Summary

The Injury to the common bile duct during cholecystectomy is usually the result of distorsion or tenting of the common bile duct by traction applied to the cystic duct .

The common bile duct is likely to be injured when the gall-bladder is small, fibrotic, and partly calcified , and it lies in the hilus of the liver, also in some cases as acute cholecystitis in which the ducts are obscured by dense, felt-like adhesions .

Injuries to the common bile duct may also occur during colonic, pancreatic, duodenal and gastric operations .

About 90 percent of the common bile duct operative injuries followed cholecystectomy , 5 per cent followed choledochostomy , 3 percent followed partial gastrectomy and 2 percent caused by other operations on the choledochus, duodenum and pancreas .

Congenital anomalies are predisposing factors to C.B.D. injury, such amomlies may be in the billiary tract or blood vessels feeding the biliary tract or the liver .

The surgeon must be familiar with these variations . Blind grab to arrest haemorrhage occurring from the cystic artery, an anomalous cystic artery or right hepatic artery is one of the most common causes of injury to the the common bile duct .

Many cases of postoperative strictures of the common bile duct are due to destruction of the duct by necrotizing effect of bile . Biliary leakage may be due to :

1- Slipped cystic duct ligature .

2- Early withdrawal or displacement of T-tube .

3- Unrecognized severence of an accessory hepatic duct .

In the early postoperative period, a persistant discharge of bile in large amount through the wound or through the drainage tube will indicate open injury . A rapid developing obstructive jaundice implies a ligated duct .

Later features as intermittent or progressive jaundice, with or without cholangitis, may present at any time up to several years . Secondary biliary cirrhosis and manifestations of portal hypertension are common in long standing benign bile duct strictures .

Laboratory and radiological examination are essential to demonstrate the degree, site and extent of the injury and concomitant stricture .

The bilirubin level may be elevated only marginally and in incomplete and intermittent obstruction . Repeated serum estimations may be necessary to detect an elevated level .

The serum alkaline phosphatase level is usually high and it is the most frequently used biochemical test of bile duct patency .

Percutaneous transhepatic cholangiography is without doubt, the best mean of demonstrating the exact site and extent of the stricture , having the advantage that it can demonstrate the hepatic side of the stricture and the intrahepatic biliary tree .

Endoscopic retrograde cholangiopancreatography is of value in demonstrating incomplete strictures and distal stricture when simultaneous visualization of the pancreatic duct is required .

Ultrasonography is the basic screening investigation in the initial evaluation of patients with obstructive jaundice . The use of ultrasonography or computed tomography , percutaneous transhepatic cholangiography and endoscopic retrograde cholangiopancreatography should be successful in imaging the level and extent of the strictures in nearly all cases .

HIDA scanning may be of value in the assessment of bile duct strictures and is of special value during follow up of patients after surgical repair as it can demonstrate anastomotic patency and function .

If duct injury is recognized during operation, reconstruction of the duct should be immediately performed . The type of repair will depend upon the severity and site of the damage , satisfactory results can be obtained by suturing the common bile duct and splinting with a T-tube where the lesion is partial and detected in the course of surgery . Complete sections of the common bile duct are treated either by direct suturing of the choledochus or with a biliodigestive anastomosis (choledochojejunostomy-Roux-en-y) or (choledocho-duodenostomy) .

Early complications of the common bile duct injury include biliary peritonitis , subhepatic accumulation and intraabdominal

abscess . Late complications include biliary fistula and strictures of the common bile duct .

Post operative strictures of the common bile duct account for 90 to 95 percent of all of the so called benign strictures of these ducts. If primary sclerosing choledochitis and fibrosis of sphincter of Oddi are excluded,benign strictures of the common bile duct are almost always the result of surgical injury.

The surgical treatment of these patients is associated with an increased risk of peroperative and post operative complications including ; hepatorenal failure, gastrointestinal haemorrhage , dissiminated intravascular coagulation and wound dehiscence . Most of these complications may be related to the systemic endotoxaemia frequently occurring in obstructive jaundice . Several measures may be tried to reduce the systemic endoxaemia and so that risk of post operative complications, as oral bile salts therapy and lactulose . Preoperative external biliary drainage may have a role in improvement of liver function and decrease the risk of postoperative septic complications and renal failure . Mannitol infusion may have a role in stabilisation of renal function and prevention of postoperative renal failure . Haemodialysis has a defenitive role in treatment of hepatorenal failure associated with obstructive jaundice .

More than 90 percent of cases of benign biliary strictures can be treated by surgical reconstruction of the biliary enteric continuity .

Roux-en-y hepaticojejunostomy is the ideal procedure, however, choledochoduodenostomy can be done in distal strictures .

In high hilar strictures, the left hepatic duct can be approached for anastomosis by opening the umbilical fissure and lowering the hilar plate , or by dissection at the base of ligamentum teres . Mucosal graft technique and left hepaticojejunostomy by Longmire Sanford technique have only limited indications .

The type of repair used for treatment of common bile duct strictures could be classified as follows :

(1) Repair of low common bile duct stricture :

A) Biliary intestinal anastomosis for low common bile duct stricture :

1- Choledochoduodenostomy .

2- choledochojejunostomy .

3- Cholecystoanastomosis if the gall-bladder is present .

B) Correction of stenosis at the level of sphincter of oddi :

1- Sphincteroplasty .

2- Sphicterotomy .

C) Dilatation .

(2) Repair of high common bile duct stricture :

a- End to end anastomosis .

b- Dragstedt's technique .

c- Plasticrepair .

(3) Biliary intestinal anastomosis for stricture extending to the common hepatic duct :

a- Hepaticoduodenostomy .

b- Hepaticoduodenostomy with partial gastric ressection .

c- Hepaticojejunostomy (Roux-en-y) .

(4) Biliary intestinal anastomosis for stricture extending to the hilus :

a- Hepaticojejunostomy (Roux-en-y) with mucosal graft, using unexchangeable transhepatic tube (one end of the tube is exterior) . Rodney Smith operation .

b- Hepaticojejunostomy with mucosal graft, in form of :

i) Roux-en-y or .

ii) A loop with a side to side entero-entero-stomy . Using exchangeable transhepatic tube (Both ends of the tube are exterior) .

(5) Biliary intestinal anastomosis for stricture extending to the intrahepatic ducts :

The Longmire operation .

(6) Less efficient Biliary drainage technique :

Percutaneous transhepatic biliary drainage .

Endoscopic and percutaneous transhepatic balloon dilatation and insertion of endoprosthesis may be performed in selected high risk patients , especially in the presence of portal hypertension . However, the non operative approaches should be used with caution since incomplete decompression of the biliary tree may be associated with progressive liver damage . Radiological interventional approaches may be used in an adjunctive manner with surgical repair

in selected cases, using either a percutaneous approach or the introduction of catheters along surgically established tubal tract .

The prognosis following reconstructive procedures for postoperative bile duct strictures depend mainly on the following factors :

1- The anatomical site of the stricture and the length and caliber of the remaining proximal portion of the duct .

2- The dgree of scarring, cholangitis and pericholedochitis present .

3- The number of previous repair procedures and the interval between injury and surgical reconstruction .

4- Hepatic function : The presence or absence of cirrhosis of the liver; and the general condition of the patient .

The adequacy of the operative repair is of great importance in determining the ultimate long term prognosis , and the best results are obtained by a good initial repair .

The postoperative morbidity of reconstructive operations for bile duct strictures is high . At least one patient out of ten is likely to have one or more major complications . operative mortality is reported as between 5 and 8 percent .