



## Study of Retropancreatic Position of Pancreatic Duct & Pancreatic Biliary Ductal Union In cadaveric Specimen

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**ABSTRACT**

Background: Ductal pattern of Pancreas is important because of its implications in various fields of Medicine. Objective: The objective is to study the Retro Pancreatic Positioning of bile duct and Pancreaticobiliary ductal union in south Indian population. Methods: A cross-sectional, descriptive study was done in the Department of Anatomy, Madurai Medical College, based on collection of 50 cadaveric specimen of male & female human pancreas. Results: In the present study 60% showed an easily accessible retropancreatic bile duct and in 40% it was not freely accessible. 84% showed a common channel and 16% showed separate opening in the duodenum for bile duct and pancreatic duct. When the common channel was measured 41% showed a channel length more than 3mm and 56% showed a channel length upto 3mm. Conclusion: The above finding is useful to the surgeons during the extraction of gall stones and in stricture surgeries to prevent post operative complication.

**KEYWORDS**

Pancreas, Pancreaticobiliary Ductal Union, Pancreatic Duct, Pancreatic Duct, Retropancreatic Position.

**INTRODUCTION**

Ductal pattern of Pancreas is important because of its implications in various fields of Medicine. It is an interesting topic for the Anatomists because most of the clinically important variations will be clearly analyzed by them under Embryological basis [10]. The knowledge about the Normal Ductal pattern as well as the congenital variations are very much important for the Surgeon according to which they can modify the surgical procedure in a more satisfactory way. This will help them to prevent most of the common post operative complications like pancreatitis. Radiological procedures like Endoscopic retrograde Pancreatography itself can leave chronic recurrent pancreatitis. More than 75% of the adenocarcinomas, which is the most common pancreatic malignancy arise from the ducts [9]. Operative loosening of proximal part of duodenum may sometimes injure the accessory pancreatic duct. In cases where the accessory duct is the main excretory route this may cause post operative pancreatitis which is an acute emergency. A patient with an obstructive lesion of main pancreatic duct either with a tumor or stone may not develop any symptom if the accessory duct is patent. As science advanced procedures like Percutaneous Pancreatography and Endoscopic Pancreatography (EPR) became widely accepted invasive techniques. Ultrasound guided Percutaneous Pancreatography with fine needle may be under taken when EPR fails to demonstrate pancreatic ducts [12]. At present Magnetic Resonance Pancreatography, a non invasive technique is very commonly being used. This is used to delineate the segments of ducts which are not evaluated by EPR [13].

Retro pancreatic position of common bile duct is clinically important because it is being often subjected to operative exploration. Pancreaticobiliary ductal union is a complex anatomical and functional entity. Anomalous Pancreaticobiliary Ductal union or common duct with more than 12mm length is reported to be associated with cystic dilation of gallbladder and carcinoma of gallbladder [8]. Common channel with more than 3mm in length is always

associated with reflux pancreatitis in a case of block. Because of the above clinical significance the topic is chosen for study.

**MATERIAL AND METHODS.** A cross-sectional, descriptive study was done in the Department of Anatomy, Madurai Medical College, based on collection of 50 cadaveric specimen of male & female human pancreas. Pancreas were removed along with the duodenum and retropancreatic part of the bile duct. Piecemeal dissection of the Specimens was done to see the pattern of pancreatic ducts and mode of their opening into the 2<sup>nd</sup> part of duodenum. Injection of air into the pancreatic duct in underwater dissection method was carried out to study the patency of the ducts. The length of the common pancreaticobiliary channel was measured.

**RESULTS:**

The total 50 specimens were studied by dissection method. The following observations were made during the study.

**Retropancreatic positioning of bile duct  
I) Accessibility of bile duct (Table No. I)**

Out of the total 50 specimens studied in this category 30 specimens showed a freely accessible bile duct in the retropancreatic position and 20 specimen showed not freely accessible bile duct (Fig 2).

**Retro pancreatic positioning of bile duct (Table No. I)**

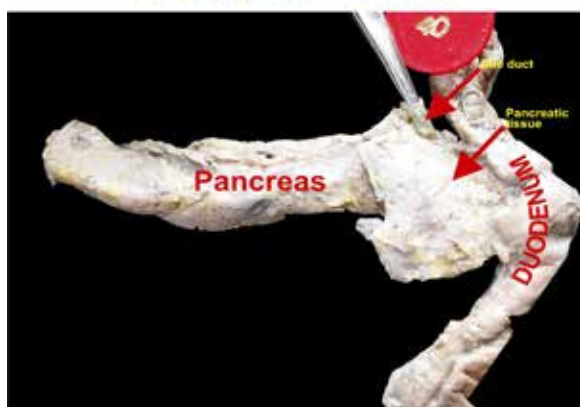
|                       |    | Percentage |
|-----------------------|----|------------|
| Specimens studied     | 50 | 100%       |
| Freely accessible     | 30 | 60%        |
| Not freely accessible | 20 | 40%        |

**Partially Freely accessible Bile duct**



**Fig 1 Partially Free Accessible Bile Duct**

**Not Freely accessible Bile duct**



**Fig 2. Not Freely Accessible Bile Duct**

**II) According to the observations the freely accessible bile duct which was noted in 30 specimens can be divided in to 2 groups (Table No.II).**

1. Completely free readily accessible retropancreatic bile duct.
2. Retropancreatic bile duct which was freely accessible but covered by a thin pancreatic tissue.

Among the thirty specimens Retropancreatic bile duct was completely free in twenty specimen i.e. group I. Ten specimens showed a thin pancreatic tissue covering the retro pancreatic bile duct i.e. group II (Fig 1).

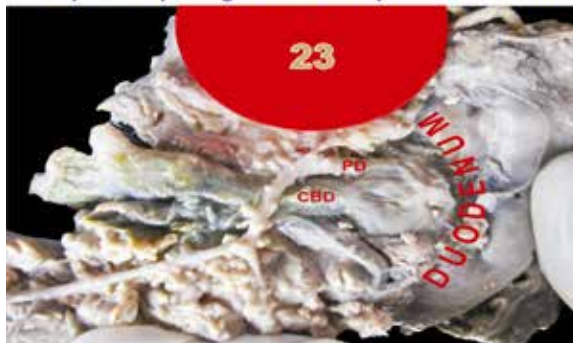
**Freely accessible retro pancreatic bile duct (Table II)**

|  |    | Percentage |
|--|----|------------|
| Specimens studied                            |    |            |
| Freely accessible retro pancreatic bile duct | 30 | 100%       |
| Completely free (Group-I)                    | 20 | 66%        |
| Covered by thin pancreatic tissue (Group-II) | 10 | 34%        |

**G) Mode of termination of common bile duct and pancreatic duct (Table No.III)**

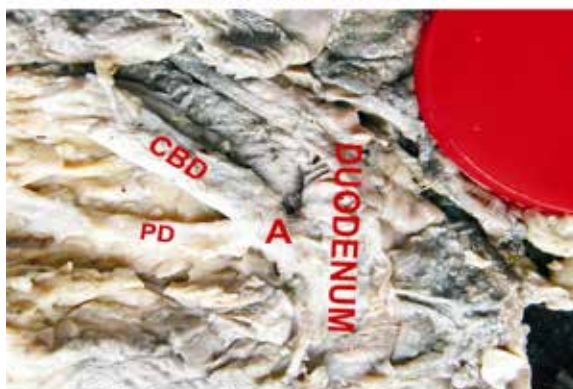
|                   |    | Percentage |
|-------------------|----|------------|
| Specimens studied | 50 | 100%       |
| Common channel    | 42 | 84%        |
| Separate openings | 8  | 16%        |

**Seperate openings of Bile and pancreatic duct**



**Fig 3 separate openings of bile and pancreatic duct**

**Common duct - 3 to 12 mm**



**Fig 4 common channel bile and pancreatic duct**

For this study only dissected specimens were used. The main pancreatic duct and the common bile duct opened through a common channel in 42 out of 50 specimens (Fig 4).

Separate openings were noted in 8 specimens out of 50 specimens constituting of total specimens (Fig 3).

**H) Length of the common channel : (Table No. IV)**

Only dissected specimens were used for measuring the length of common channel. In this study out of total 50 specimens 42 specimens showed a common channel for the bile duct and pancreatic duct. So for measuring the length of common channel only 42 specimens were taken.

The observations were tabulated in 3 groups.

The Group I is where the length of common channel was measured to a maximum of 3 mm (Fig 4). This was observed in 24 specimens.

In the Group II the length measured was more than 3mm and to a maximum of 12 mm. The length of common channel measured in 18 Specimens came under this group

From the Table No. IV it is evident that totally 18 specimens showed a common channel length of more than 3 mm length.

**Measured length of the common channel (Table No. IV)**

|  |    | Percentage |
|--|----|------------|
| Specimens studied  | 42 | 100%       |
| Length of the common channel                               |    |            |
| Upto 3 mm (Group -I)                                       | 24 | 56%        |
| More than 3mm and less than or equal to 12 mm (Group - II) | 18 | 44%        |

## DISCUSSION

Nuboer(1931) [3] reported that in 67% of cases the retropancreatic duct was easily accessible and in 33% it was not freely accessible. In study reports given by P.M.Dawson and T.G.Allen Marsh (1983) [8] they showed in 66% of cases retro pancreatic bile duct was easily accessible and in 34% it was not freely accessible. Smanio (1954) [6] in his study showed in 60% cases the retro pancreatic bile duct was being covered by a thin lamina of pancreatic tissue or only by connective tissue and so it was easily accessible. In the remaining 40% he noticed 'not freely accessible' retropancreatic bile duct. In the present study 60% showed an easily accessible retropancreatic bile duct and in 40% it was not freely accessible. So, it is evident that in 60% cases the exploration of retropancreatic bile duct is very easy in Biliary surgeries for an impacted gall stone or strictures in the bile duct.

Opie (1903) [1] noted the presence of a common channel in 89% and separate openings in 11%. Cameron (1924) [2] and Nuboer (1931) [3] showed the presence of common channel in 76% and separate openings in 19% and in the remaining specimens main duct reduced to a fibrous strand. Howard J and Jones,R. (1947) [5] in his study result quoted a percentage of 86 for the common channel and 14% for the separate openings. According to the present study results 84% of the specimens had a common channel for biliary and pancreatic output and 16% showed separate openings.

Terumi Kamisawa (2004) [15], in his study noted the presence of common channel in 67% and in separate openings in 33%. In a study conducted by Ronald A.Bergman (2001) [14] he showed that 63% of specimens had a common channel for bile and pancreatic ducts and 30% showed separate openings. These results are not coinciding with present study results. The Common Channel formed by the union of main pancreatic duct and common bile duct was measured and depending upon the length of the channel, specimens were grouped into 3 categories. In the present study 24 specimens (56%) showed a common channel with the length less than or equal to 3 mm. All the other 18 specimens (4%) with a common channel showed a length more than 3 mm. According to Reinhoff and Pickrell (1945) [4] Bruce, Valmikey and Ross (1979) [7] an ampulla cannot be described when the common channel length is less than 3mm. So in the present study group only in 18 specimens ampulla can be defined. The people with a long common channel is prone for reflux pancreatitis when there is an obstructive lesion in the common channel either due to tumor or stone.

## CONCLUSION:

The bile duct was freely accessible in retro pancreatic position in 60% cases and was deeply buried in the pancreatic tissue in 40% cases. The above finding is useful to the surgeons during the extraction of gall stones and in stricture surgeries. 84% of specimens showed a common channel and 16% of specimens showed separate opening in the duodenum for bile duct and pancreatic duct. When the common channel was measured 34% of specimens showed a channel length more than 3mm and 48% of specimens showed a channel length upto 3mm. This study results show that almost half of the people with common channel of more than 3mm are at high risk for reflux pancreatitis.

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