Double common bile duct

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Introduction

A rare congenital anomaly in which two common bile ducts exist is known as double common bile duct (DCBD). One usually has normal drainage into the duodenum and the other usually named accessory common bile duct (ACBD) opens in to a different part of the upper gastrointestinal tract (stomach, duodenum, ductuspancreaticus or septum in the common bile duct). The first description of this rare congenital anomaly in a male cadaver was by Vesalius in 1543 [1].

Case

A 70 year old male presented to the surgical clinic with a history of on and off pain in the right upper quadrant of the abdomen which radiated to the back for the last 7-8 months. Pain was aggravated by eating fatty food. There was no history of vomiting, jaundice or fever during these attacks. General examination was unremarkable with no evidence of pallor or jaundice. Abdominal examination showed tenderness over the right hypochondrium. Routine haematological examination showed a haemoglobin 1of 1.6gm/dl, total leukocyte count of 14000/mm3 with differential leukocyte count showing 86% neutrophils. Renal function tests were within normal limit. Liver function test showed total bilirubin of 2.6mg/dl with direct bilirubin of 1.8mg/dl, serum glutamic pyruvic transaminase (SGPT) of 40µkat/L, serum glutamic oxaloacetic transaminase (SGOT) of 35IU/L and serum alkaline phosphatase (ALP) of 250 IU/L. Ultrasonography of the abdomen was done which showed chlolelithiasis with cholecystitis. Common bile duct was normal.

Open cholecystectomy with per operative needle cholangiogram was planned before exploring the biliary tract for suspected choledocholithiasis. Per operative cholangiogram showed a double common bile duct with the accessory bile duct opening into the second part of

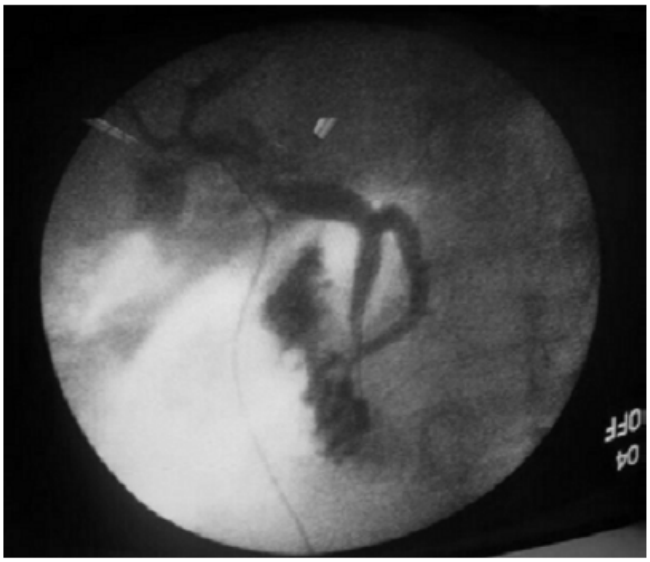

Figure 1. Per operative cholangiogram showing a double common bile duct with the accessory bile duct opening into the second part of duodenum via the common ampulla of vater.

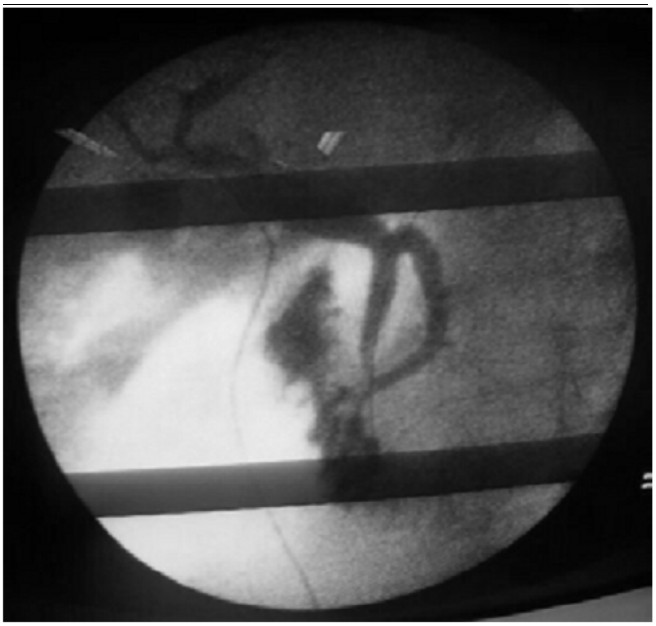

Figure 2. Per operative cholangiogram showing a double common bile duct.

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the duodenum via the common ampulla of vater as the main duct. No stones were detected in the biliary tree. Choledochotomy which had been planned earlier was abandoned. (Figure 1 and Figure 2). Patient had an uneventful post operative recovery.

Discussion

Double common bile duct is a very rare anomaly in the western world, since Teilum identified only 24 cases in western literature until 1986 while Yamashita reviewing Japanese literature from 1968 to 2002 and found 47 patients with this anomaly. The first case detected on ERCP was reported by Y. Horsmans in 1966. The ratio of male to female is approximately 1:1.6.[2,3,4]

The pathogenicity of this congenital abnormality may be a result of inadequate or abnormal recanalisation of the common bile duct or real duplication due to the presence of double anlage. The embryonic development of the liver, gallbladder system and biliary tree starts around the third week of gestation, when the primodial liver, designated as the hepatic diverticulum, is formed as an outgrowth of the endoderm in the distal part of the anterior foregut. As the hepatic diverticulum grows, its cells penetrate the mesenchyma of the ventral mesogastrium, dividing into a ventral and a dorsal bud. The primitive gallbladder is formed from the ventral bud (pars cystica). The dorsal bud (pars hepatica) divides in turn to the left and right liver lobe. As the liver and biliary tree develops inseparably, the stem of the hepatic primordium becomes the bile duct. The definite lumen of the bile tree is developed by recanalisation of the epithelium. The anomalies of biliary tree drainage may be due to the disruption of the diverticulum hepaticum. [5,6,7] On reviewing the literature a series of confusing and contradictory embrolological classification based on the anatomical appearance of the entity have been reported by different authors. No clinical significance was attributed to these anatomical classifications. Finally, this anomaly is classified with regard to the point of drainage of the accessory common bile duct by Yamashita et al in 2002. According to Yamashita based on the incidence of ectopic opening of the accessory common bile duct the classification of positions are stomach; second part of the duodenum; first part of the duodenum and the main pancreatic duct. Based upon the Yamashita 2002 classification lots of clinical conditions were associated with this rare entity. Gastric cancer has been reported in patients with accessory common bile duct (ACBD) opening in the stomach where as gallbladder cancer and ampullary cancer is associated with ACBD openings in the second portion of the duodenum and pancreatic duct. [3,8,9] Double common bile duct has been described in co-existence with multiple diverticuli of the first portion of the duodenum, absence of the gall-bladder, congenital duodenal obstruction and annular pancreas, anomaly of pancreatic and common bile duct junction, congenital biliary atresia of extrahepaticbile ducts, congenital cysts of the non-ectopic common bile duct and cholangiocarcinoma in the duplicated bile duct. Gall bladder carcinoma and cholangiocarcinoma of extrahepatic biliary tree are also reported in association with this entity. [3,10,11,12,13] Common bile duct duplication can clinically manifest as ascholangitis, pancreatitis, cholecystitis or hepatic abscess as a result of reflux of pancreatic or intestinal content in to the common bile duct. Precise preoperative recognition of this anomaly is very difficult but can prevent surgeons from impairing this anomalous bile duct sometimes discovered at operation accidentally. Magnetic resonance cholangiography as well as ERCP could reveal the existence of this anomaly preoperatively. [3,14] Treatment of double common bile duct depends on the co-existence of anomalous pancreaticobiliary junction in which the pancreatic and biliary ducts are joined outside the duodenal wall forming a long common channel and concomitant gastric or biliary system cancer. In cases without cancer, the resection of accessory common bile duct is recommended. When anomalous pancreaticobiliary junction is present, the separation of the flow of bile and pancreatic juice into the gastrointestinal tract should also be performed to prevent cancer in the biliary system. [15,16]

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Key points:

- Double common bile duct is a rare entity which is very difficult to diagnose clinically and may present with nonspecific symptoms.
- Management depends on the existence of anomalous pancreaticobiliary junction or concomitant gastric or biliary system cancer.