford NR et al in 56.66% cases.

All the arteries supplying pancreas were seen to have a variable origin, length and termination. Different studies on the arterial supply of pancreas came up with a wide range of statistical records. No one particular reason can satisfactorily explain occurrence of such variations in arteries supplying pancreas. These studies are from different region of the world.

Food type, bodily habitus, and the habitat vary from region to region leading to variation in morphology of organs associated with alimentary system and consequent rearrangement of vessels. The reason for variations being found in the same geographical region may lie in the many developmental probabilities and possibilities associated with two pancreatic buds approaching each other, enlarging and invading into a meshwork of blood vessels.

One thing that became apparent in this study was need to include a larger sample size in view of the quantum and spectrum of variations that we came across in a relatively small sample size. Study in a larger sample size was not possible due to constraints with respect to time and availability of specimens for study.

A thorough search of literature did not yield any publication related to study of arteries of pancreas from our region. This was the first attempt in our region to study and document arteries of pancreas in detail. The knowledge of the vascular anatomy of pancreatic region is an important prerequisite for planned surgical intervention. The awareness of the existing vascular anomalies enhances the insight of any region and thus the chances of successful outcome.

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